SUBCOURSE
SS0529

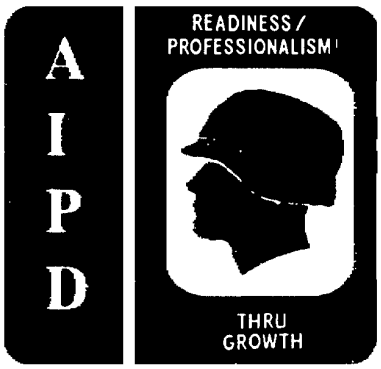
EDITION
A

PREPARE OVERLAYS

EDITION DATE: SEPTEMBER 1994

THE ARMY INSTITUTE FOR PROFESSIONAL DEVELOPMENT

ARMY CORRESPONDENCE COURSE PROGRAM



PREPARE OVERLAYS

Subcourse Number SS 0529

EDITION A

United States Army Signal Center and School
Fort Gordon, GA 30905-5074

5 Credit Hours

Edition Date: September 1994

SUBCOURSE OVERVIEW

This subcourse presents the methods and procedures for preparing map overlays and viewgraph transparency overlays. You learn the standard symbols used for creating concise, yet informative graphics. You will also learn the procedures for producing diazo-processed transparencies used for overhead projection.

There are no prerequisites for this subcourse.

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 publications.

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

TERMINAL LEARNING OBJECTIVE

ACTION: You will learn to create map overlays, using the Army's standard symbols to provide clear and concise information to field commanders. You will also learn the methods for producing viewgraph overlays used for overhead projection. You will learn to create the overlay masters and develop them using the diazo process.

CONDITION: You will be given information and an attached extract from FM 101-5-1; STP 11-25M13-SM-TG; and NAVEDTRA 10472.

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

TABLE OF CONTENTS

LESSON 1

PREPARE MAP OVERLAYS

Critical Task: 113-579-5060

OVERVIEW

LESSON DESCRIPTION:

In this lesson you will learn to identify the methods and components used to prepare map overlays. This includes the procedures for orientation, use of standard symbols, and adding marginal information. You also will learn the techniques used to construct the overlay. In lesson 2 of this subcourse you will learn the procedures for preparing viewgraph overlays.

TERMINAL LEARNING OBJECTIVE:

ACTIONS:
a. Explain the methods and components used to prepare a map overlay.
b. Identify the operational symbols used in conjunction with map overlays.
c. Describe the techniques used for preparing an accurate and informative map overlay.

CONDITION: You will be given information and an extract from FM 101-5-1, and information from STP 11-25M13-SM-TG.

STANDARD: You will explain the methods, components, and techniques of map overlays, and identify the standard symbols in accordance with FM 101-5-1 and STP 11-25M13-SM-TG.

REFERENCES: The material contained in this lesson was derived from the following publications: FM 101-5-1 and STP 11-25M13-SM-TG.

INTRODUCTION

As a Multimedia Illustrator, MOS 25M, one of your more challenging tasks will be that of preparing overlays for visual presentations. Your ability to create effective overlays makes the difference between successfully communicating important messages, or presenting unorganized, confusing, or incorrect data.

There are three types of overlays you may be called upon to create: overlays for camera-ready mechanicals (CRMs), overlays for viewgraph transparencies (VGTs), and map overlays. This subcourse covers the procedures you use to prepare map overlays and VGT overlays.

You use overlays to aid in presenting plans, ideas, battlefield representations, and proposals to the commander. The quality of your product enhances or deters the decision-making process. Make your overlays a reliable illustrative tool, capable of communicating the necessary ideas and messages needed for your unit's mission accomplishment.

This lesson introduces you to the methods and components of preparing map overlays. We identify the symbols used to make the process more clear and concise. We then discuss the techniques you use to prepare your map overlay. Lesson 2 of this subcourse covers the procedures used for preparing overlays for viewgraphs.

PART A - IDENTIFY METHODS AND COMPONENTS OF MAP OVERLAYS

As a graphics documentation specialist operating in a field/combat environment, you face many challenges. You must meet the graphic needs of your unit despite often not having the correct equipment, operating in adverse weather conditions, and most always with little time available.

As your unit's graphics specialist, you must create accurate map overlays showing routes of traffic and overlays that support decision making and briefings. When deployed, you create situation overlays that show troop movements and locations, both friendly and enemy. Your accuracy in preparing this information is critical to your unit's survival.

1. General.

An overlay is a transparent or translucent medium upon which you plot special information superimposed on a map, photograph, or other graphic used as a base of reference. When using map over-lays, the overlay must use the same scale as that used on the map. This allows the details on the overlay to appear in their true position with respect to the base.

2. Preparing a Map Overlay.

There are three basic steps in the preparation of a map overlay. The three steps are orientation of the overlay material, plotting and symbolization of details, and the addition of any required marginal information.

a. Material Orientation. You must first assess the requirements of the requested task. Ideally, the request will be defined on a Visual Information (VI) Work Order Department of the Army (DA) Form 3903-R. Check the work order form to determine what you need to complete the project. Figure 1-1 illustrates a sample DA Form 3903-R.

VISUAL INFORMATION (VI) WORK ORDER
For use of this form, see AR 25-1, the proponent agency is ODISC4

1. WORK ORDER NUMBER: 3/90-217
2. SECURITY CLASSIFICATION: UNCLASSIFIED

SECTION I - REQUIREMENT

3. TO (VI Activity): DET. 2 15th VI BN, (COM-DOC) Ft Lowry, CO. 80230-5000

4. FROM (Unit or Activity): B. Co. 560th SIG BN Ft Lowry, CO. 80230-5000

5. ACCOUNT NO: 1234-567-890

6a. REQUESTOR (Name): J.Q. Walton
b. GRADE: O-3
c. PHONE NO: 2099/3333
7. DATE REQUESTED: 27 FEB 99

8. ALTERNATE POC: Cal M. Stedman
9. DATE REQUIRED: 30 MAR 99

10a. DESCRIPTION OF WORK (Attach diagrams, etc, and list enclosure(s)): 18 multicolor high quality VGTs as per attached examples. Full color unit crest and title area will be standard on all 560th high quality VGTs.

b. CHECK APPLICABLE BOX

(1) Still Photo	
(2) Graphic Art	X
(3) TV	
(4) Audio	
(5) Motion Picture	
(6) Presentation Service	
(7) Other (Specify)	

NOTE: SECTION 1, BLOCKS 3 THROUGH 12, ARE FILLED OUT BY THE REQUESTOR. BLOCKS 1 AND 2, AND SECTION II, BLOCKS 13 THROUGH 18b, ARE FILLED OUT BY THE SUPERVISOR OF THE VI FACILITY.

11. JUSTIFICATION FOR REQUESTED SERVICE: 15 APRIL IN-BRIEFING FOR THE NEW BN COMMANDER.

12. Requested service is for official purposes and is required by stated deadline.
VALIDATION SIGNATURE: Charles P. Yancey

SECTION II - WORK RECEIPT (Sections II Through VIII for VI Activity Use Only)

13. ITEM SERVICE	14. SIZE	15. AMOUNT	16. DATE COMPLETED

17. CUSTOMER NOTIFIED (Date) | 18a. RECEIVED BY (Signature) | b. DATE

DA FORM 3903-R, AUG 88 — DA FORM 3903-R, SEP 78 IS OBSOLETE

Figure 1-1. VI work order DA Form 3903-R (front)

SECTION III - JOB ASSIGNMENT

19. DATE RECEIVED	20. DATE ASSIGNED	21. JOB APPROVAL (Signature)
27 FEB 99	27 FEB 99	L. G. Jones

22. SPECIAL INSTRUCTIONS

TOUCH UP MASTERS FOR UNIT CRESTS AS NEEDED

23. WORK AREA	24. WORK TO BE PERFORMED	25. START	26. COMPLETE	27. WORKHOURS	28. SUPERVISOR
GRAPHICS	18 COLOR UGTs	0700	1700	9	LAB

SECTION IV - SUPPLIES

29. DESCRIPTION	30. TOTAL COST
72 DIAZO FOILS	
18 VGT FRAMES	

SECTION V - CONTRACT SERVICES

31. ITEM DESCRIPTION	32. COST

SECTION VI - MANAGEMENT REPORT DATA

33. VI ACTIVITY NAME	34. DVIAN	35. FY	36. WORK ORDER NO.	37. FUNCTIONAL AREA SUPPORTED

TYPE OF SERVICE	a. IN HOUSE			b. CONTRACT		c. OVERHEAD		
	(1) WORK HOURS	(2) PRODUCTS MINUTES/ITEMS	(3) COSTS	(4) COSTS	(5) PRODUCTS MINUTES/ITEMS	(6) WORK HOURS	(7) PRODUCTS	(8) COSTS
38. Still Photo								
39. Graphic Art								
40. Audio								
41. Video								
42. Motion Picture								
43. Other								

44a. REQUESTING COMMAND	b. ACCOUNT NO.	c. TOTAL WORK ORDER COST

SECTION VII - DISPOSITION

45a. DISPOSITION OF ORIGINAL VI MATERIAL	b. DATE

REVERSE OF FORM 3903-R, AUG 88

Figure 1-1 (cont.). VI work order DA Form 3903-R (back)

Once you know what you need, gather your materials (correct map sections, tracing paper, pencils, tape, etc.).

To orient your overlay material, place it over the map area you want to annotate, and, if possible, tape it temporarily to the map. You now trace the grid intersections nearest the two

opposite corners of the overlay and label each with the proper grid coordinates (see figure 1-2).

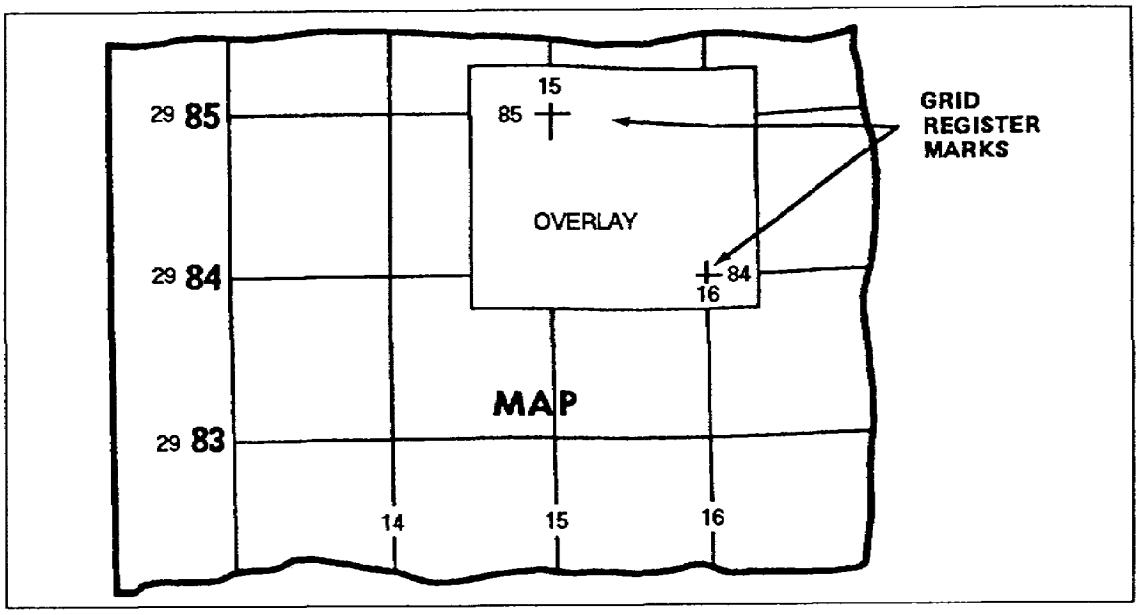


Figure 1-2. Marking overlay registration marks

The grid registration marks show the receiver of the overlay exactly where it fits on his map. Without them, he will have difficulty in orienting your overlay on his map. You must include at least two grid registration marks, and they must include the grid identifiers (coordinates).

b. Plotting and Symbolization. Plotting and symbolization of the details are essential. When plotting, use standard color pencils or markers where possible. Otherwise plot the activities or information with a pen or pencil that makes a lasting mark without cutting your overlay material.

(1) Use standard symbols. Use standard topographic or military symbols whenever possible. You must annotate nonstandard symbols in the legend of the overlay. Since overlays supplement orders and reports, the recipient has the identical map. Therefore, you need only show the detail directly concerned with the report. To assist you in keeping your overlays clear and concise, the Army uses a set of standard military symbols. The Army developed this set of symbols from the North Atlantic Treaty Organization (NATO) Standardization Agreement (STANAG) 2019. Appendix B of this subcourse is a comprehensive description of the standard system for military symbols.

(2) What a military symbol is. Military symbols are graphic aids that accurately identify items of operational interest. A military symbol is a sign composed of a diagram, number, letter, abbreviation, color, or any combination thereof. These symbols identify and/or distinguish a particular military unit, activity, or installation. Avoid departing from using these standard symbols whenever possible. When you must improvise a nonstandard symbol, annotate its meaning in the accompanying legend.

(3) Keep to good military symbology. Military symbols lose their value if they become complicated or cluttered with unnecessary detail. Remember that simplicity, uniformity, and clarity are the keys to good military symbology. The following paragraphs briefly summarize the identification of military symbols. The page numbers indicated in parenthesis () refer to the appropriate page in appendix B. If you have need for more detailed descriptions of these symbols and their use, refer to appendix B.

(4) Kinds of symbols. Military symbols usually consist of:

(a) Basic and interservice symbols (App B, p B-6). Geometric figures form the basic symbols to represent units, installations, and activities. Figure 1-3 shows examples of some basic symbols.

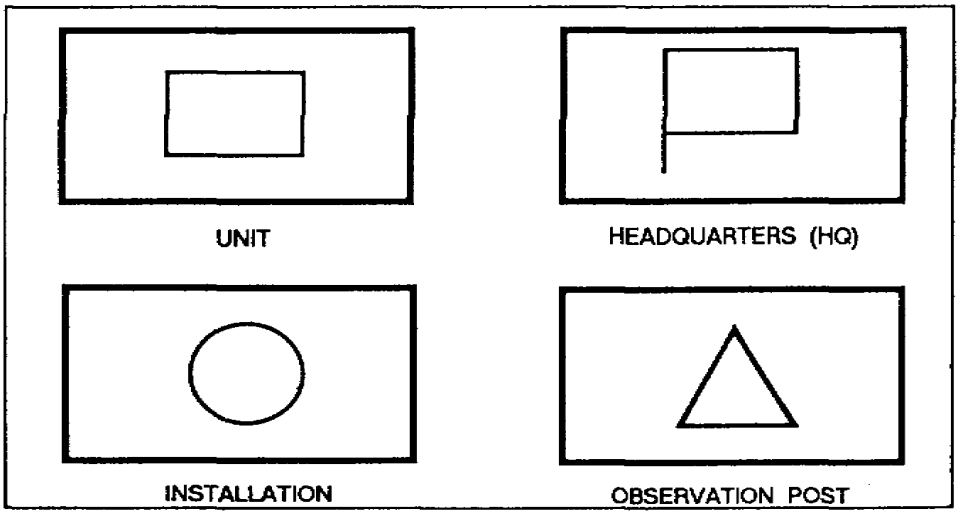


Figure 1-3. Basic and interservice symbols

(b) Service markings. For interservice use, the Army, Air Force, Navy, and Marine Corps each have distinctive markings (App B, p B-7). Figure 1-4 shows the service designator for each service. Note that the military symbols referring to Army units have no special designator.

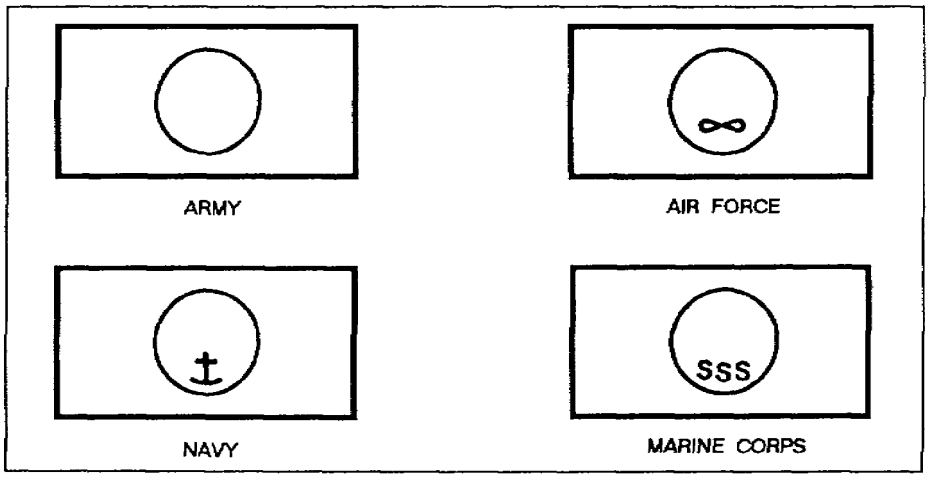


Figure 1-4. Service designator symbols

(c) Unit size symbol (App B, p B-8). You show the size of units or installations by placing the appropriate size indicator directly above the basic symbol. Figure 1-5 shows examples of units with their size indicator affixed.

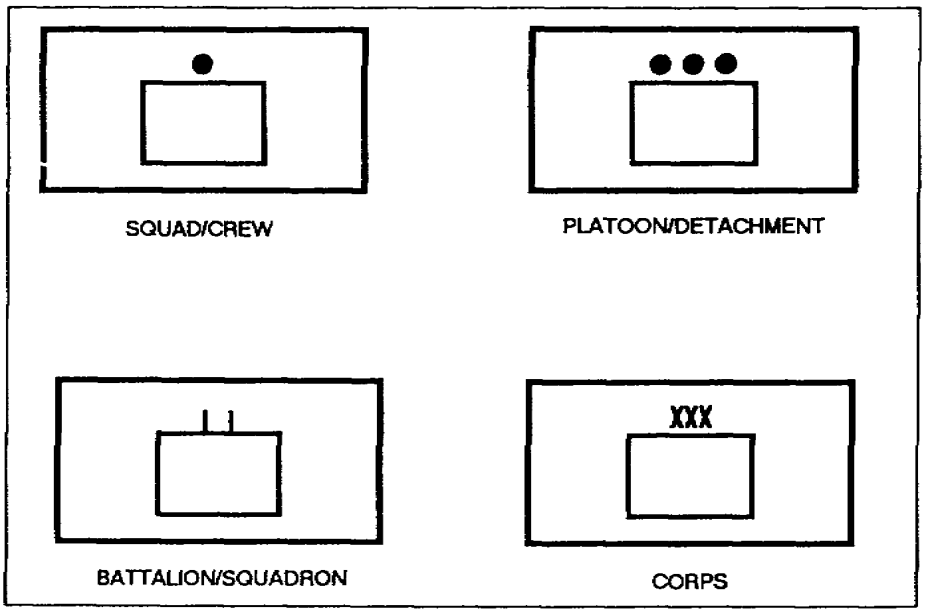


Figure 1-5. Unit size indicators

(d) Unit role indicators (App B, p B-9). You place branch or functional role indicators inside the basic symbol. More than one role indicator may appear within the basic symbol to denote its exact function. Figure 1-6 illustrates some examples of unit role indicators.

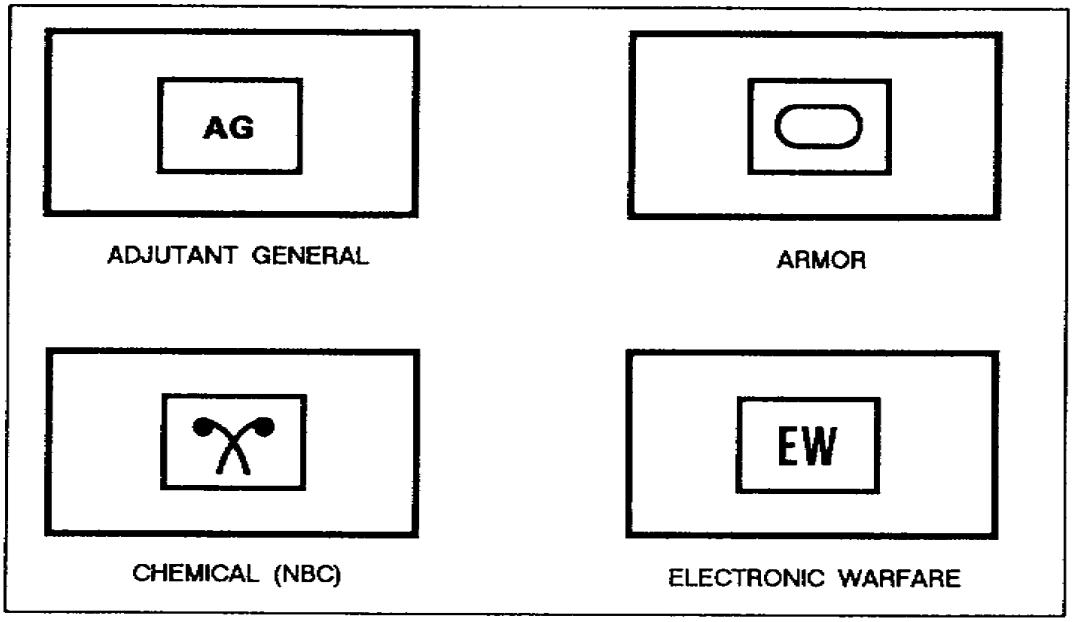


Figure 1-6. Unit role indicators

(e) Installation role indicators (App B, p B-16). Installation role indicators are similar in purpose as unit role indicators except that they apply to installations vice units. Figure 1-7 shows examples of installation role indicators.

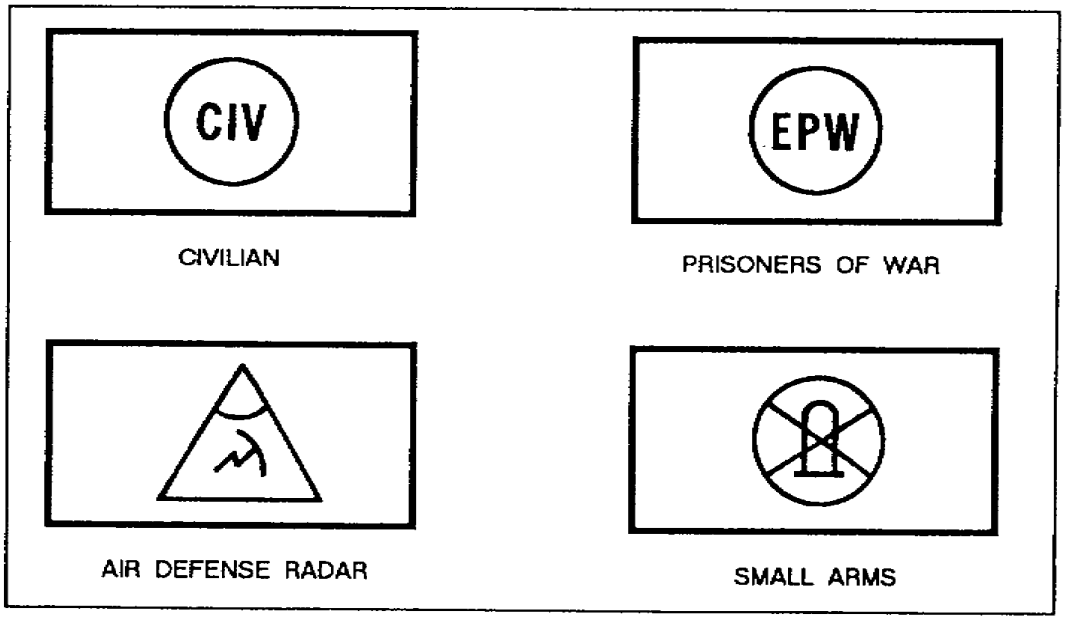


Figure 1-7. Installation role indicators

(f) Equipment indicators (App B, p B-22). You use equipment indicators to show the type and location of equipment deployed.

- You use weapons symbols on your map overlay to indicate the type, size, and location of the particular weapon. The base of the symbol indicates the exact location (App B, p B-22).

- You indicate vehicles (except armored) by combining two types of symbols: one for the body type, the other for the means of mobility. Refer to appendix B, page B-25, for an example of a vehicle symbol. Notice that the body type symbol is in the top position and the mobility symbol is in the bottom position.

(g) Aviation symbols (App B, p B-26). You use aircraft symbols to indicate the location and type of aircraft. Figure 1-8 shows examples of Army and Air Force aircraft. Note the difference in the symbols used for Army and Air Force.

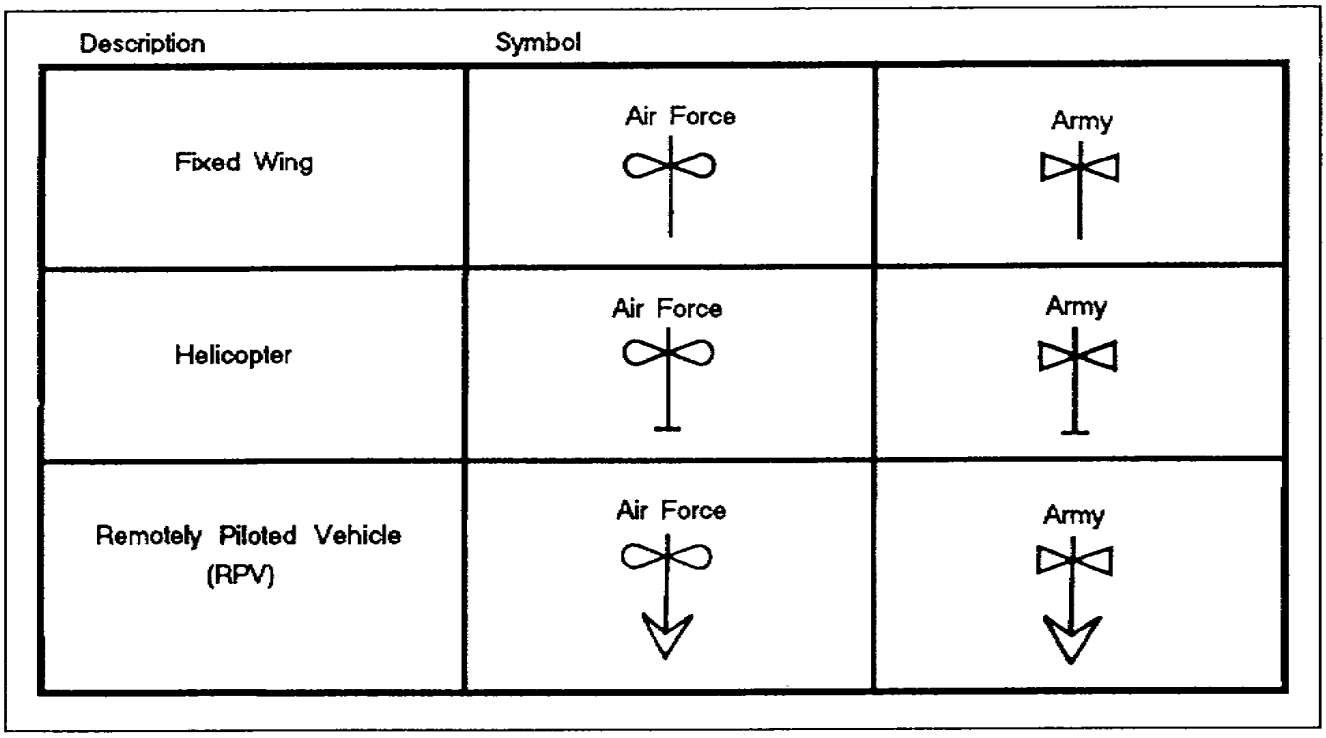


Figure 1-8. Aviation symbols

(h) Communications and Electronics (C-E) Emitter Symbols (App B, p B-28). You use C-E symbols to indicate the location and types of electromagnetic emissions. Figure 1-9 illustrates some examples of C-E emitter symbols.

NOTE: Not all components must be used. Remember to keep your overlays as simple as possible.

You use these military symbols in conjunction with all types of situation maps and overlays, field sketches and overlays, arterial photography, and organizational charts.

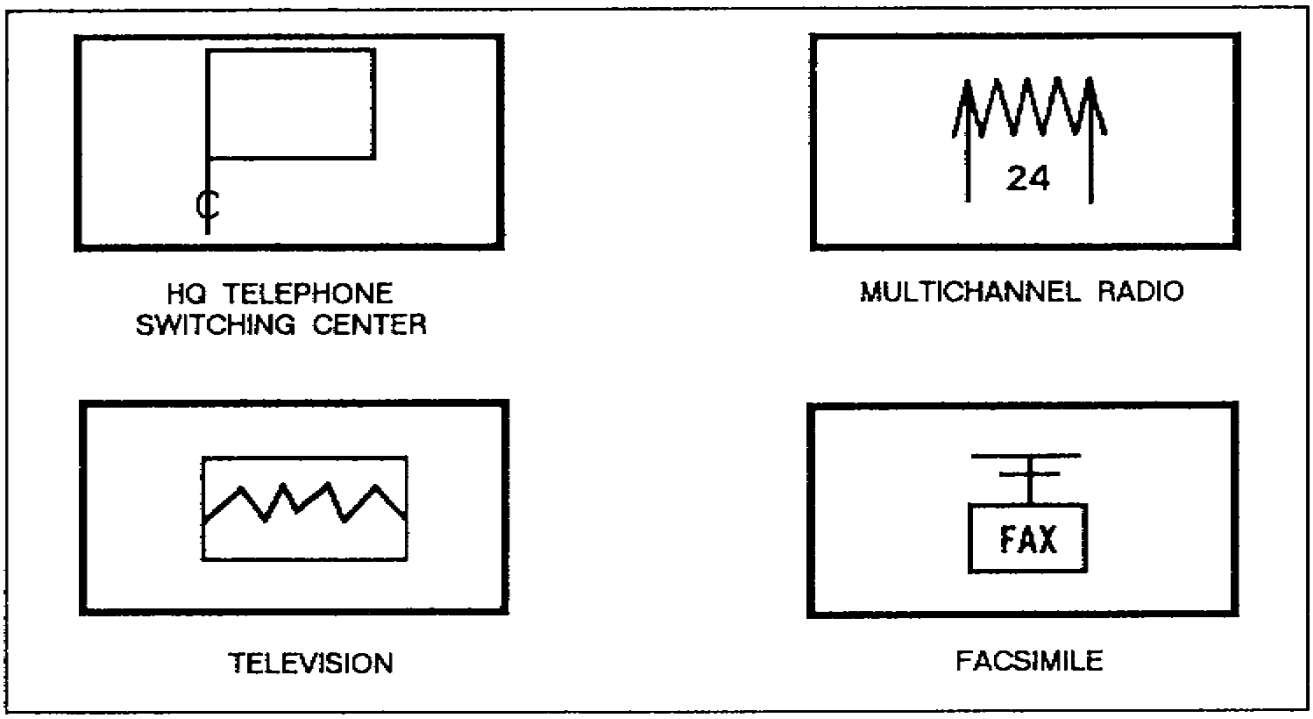


Figure 1-9. C-E emitter symbols

c. Marginal Information. The addition of marginal information on your overlay is important. When you complete plotting or tracing all required information on your overlay, you print the marginal information as close to the lower right-hand corner as possible. The marginal information may include the following (see figure 1-10).

(1) Classification. The security classification must correspond to the highest classification of the map or the information contained on the overlay. If unclassified, so state.

NOTE: The classification also must be placed at the top center and the bottom center of the overlay.

(2) Title. The title tells the reader the purpose or objective of the overlay.

(3) Time and date. Your overlays should contain the latest information when you prepare it. It is important for the receivers to know the exact time of preparation in order to determine its reliability and usefulness.

(4) Map reference. The map reference should include the sheet name, sheet number, map series number, and the scale of the applicable map.

(5) Legend. You use a legend only when the situation requires you to include nonstandard symbols on your overlay.

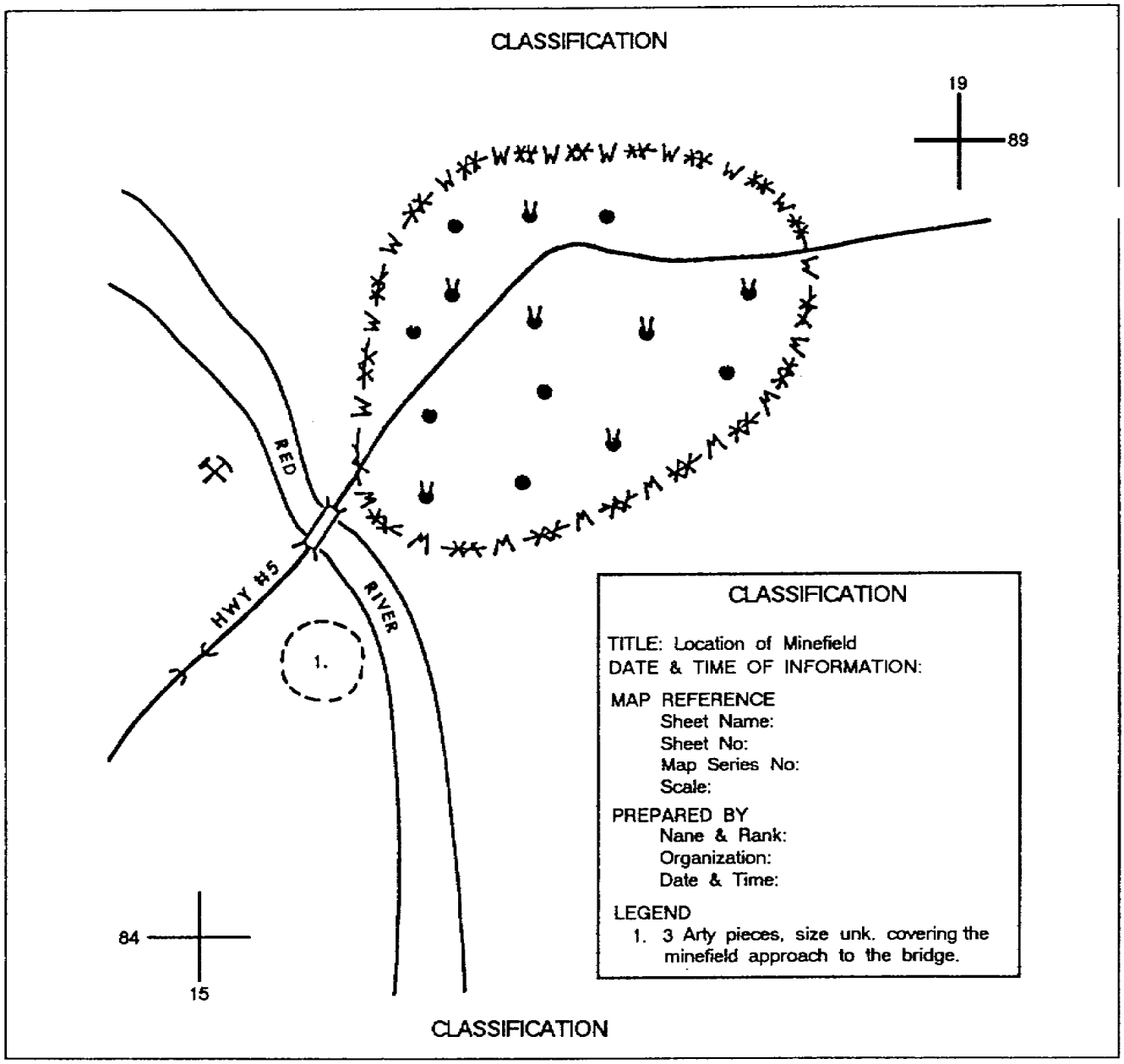


Figure 1-10. Map overlay with marginal information

(6) Additional information. Include any additional information that amplifies the information on the overlay. Again, make this information as brief and simple as possible.

PART B - MAP OVERLAY TECHNIQUES

Situation maps and overlays provide commanders and their staff with a rapid and easily understood means to express operational plans, concepts, or situations. The combination of the symbols identified in part A of this lesson, and the objectives, boundaries, routes and other measures identified in this part of the lesson, creates an indispensable tool for a quick and accurate portrayal of the battle activity. To relay this tactical information without confusion requires standardization of techniques.

This part of the lesson establishes guidelines for the pictorial representations of these tactical situations.

3. Use of Color.

Ideally, you use different colors to depict enemy and friendly symbols. However, since you may not always have different colors at your disposal, you may use a single line to denote friendly symbols, and double lines to indicate enemy symbols. Figure 1-11 illustrates an example of single-color symbols that show friendly and enemy front lines.

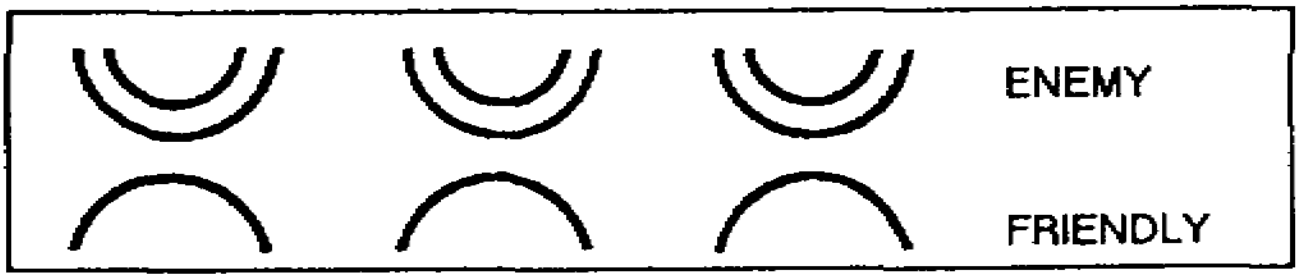


Figure 1-11. Single-color symbols

When you have multicolors available, the following colors denote information as indicated:

a. Blue or Black. Blue or black indicates friendly units, posts, installations, equipment, etc., not covered by other colors.

b. Red. Red indicates enemy configurations not covered by other colors.

c. Yellow. Yellow indicates friendly OR enemy chemical, biological, or radiological areas.

d. Green. Green indicates friendly OR enemy man-made obstacles or obstructions.

If you use other colors than those above, you must explain their use and meaning in the accompanying legend.

NOTE: When overlays are transmitted by facsimile, only black and white are possible. Use the abbreviation EN to indicate enemy locations.

4. Use of Fields.

A field is a designated area around a basic symbol that you use to display a particular item of information. This information may be another symbol (such as a size indicator), words, or letters.

Some fields only apply to friendly forces; others only apply to enemy forces. You position the fields around the basic symbol to provide the necessary amplifying information. Some fields are mandatory, others are optional. See appendix B for a detailed description of fields (App B, p B-77), and how you use them to clearly and concisely depict the information conveyed by the symbol. Figure 1-12 shows how you develop fields around the basic symbol.

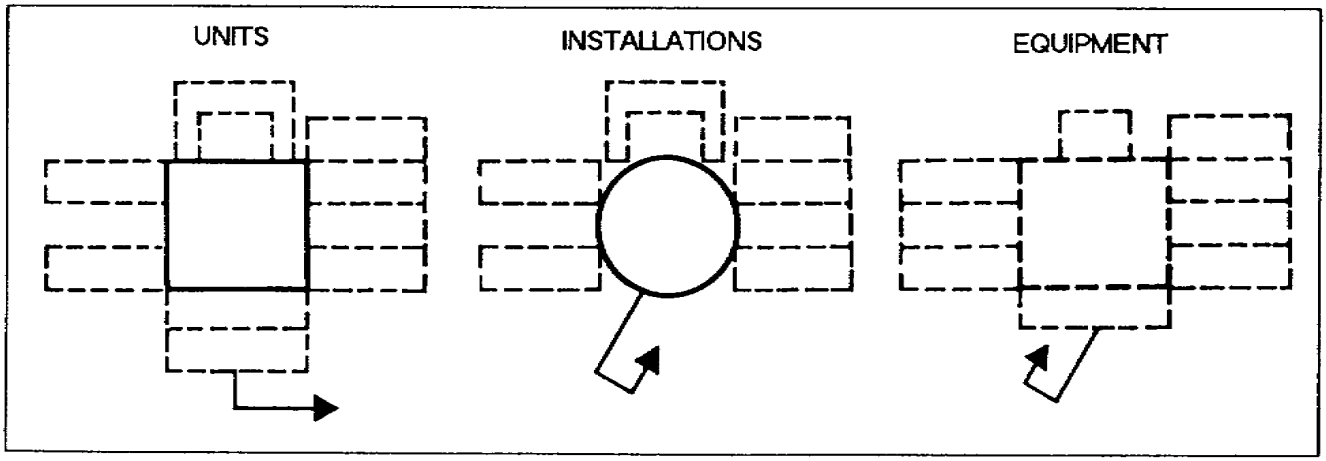


Figure 1-12. Use of fields

5. Symbols for Location.

You use basic unit and installation symbols to indicate their location. The center of the mass of the symbol indicates the general vicinity of the center of the unit. If you need to indicate a location more precisely, use the basic symbol mounted on a staff, which you extend or bend so that the end of the staff points to the precise location.

You may want to include dates and times under or inside your symbol for such items as opening an observation post or the expected establishment of a unit headquarters (HQ). You use solid line symbols to represent a present or actual location.

Use a broken line symbol to represent a future or projected location. For a detailed description of location symbols and other symbols for the ground environment, refer to appendix B. Figure 1-13 shows examples of a present and a future location, with the date and time affixed.

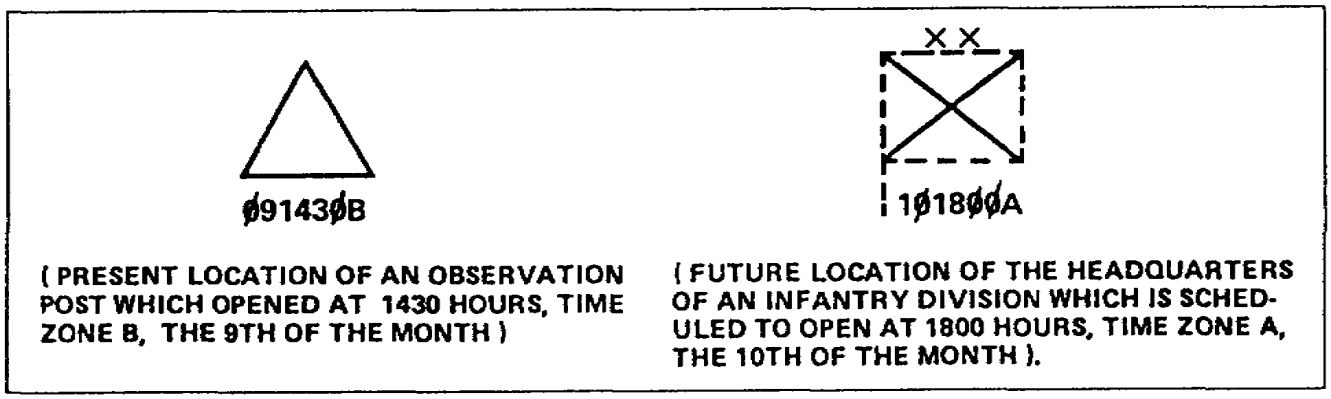


Figure 1-13. Present and future location symbols

6. Symbols for Points, Lines, and Areas.

a. Points (App B, p B-31). There are a variety of symbols used to indicate a specific point of military interest.

b. Lines (App B, p B-33). Lines connect two given points, either directly or by means of interconnecting points. A line must be determined by at least two grid references. Figure 1-14 shows a graphic illustration of a forward line of own troops (FLOT).

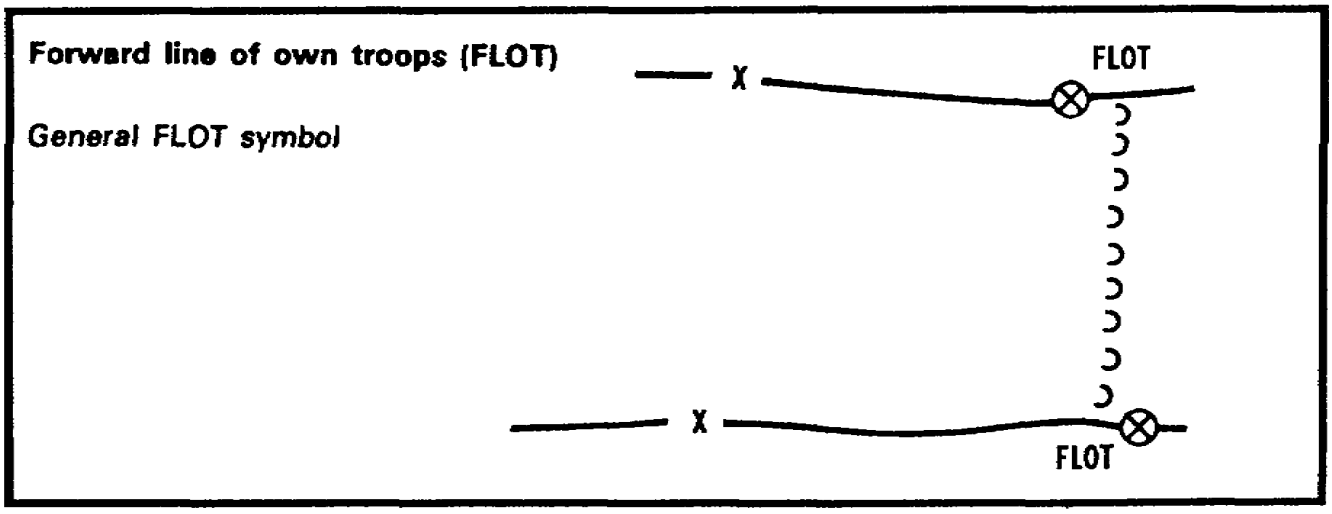


Figure 1-14. FLOT line

c. Areas (App B, p B-39). An area designates a specific piece of terrain or space. You specify this area with an

irregular line. You indicate the activity taking place within the area by the letters and/or numbers within the irregular line. Figure 1-15 illustrates a free-fire area (FFA).

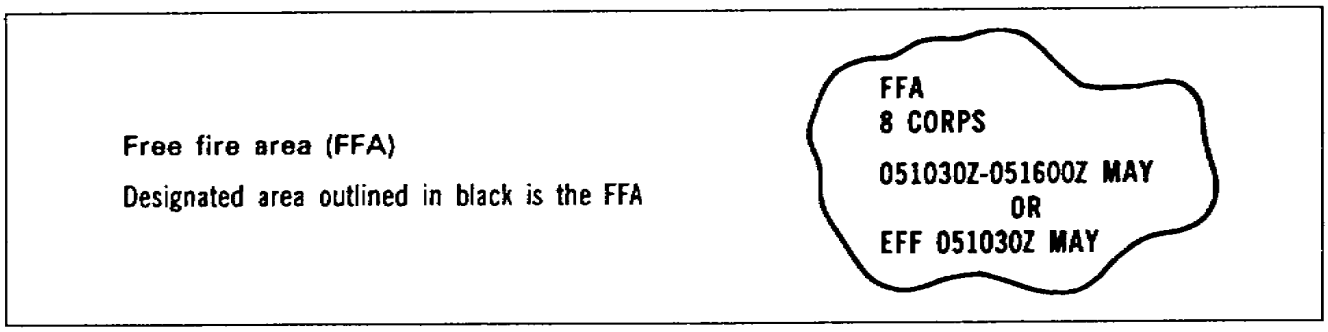


Figure 1-15. Free-fire area

7. Symbols for Routes, Obstacles, Crossings, Movements, and Fire Planning.

a. Routes (App B, p B-45). A route is a line, undefined in each direction. As soon as a direction is shown, the route becomes a nonstatic activity. It is the prescribed course to travel from a specific point of origin to a specific destination. Figure 1-16 shows a route depicting a direction of attack.

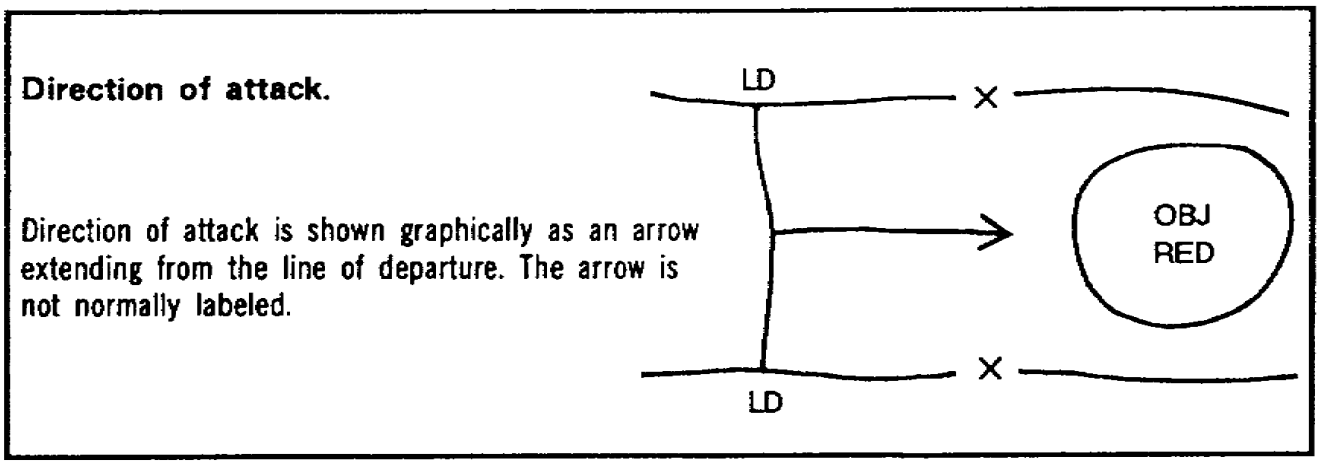


Figure 1-16. Direction of attack

b. Obstacles (App B, p B-48). An obstacle is any natural or man-made obstruction that canalizes, delays, restricts, or diverts movement of forces. There are four types of obstacles: points, demolitions, linear, and minefields. Figure 1-17 shows an obstacle of an antitank ditch reinforced with antitank mines.

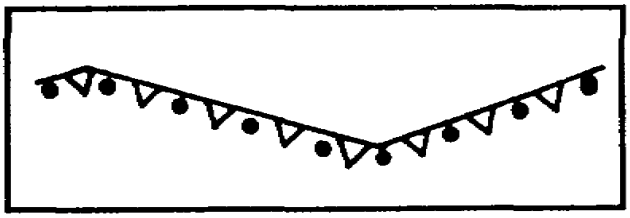


Figure 1-17. Antitank obstacle

c. Crossings (App B, p B-52). A crossing site is a location along a water obstacle that provides a favorable crossing point, depending on the situation and the equipment you have available. Figure 1-18 shows examples of various types of crossing sites.

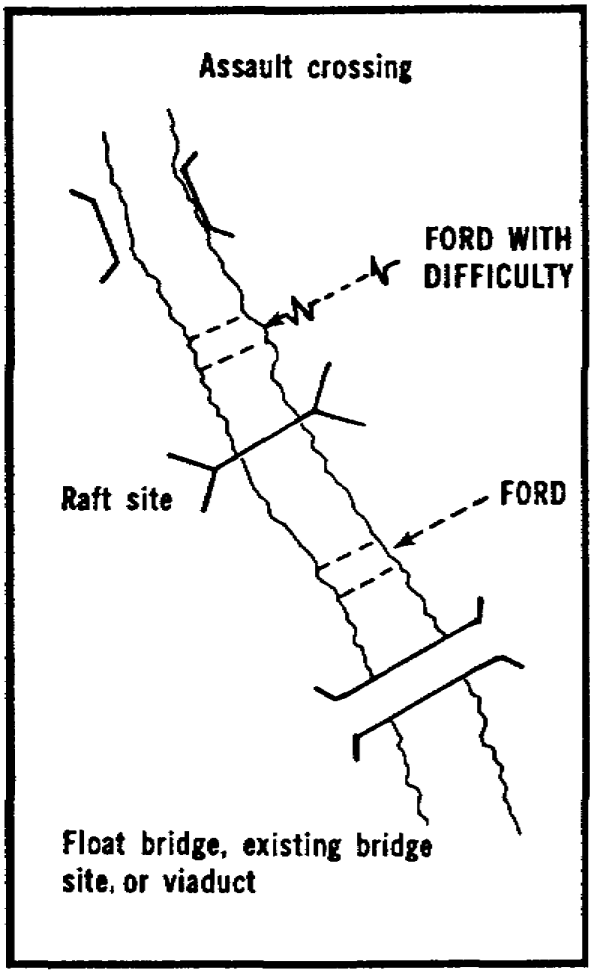


Figure 1-18. Crossing sites

d. Movements (App B, p B-54). There are two basic types or classifications of movements: general and specific. General movement symbols use boundaries, while specific symbols control direction. Figure 1-19 shows the symbology used to depict a general turning movement.

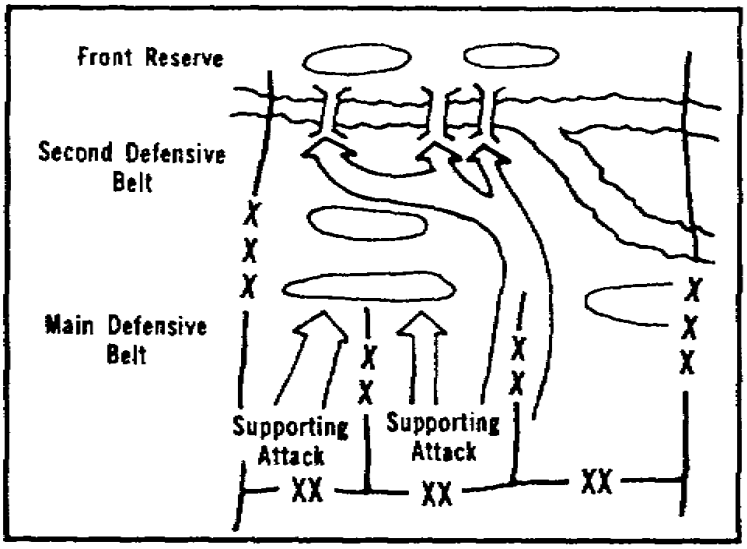


Figure 1-19. General turning movement

e. Fire Planning (App B, p B-58). Fire planning symbols follow the same rules as either points or lines.

8. Boundaries.

Maps, and often your overlays, include boundaries. You show boundaries by using a solid line. You indicate proposed boundaries with broken lines.

a. Lateral Boundaries. You include the size of the largest unit, and designation of the highest unit and/or national designation with lateral boundaries. Figure 1-20 shows examples of lateral boundaries.

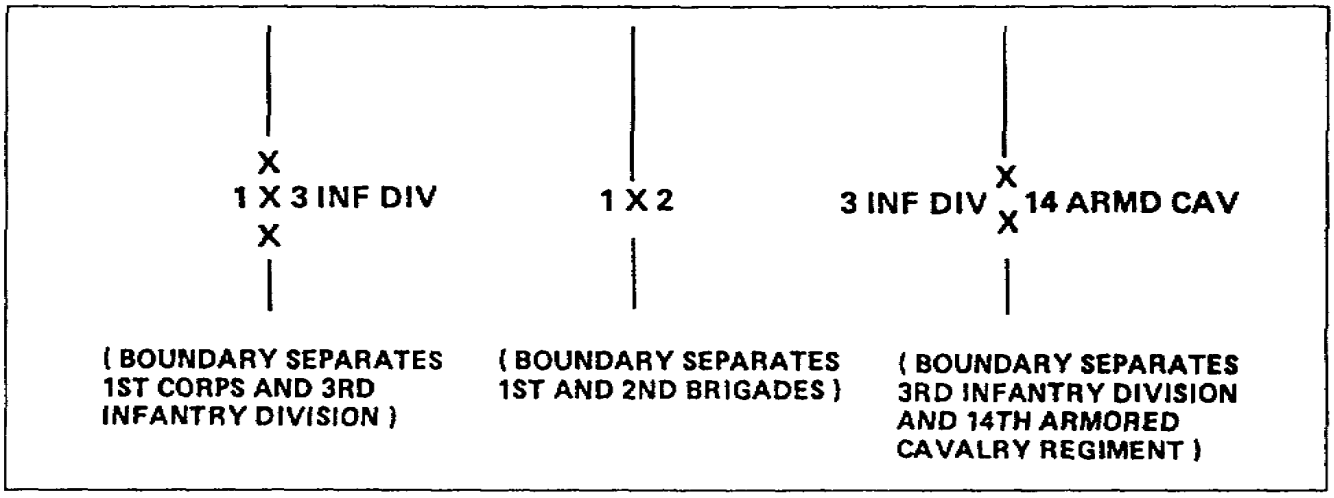


Figure 1-20. Lateral boundaries

b. Rear Boundaries. When indicating rear boundaries, the size indicator along the boundary corresponds to the smaller unit or the commanded unit, and not the commanding unit. Figure 1-21 shows examples of rear boundaries.

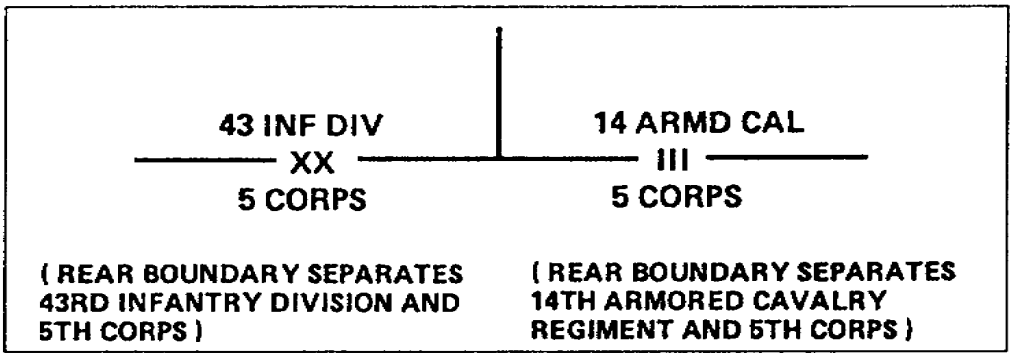


Figure 1-21. Rear boundaries

9. Battlefield Activities.

The preceding paragraphs introduced you to a variety of symbols. These symbols, when used alone, provide a specific piece of information. When you use these symbols in combinations on an operations overlay, we get a picture of the battlefield. These may depict offensive, defensive, or retrograde situations. Appendix B, p B-90, illustrates an example of a defensive control measure.

10. Summary.

In this lesson, you learned the symbols and techniques you use to prepare map overlays. Since this subcourse is a basic introduction to preparing map overlays, you may need additional information. Appendix B details the use of symbols. Review this extract to enhance your knowledge and recognition of map overlay symbols. Appendix B, p B-89, identifies branch symbols that are unique to certain NATO allies.

In lesson 2 of this subcourse, you will learn the techniques you use to prepare overlays for viewgraphs. Before proceeding to lesson 2, complete the practice exercise. Check your answers with the practice exercise answer key and feedback sheet. If any of your answers are incorrect, review the area indicated until you understand the material. After successfully completing the practice exercise, proceed to lesson 2.

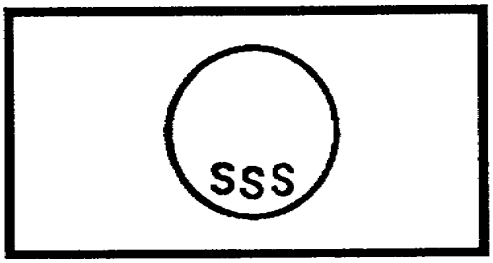
LESSON 1

PRACTICE EXERCISE

The following items will test your grasp of the material covered in this lesson. There is only one correct answer for each item. When you complete the exercise, check your answer with the answer key that follows. If you answer any item incorrectly, study again that part of the lesson which contains the portion involved.

Situation: You are the graphics documentation specialist for your unit. You are briefing your unit on the maps and map overlays you will use for your upcoming exercise.

1. The symbol shown below indicates that the installation depicted is from which service?



A. Army
B. Navy
C. Air Force
D. Marine Corps

2. Which of the following colors should you use for overlay symbols depicting enemy radiological areas?

A. Blue
B. Black
C. Yellow
D. Magenta

3. The basic symbols alone may not convey all the necessary information. In order to provide more complete data, you add amplifying information to the basic symbol. Where should you place this additional information?

A. In the legend
B. In the footnotes
C. In the surrounding fields
D. In the marginal information

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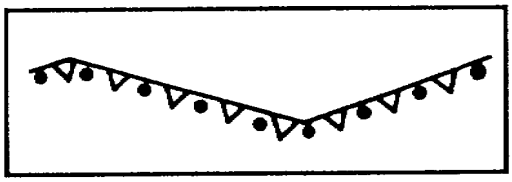
4. The symbol shown below indicates which of the following on a map or map overlay?



A. An obstacle
B. A FLOT line
C. A free-fire area
D. A river crossing site

LESSON 1

PRACTICE EXERCISE

ANSWER KEY AND FEEDBACK

Item	Correct Answer and Feedback
1.	D. Marine Corps The basic symbol is modified with a service indicator when preparing graphics for interservice use. Symbols for Army units and installations require no modifying indicator. The basic symbol is assumed to represent an Army component unless otherwise modified (page 1-7, para 2b(4)(b))
2.	C. Yellow When you have different colors available, you use color as a standard distinguishing part of the symbol. You use the color yellow to indicate chemical, biological, or radiological areas of friendly or enemy forces (page 1-12, para 3c).
3.	C. In the surrounding fields You use fields whenever necessary to provide additional information for the symbol being used. Some fields are mandatory, some are optional (page 1-13, para 4).
4.	A. An obstacle Obstacles are natural or man-made obstructions that hinder the movement of forces. In this case, the obstacle is an antitank ditch reinforced with a minefield (page 1-15, para 7b and page 1-16, figure 1-17).

LESSON 2

PREPARE VIEWGRAPH OVERLAYS

Critical Task: 113-579-5060

OVERVIEW

LESSON DESCRIPTION:

In this lesson you will learn the procedures for preparing viewgraph overlays. You will learn design techniques for preparing a VGT master, methods of diazo film processing, and the procedures for operating an Ozalid diazo processing machine. Finally, you will learn the methods for mounting the VGTs and VGT overlays for presentation on the overhead projector.

TERMINAL LEARNING OBJECTIVE:

ACTIONS:

a. Identify the methods for designing and preparing a VGT, including caption and text lettering.

b. Explain the procedures for preparing a VGT master.

c. Describe the process of diazo reproduction, including the process of color separation.

d. Describe the procedures for operation of an Ozalid diazo processing machine.

e. Explain the methods for mounting VGTs and hinging VGT flips for presentations.

CONDITION: You will be given information from FM 101-5-1, STP 11-25M13-SM-TG, and NAVEDTRA 10472.

STANDARD: You will identify and explain the procedures for preparing and reproducing VGTs and VGT flips, and describe the operation of the Ozalid diazo processing machine in accordance with STP 11-25M13-SM-TG.

REFERENCES: The material contained in this lesson was derived from the following publications: FM 101-5-1, STP 11-25M13-SM-TG, and NAVEDTRA 10472.

INTRODUCTION

Considering the size and complexity of today's Army, it is hard for commanders to keep track of the multitude of information they receive on a daily basis. Everyday, commanders receive statistical data and operational information that guides them in their decision-making process. They must receive this data clearly and in a timely fashion to make their command decisions.

With the use of visual aids, you can prepare this data for presentation shortly after receipt. You must be able to prepare these aids easily and quickly, and in a fashion that lets you change or update them as required. The use of visual aids makes it possible to take quicker action and to cover more vital information than otherwise possible.

This part of the lesson describes the basic techniques you use for preparing VGTs for projection. You will learn to prepare the master copy for the overlay. In part B of the lesson, you will learn to transfer the master to diazo film. You will go through the steps to expose and develop the film, and then mount it in a permanent protective frame.

PART A - IDENTIFY VIEWGRAPH COMPONENTS

The preliminary information you need for preparing viewgraph overlays is projectional design and the lettering size. To communicate ideas or to show information properly, your overhead projections (viewgraphs) should be simple, direct, and to the point. The illustrations should be pleasing to the eye, but do not lose the meaning of the message by using fancy frills or unnecessary detail. Another important factor is legibility. To ensure that your graphics are effective, make them visually fluent, conveying the requestor's ideas clearly and concisely. As with your map overlays, simplicity should be your watchword when making VGTs.

1. Design.

You design VGTs and VGT overlays to project on a screen using an overhead projector. The VGTs are usually 7 1/2 inches by 9 1/2 inches (aperture area). The glass surface of most overhead projectors is 10 X 10 inches. Although you can use all the projector's glass surface for projection, you should avoid using the outer edges, as this causes distortion at the extremes.

When you design your VGT, use a horizontal format. This means that you place the 9 1/2-inch dimension of the VGT horizontally on the projector. The horizontal format is preferable to a vertical format, as some parts of vertical VGTs are difficult to see in some environments. Horizontal formatting also ensures that the projected image fills as much of the viewing screen area as possible.

2. Lettering.

Most VGTs you will design contain text, or at least captioning. You should construct your captions and lettering large enough for normal viewing by persons of normal vision. Most lettering should be uppercase, as uppercase letters are larger and easier to read at a distance.

To find the minimum letter size for a 7 1/2 inch projectional, you must know two factors; the distance in feet from the projector to the screen, and the distance in feet from the screen to the farthest viewer. With this information, and using a nomograph (see figure 2-1), you can find the recommended minimum letter height in inches as follows.

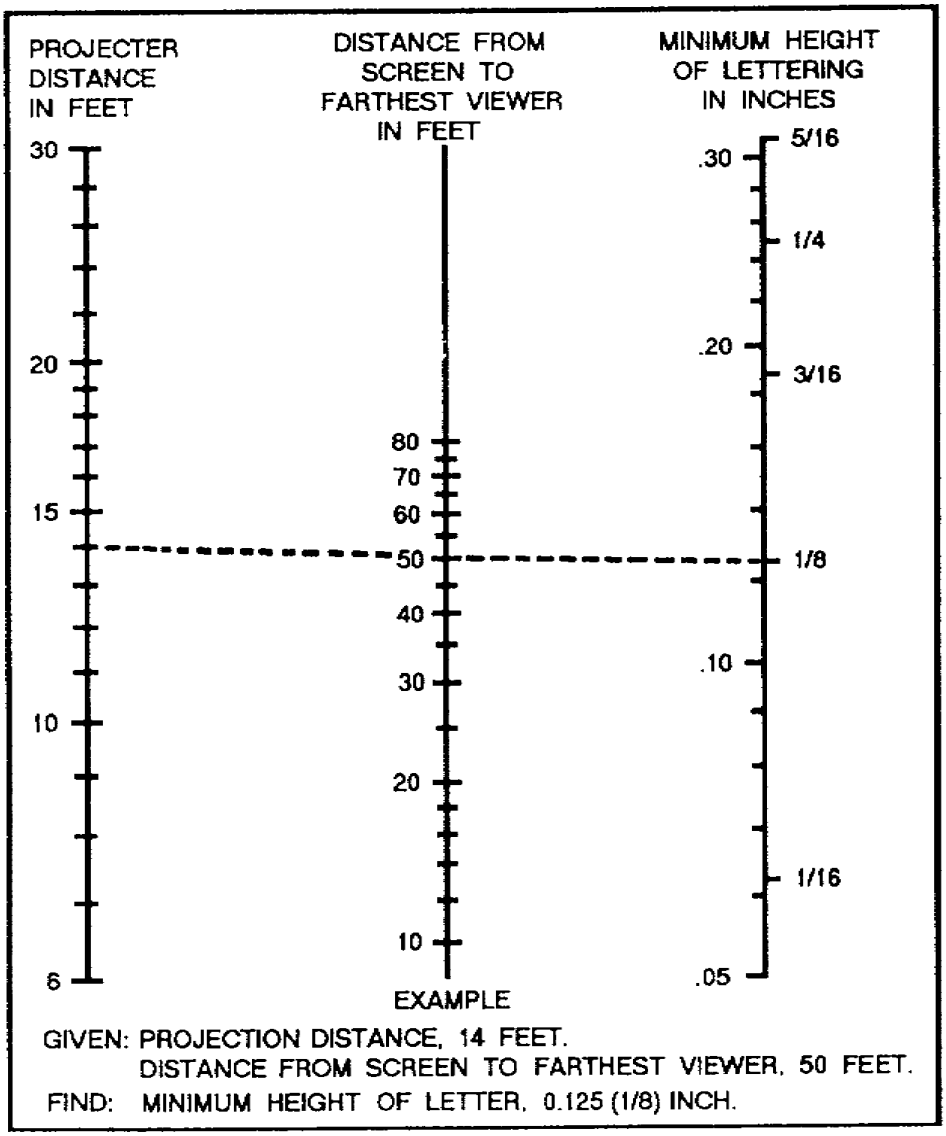


Figure 2-1. A lettering nomograph

a. Plot the points that correspond to the known distances on the appropriate scales of the nomograph.

b. Draw a straight line through these points, extending the line until it intersects the vertical scale at the right.

c. The last point of intersection gives you the minimum height of the lettering in inches.

Make your letters as large as reasonably possible. Lacking the use of the nomograph, a good rule of thumb is to use no lettering smaller than 14 point (approximately 3/16").

3. Methods.

You may make your viewgraphs and overlays by hand, or you may make them using a mechanical/chemical process, e.g., diazo.

a. Handmade Viewgraphs. The simplest form of viewgraph is a handmade projectional.

(1) You make the handmade viewgraphs by drawing or writing on a clear sheet of acetate with a grease pencil or with a plastic marking pen. You can easily erase the acetate with a cloth to make corrections and updates, or to reuse the plastic.

(2) Stabilo pencils work well for finely detailed drawings or copy. They work well on most any type surface.

(3) Felt tip pens are useful for coloring small areas. Since the colors of these pens are transparent, you must apply them carefully. Each overlapping stroke deepens the tone and may produce uneven coloring.

(4) The use of standard drawing ink presents a problem. The clear acetate sheets are smooth, and therefore do not absorb the ink. The practice of roughing up the surface of the plastic with a fine abrasive (such as talcum powder or pumice) or an eraser enables the surface of the acetate to hold the ink. Unfortunately, the use of abrasives scratches the surface of the acetate. These scratches appear as dark marks on the screen. Using special acetate inks eliminates this problem.

(5) Since you do not normally mount these handmade transparencies, they are not very durable. They tend to wrinkle, smudge, and tear. For more permanent products, you will want to produce mechanically- or chemically-processed overlays.

b. Diazo Transparencies. The handmade method of preparing viewgraphs is fast and simple. You use this method when time is

short, or when graphic equipment is unavailable. When not required to work under these constraints, mechanical/chemical processing provides you a more professional and durable product.

(1) The diazo process. The diazo process is the most commonly used method for producing top quality viewgraphs for briefings and training materials. The term "diazo" refers to organic emulsion, which creates color through exposure to light, and the development of the image on film by using ammonia. The diazo process makes use of specially treated films and paper, and a diazo process printer to expose and develop these materials.

(2) How the diazo process works. Diazo film, or foils, and the paper are treated with a mixture of diazo salts and an azo dye. These salts are sensitive to light, especially ultraviolet light. When you expose the film to ultraviolet light, it chemically changes so that no image appears. If the coating is not exposed, and is developed in an alkaline medium, the diazo salts combine with the azo dyes to form a color image. Through the use of various dyes, you may create many colors on the acetate. Figure 2-2 illustrates how the chemical reaction of the diazo emulsion, when exposed to ultraviolet light and developed using ammonia, forms images on the film.

(3) Using the diazo process. There are three major operations involved in producing VGTs using the diazo process:

(a) Preparing the diazo masters.

(b) Exposing and developing the diazo film.

(c) Mounting the diazo transparency.

PART B - MAKE A VGT WITH THE DIAZO PROCESS

4. Preparing the Master.

One of the keys to successful diazo VGTs is the materials you use to prepare your master. A diazo master works on a principle that opaque image areas prevent ultraviolet light from striking the diazo film, while nonimage areas let the light through to expose the film.

With this in mind, the base material for the diazo master should be made of transparent film or translucent paper. Use a high quality tracing paper. Select a paper grade with a fine fiber texture, and use the same kind for all masters. This eliminates changing exposure times.

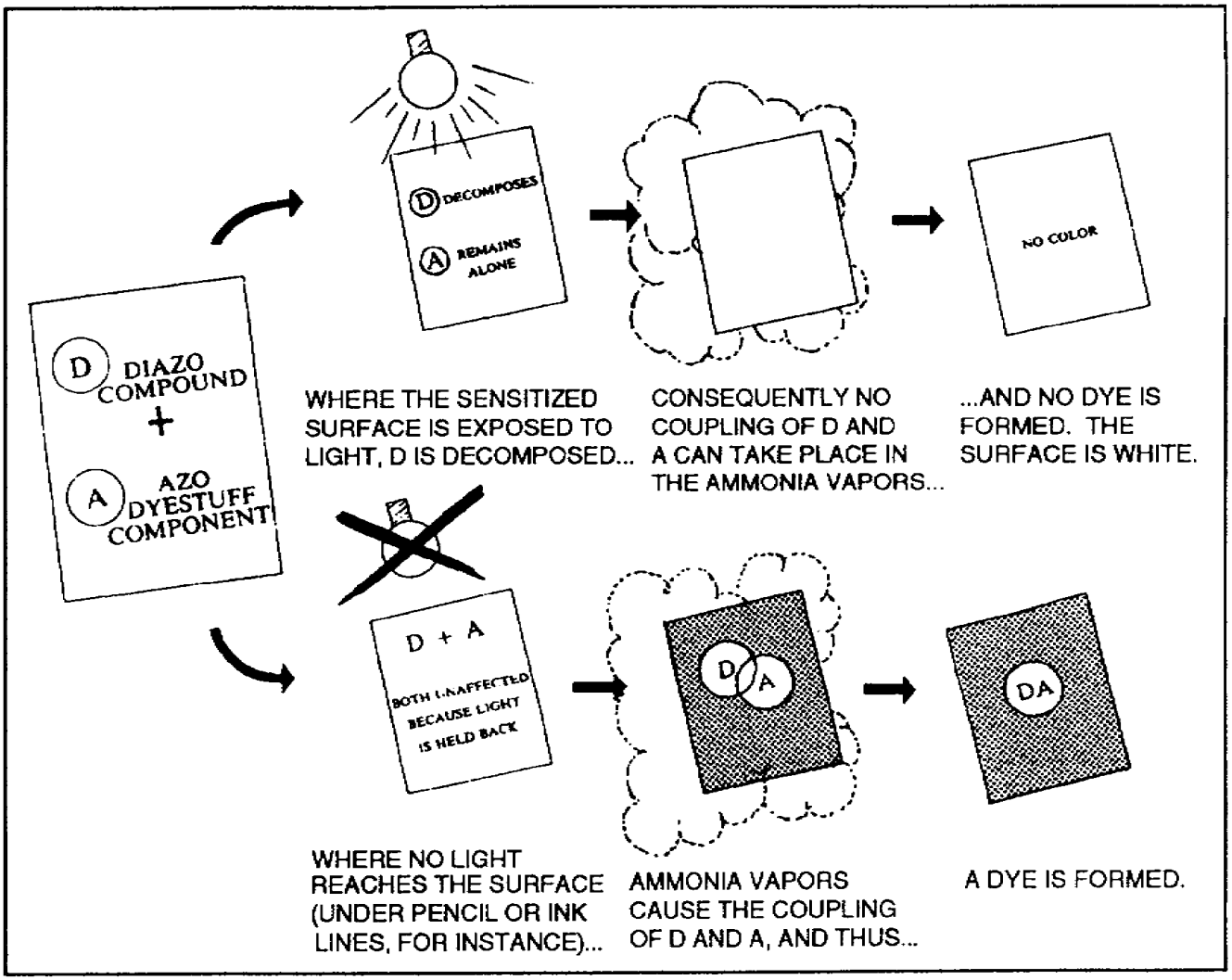


Figure 2-2. Simplified diazo process

a. Preparation. To prepare a master, make an actual size drawing on a sheet of tracing paper.

(1) You prepare the master using any available means, such as tracing a projected image, tracing existing materials, tracing from a rough, or creating your own drawings.

(a) You can draw any layout work directly on your master using a light blue pencil, as light blue does not reproduce on a diazo reproduction machine.

(b) When tracing existing materials such as a photo or map, place a sheet of tracing paper over it and ink in all required lines. This, of course, produces results in a one-to-one ratio. If you require other than a one-to-one image, you can enlarge or reduce either the original or the tracing using a device such as a process camera. These camera images provide good originals for the diazo process.

(2) Prepare the master with at least two registration marks. Locate the register marks in opposite corners of the master. Position the marks so that they lie outside of the aperture form so that they do not project onto the screen (see figure 2-3).

b. Materials. Tracing paper is the basic material used for diazo masters. Translucent paper lets light pass through easily and provides a desirable working surface for pencil or ink.

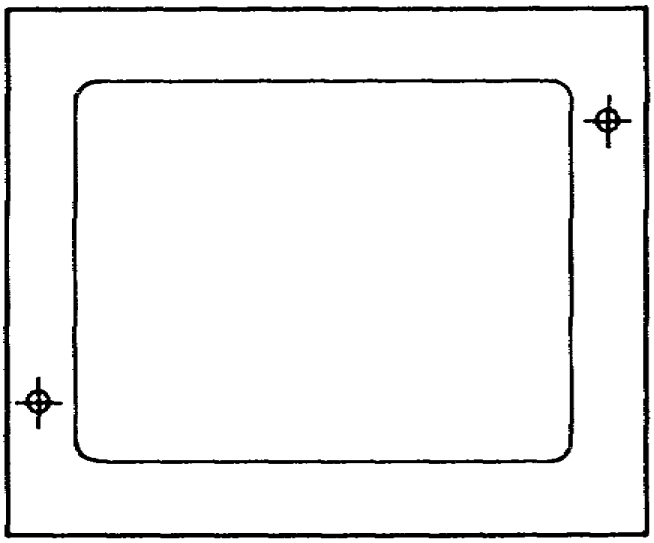


Figure 2-3. Master register marks

(1) Drawbacks of translucent tracing paper. Although translucent tracing paper makes good masters, it does have certain drawbacks. When used for color separation, it is hard to see through, especially when preparing several overlays. It tends to wrinkle when you apply tape or large amounts of ink to the paper. Also, the exposure time is relatively slow in the reproduction step.

(2) Mylar, an excellent master material. Mylar, a transparent polyester film, is an excellent master material. Being transparent, it allows maximum light passage and facilitates color separation well. Mylar is dimensionally stable and holds adhesive tapes, paste-up letters and symbols, or other photographically reproduced images firmly on the film. Mylar also is available with a matte surface. The matte surface is porous, making for easier and better inking.

c. Colors. If your VGT requires more than one color, you must prepare a separate master for each color, using a process called color separation.

(1) Using too many color sheets per viewgraph affects the amount of light projected, resulting in a dull image. You should not exceed five sheets per viewgraph.

(2) To reduce the number of sheets, you may superimpose one color on top of another, thus producing a third color. For example: blue on yellow produces green; red on yellow produces orange; red on blue produces violet, etc. It is a good rule to keep these combining colors light. This keeps them from becoming too dark for projection on the screen.

(3) When you make multicolor viewgraphs, you make a black (KBK) copy first. On your second sheet, ink in the image to appear on the first color foil. Continue this process for each color required. Diazo materials come in many colors. Figure 2-4 lists some common acetate materials.

CLEAR ACETATE W/COLORED IMAGE

FULL OR DARK	COLOR	PASTELS
KYL	Yellow	PYL
KOR	Orange	POR
KRD	Red	PRD
KMG	Magenta	PMG
KBR	Brown	PBR
KBL	Blue	PBL
KGN	Green	PGN
KBK	Black/Grey	PBK
KBKD	High Density Black	
KMAX	High density sepia for duplicate masters	
SGN-41P7C	Contact reversal film	

COLORED ACETATE W/IMAGE

EBKB - Blue background with black image.
EBKY - Yellow background with black image.
EBKG - Green background with black image.

Figure 2-4. Acetate diazo materials

d. Light-blocking Techniques. When preparing your master, you may decide to block, or mask, certain areas of your master sheet. There are several techniques for blocking or masking.

(1) Used card-weight diazo paper is a good, inexpensive material for masking a large area of color when the area is not complicated in shape. To make an opaque mask, print a copy of the master on diazo-weight stock. Then cut out the image area using a knife or scissors. Next, mount the mask in its position on a sheet of mylar. The masked area prints as a color on the diazo film.

(2) You may attach nonadhesive materials, like card-weight paper to mylar, by using translucent plastic tape. Although it lets light pass during exposure, and may be visible on the master, this tape will not reproduce on the developed sheet.

(a) In selecting plastic tape for this purpose, you get the best results from one having a thin base and high translucency. This type tape does not pucker or shrink as does ordinary cellophane tape. You can place a strip of this tape on the margin of the master for making pencil notations.

(b) Do not use masking tape or other opaque tapes for this purpose, as their images show up in the developed copy.

(3) The most common film used when producing an intermediate is K-MAX and contact reversal film. Sepia intermediates make good transparency masking materials.

(a) To use a sepia diazo sheet as a mask, fully develop an unexposed KSP, K-MAX, or 501LC sheet of film.

(b) Place the developed film on a sheet of mylar over the master. Since this film is transparent, you can see through it to cut out the image area.

(c) Then mount the image area in position on the sheet of mylar using transparent tape. The image area covered by the sepia intermediate then prints as a solid color on the diazo sheet.

(4) Several companies manufacture the transparent, nontranslucent, self-adhesive film that is ideal for making color separation. You apply these adhesive films over a sheet of mylar (they may come with their own mylar backing). Since the film is transparent it is easy to see through and work with.

(a) To make the color separation, cut around the desired image area with a #11 X-acto knife. After making the complete unit, remove the film from all nonimage areas. Since ultraviolet light does not pass through the film, areas protected by it print on the diazo sheet.

(b) This film is usually ruby red (rubylith) or orange (amberlith) in color, and it reacts identically when used as a masking material or for making color separations.

(5) Ruby red film also is available in tape form. You may use transparent yellow tape in much the same way as the ruby

red since both block the ultraviolet light effectively. Opaque tapes are available in various sizes ranging from 1/16 inch and up. These tapes are very useful for line work on film.

Once you have completed preparing your master, you are ready to transfer it to diazo film. You transfer the master chemically, using a diazo processing machine.

5. Diazo Processing Equipment.

Several companies manufacture diazo processing equipment. The major difference between machines is the size of materials they accommodate. There are four major sections to diazo machines: printing, developing, cooling, and exhaust.

a. Printing Section. The printing section consists of four basic units: light source, reflector assembly, print cylinder, and feed belts. Figure 2-5 shows the basic operation of the printing and the developing sections.

(1) For the reproduction process, you insert the original (master) and the diazo material into the machine.

(a) You place the diazo material emulsion side up on the freeboard, with the original placed on top. The feedbelts carry the materials around the revolving print cylinder, exposing the diazo material.

(b) After exposure, the pick-off assembly picks off the original and the print, and directs them toward the developing section.

(2) After the pick-off, the guide roller directs the original and the print to the separation tanks. This assembly separates the original and the print. The original moves out of the machine and the print moves to the developing section.

b. Developing Section. The developing section consists of a perforated stainless steel tank and a feed system. A supply tank continuously feeds the developing tank with ammonia at a rate of 50-60 drops per minute.

Electric heating rods in the developing tank heat the ammonia to accelerate the formation of ammonia vapors. These vapors escape through the perforations of the tank, and activate the image on the print. Figure 2-6 illustrates a basic ammonia flow system.

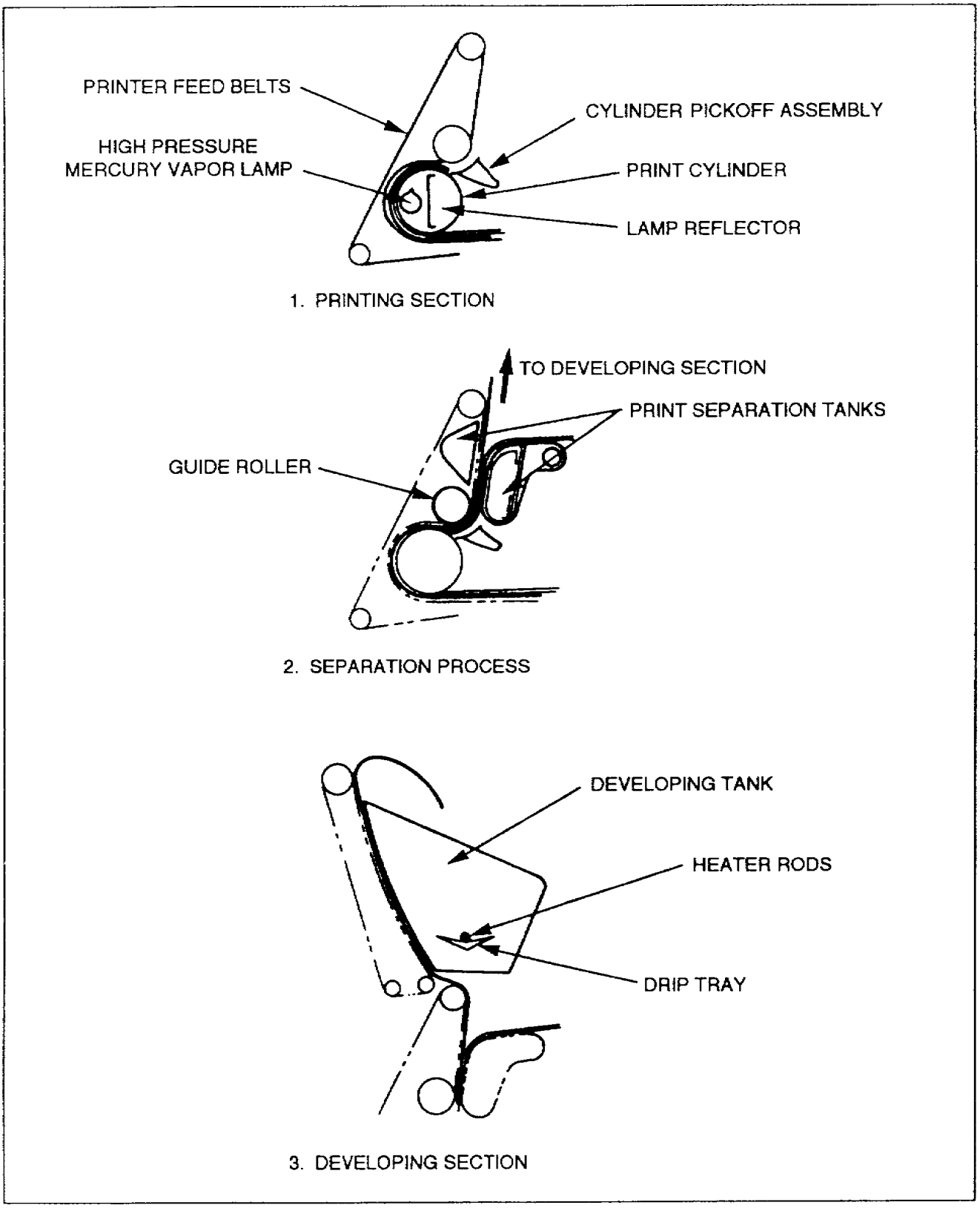


Figure 2-5. Diazo process operation

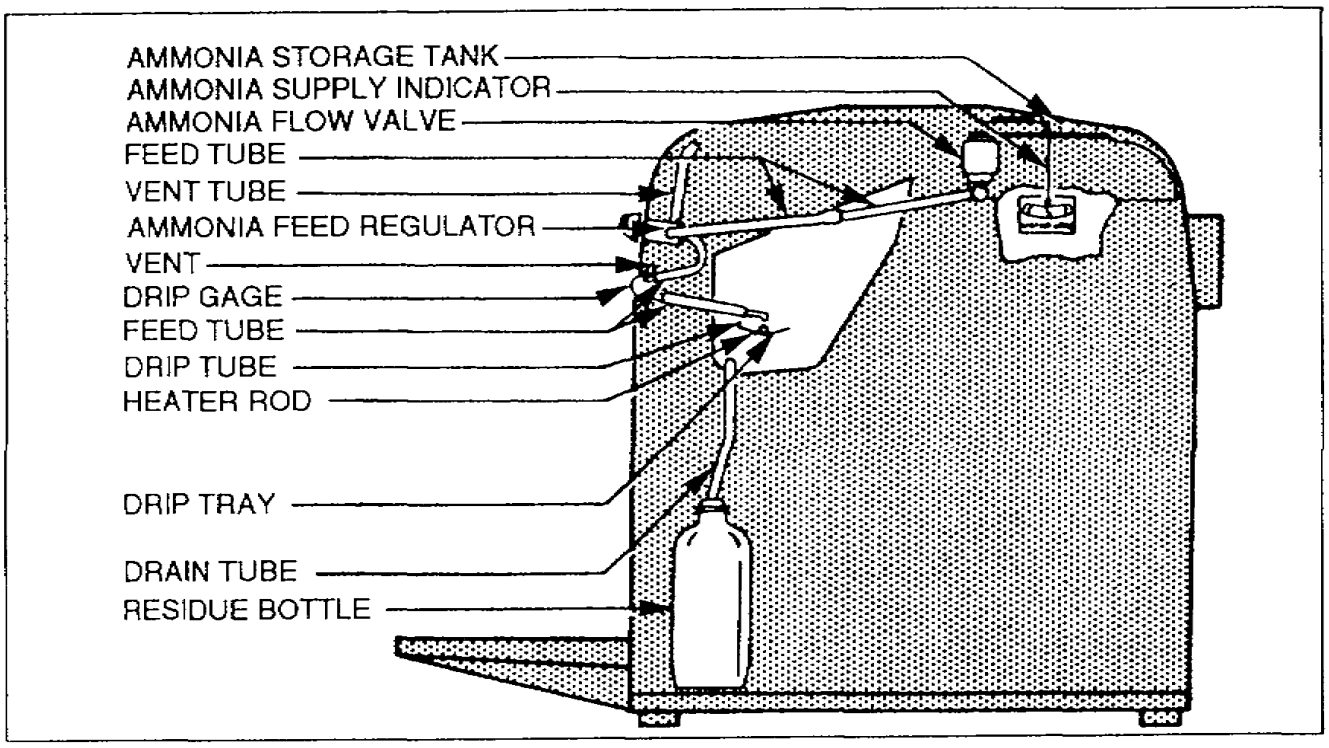


Figure 2-6. Basic ammonia flow system

c. Cooling and Exhaust System. The cooling and exhaust system prevents excessive amounts of heat or ammonia vapors from reaching the atmosphere of the room. The system consists of blowers driven by a motor to remove heat and vapors from the machine enclosure. This creates a partial vacuum within the machine, keeping the air within.

6. Operation of Diazo Processing Equipment.

The process of exposing and developing your films is important in the quality of your product. The following paragraphs discuss the process of diazo reproduction. Following this discussion is a step-by-step procedural guide for operating a diazo process machine.

a. Set-up. Remove your diazo foil (film) from its light-proof package. To achieve the best possible reproduction, place your master with the image face down on the emulsion side of the film. To help you determine the emulsion side, there is a nick located in the upper right-hand corner with the emulsion side up.

b. Exposure. Place your master on the foil, backed up by a "slip sheet." A slip sheet is the white separation sheet in the package between each foil. Use this slip sheet as the bottom sheet in the exposure step of the operation to protect the foil. Figure 2-7 shows the master (image side down) on the diazo foil (emulsion side up), with the slip sheet in place.

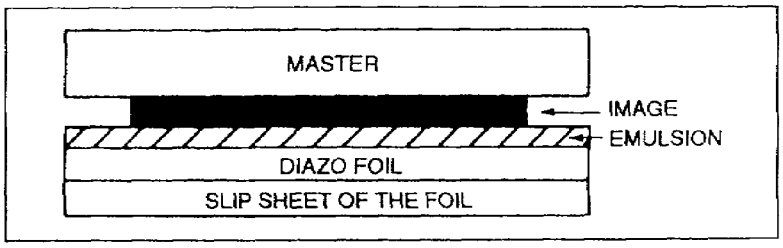


Figure 2-7. Diazo foil with slip sheet

(1) Run this assembly through the diazo machine. Ensure that your film develops fully. This helps keep the image from fading, or the background from yellowing. The speed of travel through the machine varies with color of the film. You may have to pass the film through the developing step several times to ensure full development.

(2) Determining exposure time is generally a result of a trial-and-error process. Overexposure results in the image being weak and faint in color. Underexposure will show a background. Once you obtain the correct exposure time, make a note of it and post it near your machine.

(3) The heat of the light source may cause shrinkage or expansion. To minimize this distortion, you should run all of your foils in the same direction.

c. Developing. After you expose the master and foil to the ultraviolet light of the diazo machine, the machine feeds the foil into the developing section.

(1) While exposure time is critical, development time is not. You must develop the film long enough to obtain maximum color, but you may remove it anytime thereafter.

(2) If you make a mistake, or an unwanted mark appears on your produced film, throw it away. Correct the master, or clean the diazo machine, and run another copy. Do not attempt to scratch away mistakes from the film. Scratches project as dark spots or lines on the screen.

d. Flash Exposure. You can produce highly saturated colors using maximum density diazo film.

(1) To create a variety of color densities, you can "flash" expose your film by exposing it to a light source. When you flash a film, some of the emulsion burns off. When you develop this film, the color density is somewhat less.

(2) To flash the film, run only the diazo foil quickly through the exposure light. Varying the exposure time results in different color densities. After flashing, expose and develop your film in the normal manner.

e. Diazo Intermediates. Diazo intermediates are important for duplicating art work. You may require duplicate VGTs to distribute to or exchange with other commands. Never send out your original art work. Duplicate your work on diazo intermediate sheets; sepia (KSP), sepia matte (KSPM), orange sepia (501LC), or sepia (K-MAX).

(1) To make sepia intermediates, expose and develop the sepia film as you would any other diazo film. Make sure the sepia image develops completely and is as dense as possible.

(2) One advantage of sepia intermediates is that you can make corrections on the film itself. Gently scrape away errors with a rounded knife. Make additions or corrections with a pen and ink.

7. Procedure.

To reproduce your graphics on diazo material, you must be able to properly operate the diazo processing machine. The procedures listed below demonstrate the proper operation of an Ozalid diazo processing machine.

NOTE: These procedures are for training purposes only. To operate your unit's equipment, always refer to local instructions and standing operating procedures (SOPs). Any diazo process machine may be used following the manufacturer's instructions and local procedures.

CAUTION

Use this machine in a well-ventilated area. Follow unit SOPs for handling hazardous chemicals.

a. Filling the Ammonia Storage Tank. To fill the ammonia storage tank, insert the drain tube into the residue bottle and turn the ON-OFF toggle switch to ON. If bubbles appear in the ammonia during operation, the temperature of the chemical is too warm. You correct this problem by diluting the ammonia solution with 1/8 to 1/2 cup of cold water.

(1) Adjust the ammonia system feed to a rate of 50 to 60 drops per minute.

CAUTION

During machine operation, the ammonia feed regulator should never be turned completely off.

(2) Give the machine a short warm-up period before operating. This allows the temperature to reach a range of 180 to 210 degrees. Adjust the printing speed for distinct lines and a clear background on the copy, and adjust the ammonia feed.

b. Making a Copy.

(1) Cut the diazo material to the size needed. Cut only if necessary.

(2) Feed the diazo material and the original into the feedboard, with the emulsion side of the diazo material up, and the original placed face down on top of the emulsion.

(3) Remove the original and the diazo material from the tracing separator belts.

(4) Insert the diazo material into the ammonia developer feed, emulsion side up, and without the original.

c. Stopping the Machine.

(1) Set the time according to the manufacturer's manual (usually 15-20 minutes) and turn off the lamp.

(2) Turn the ammonia flow off and allow the machine to run until the lamp cools.

NOTE: Some machines have an automatic shutoff.

(3) Feed a sheet of porous wrapping paper, 16 inches wide, into the machine.

(4) Turn the machine OFF with the paper in position around the printing cylinder, between the sealing sleeve and the perforated tank. This prevents a pattern from forming on the glass cylinder after long periods of nonuse.

8. Mounting the Diazo Foil.

Mounting adds durability, ease in handling, and professional appearance to your transparencies. You can mount your diazo foils in commercial mounts (frames), or you can make your own.

a. Commercial Mounts. Commercial mounts are generally made of cardboard or plastic. They come in a variety of sizes. Make sure that you specify size when ordering commercial mounts. Figure 2-8 shows examples of commercial viewgraph mounts.

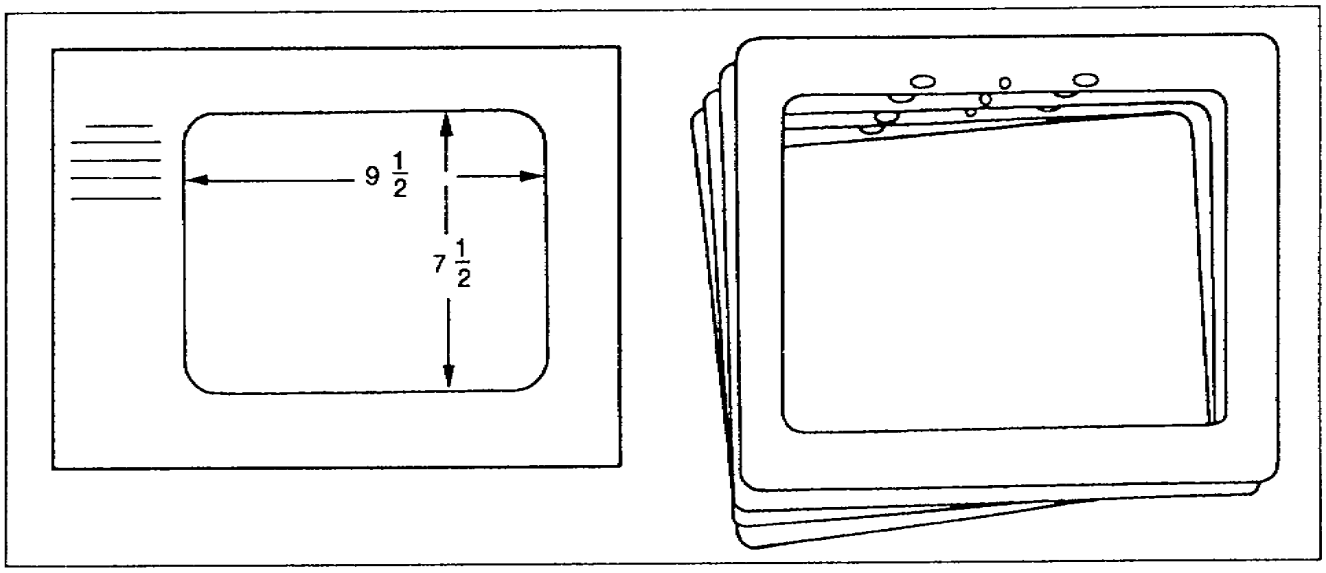


Figure 2-8. VGT mounting frames

b. Making Mounts. You can make your own mounts using most any opaque materials such as cardboard, heavy weight paper, file folders, etc. You cut out the aperture area, center your foil, and fasten it in place using masking or plastic tape. You should make your aperture area dimensions 7 1/2 by 9 1/2 inches.

c. Attaching Foils to Mounts. Regardless of the type of mount that you use, the easiest way to attach your foils to the mount is with masking or plastic tape. Avoid using cellophane tape, as it becomes brittle and shrinks with age. Tape all four sides of the foil to the underside of the mount. Taping the foils to the back provides a more professional looking job, and assures a flat projection area. Figure 2-9 shows the proper method for mounting a foil in the frame.

9. VGT Overlays (Flips).

a. Using Overlays. The use of overlays is one of the most effective features of overhead transparency projection. Since the VGT projector does not require the projectional to be tightly mounted, you can easily use overlays, or flips, to enhance the effectiveness and visual impact of your VGT. By the use of flips, you can prepare separate transparency sheets for problems, processes, and other forms of information. You then project these points in the desired order to present the information in a logical sequence.

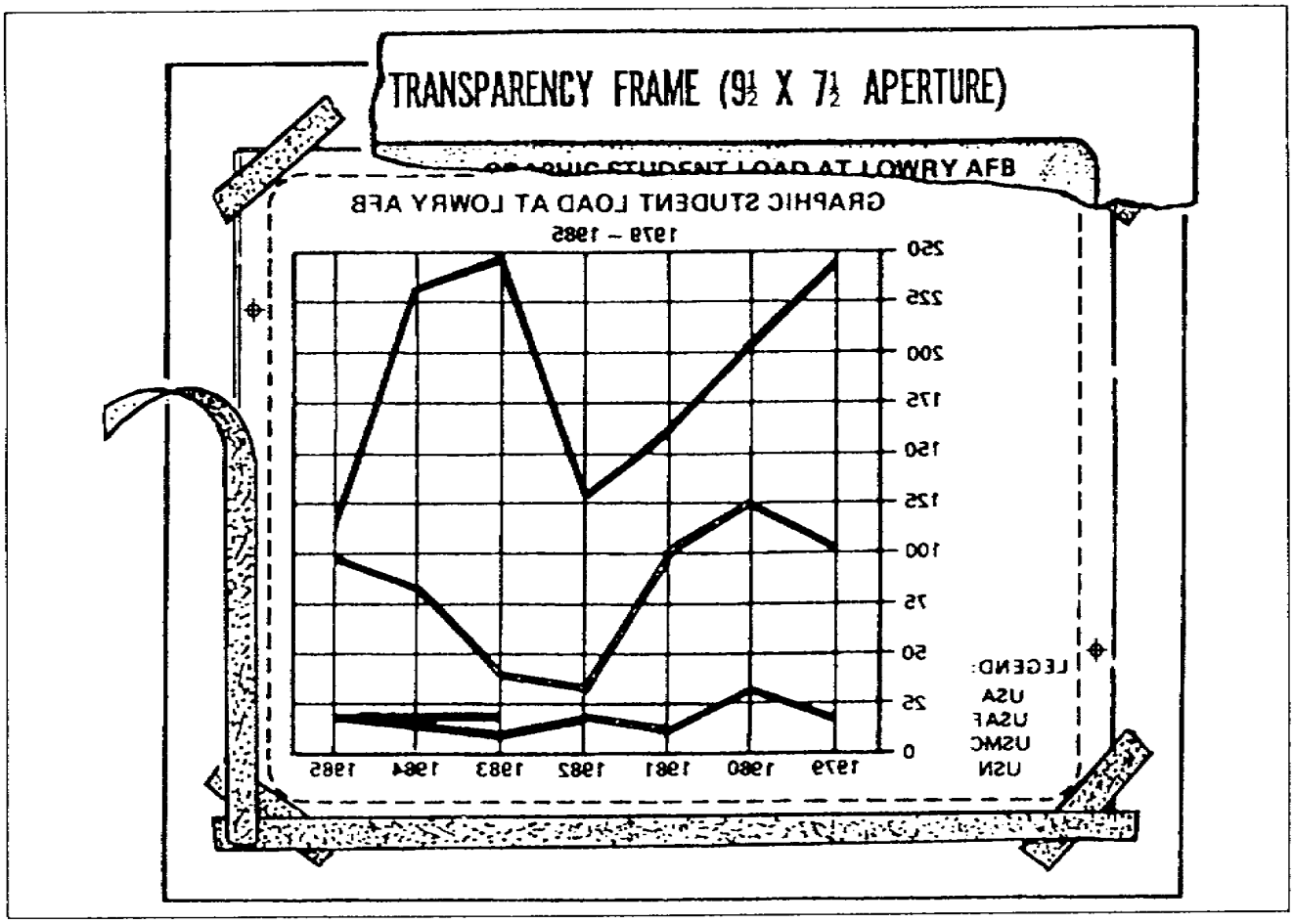


Figure 2-9. Mounting a VGT

b. Fastening Flips. Flips are overlays that are usually hinged at the sides of the base VGT. You position them so that you can swing them into position for projection.

(1) You fasten each flip with tape or plastic hinges along the side of the frame. If you present the flips in a specific order, place them over the base foil, in sequence, and attach to one side of the mount.

(2) If you want more flexibility in the presentation sequence, hinge your flips on both sides, alternating sides for each flip. If necessary, you also may use the bottom and top edges of the mount to hinge the flips. Figure 2-10 illustrates hinging of a flip onto a VGT.

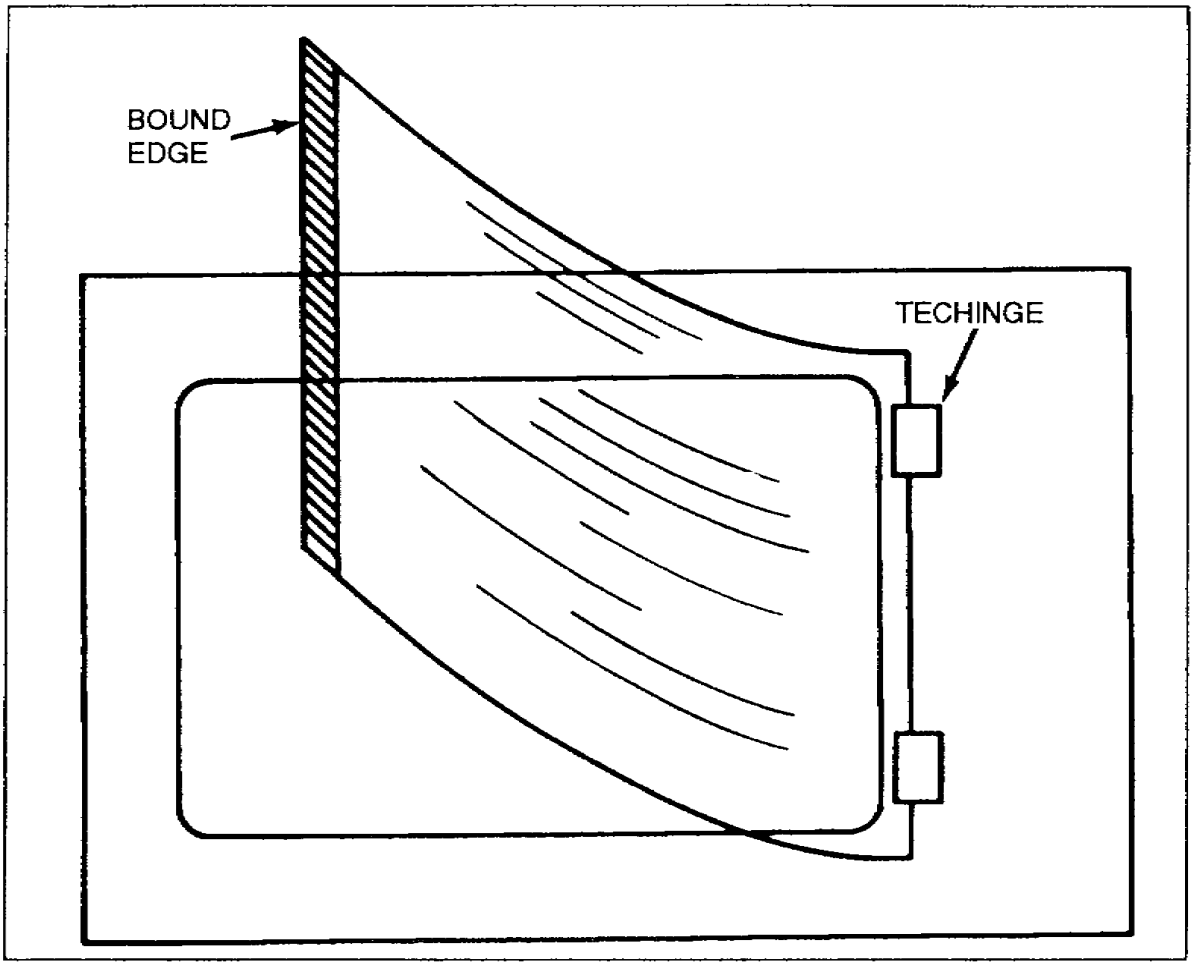


Figure 2-10. Hinging flips over a VGT

c. Select Sequence and Prepare Flips. With the flips properly hinged in place on the frame of the base VGT, you may present the amplifying information contained on the flips in the desired sequence. Your base foil contains the basic information. You decide what elements belong on the base foil, and what goes on each flip.

(1) You prepare the base foil and mount it in its frame. You then prepare the flips and hinge them in the desired pattern. Using the base foil and the flips, you can present a series of ideas or instructional points with this multiple-celled VGT. Figure 2-11 illustrates the concept of multi-cell VGT presentation. Note the registration marks on each cell.

(2) You must know if the receiver of your VGTs uses a front or rear projection method. You must know this in order to determine how to mount your films. For front screen projection, you mount the foils right side up; for rear screen projection, you mount them face down on the rear.

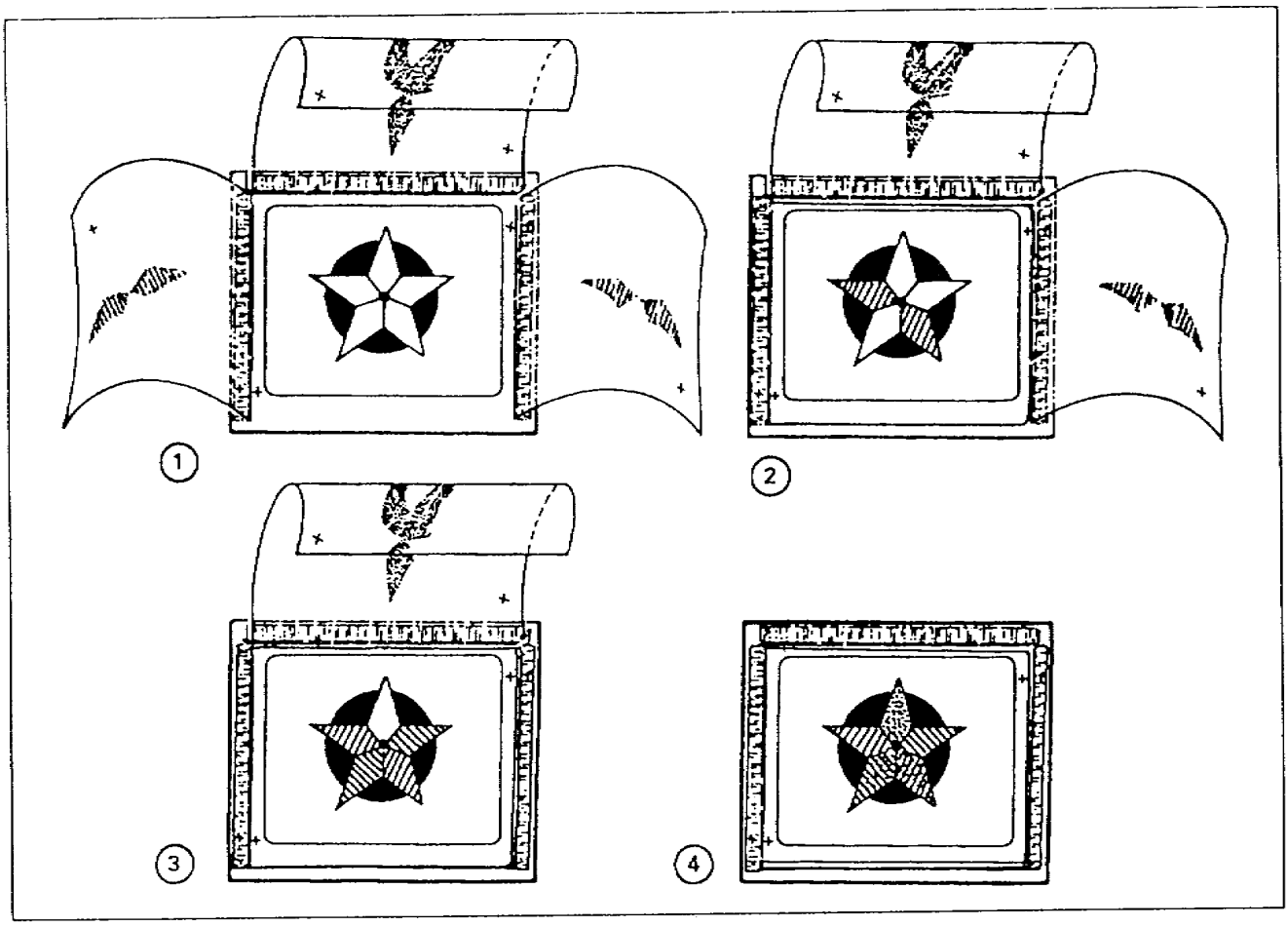


Figure 2-11. Multi-cell VGT using flips

10. Summary.

Visual aids are a major part of the tactical documentation used in the Army today. As your unit's graphic specialist, only your imagination limits your creativeness and effectiveness in the graphics you prepare. Using the criteria of the requester, you plan your transparencies to provide the informative impact he desires to clearly and concisely make his point. Your text and caption lettering must be large enough to see clearly from the most distant vantage point anticipated.

You may make VGTs by hand or by machine. The diazo process is the most common machine method. It uses chemicals to provide professional-appearing foils for projection. You may include colors using the color separation process. Adding overlays, or flips, allows you to add amplifying information to the basic VGT.

This concludes lesson 2 and the subcourse. The following consists of a practice exercise and practice exercise answer and feedback sheet. Before attempting the subcourse examination, complete the practice exercise. Check your answers with the practice exercise answer and feedback sheet. If any of your answers are incorrect, review the area indicated until you understand the material. After successfully completing the practice exercise, proceed to the subcourse examination. Complete the examination following the instructions contained therein.

LESSON 2

PRACTICE EXERCISE

The following items will test your grasp of the material covered in this lesson. There is only one correct answer for each item. When you complete the exercise, check your answer with the answer key that follows. If you answer any item incorrectly, study again that part of the lesson which contains the portion involved.

Situation: You have received a VI work order to produce and frame a VGT to be used for overhead projection at an exercise briefing.

1. Your work order requires the inclusion of text. The work order states that the projector will be positioned 10 feet from the screen, and that the farthest viewer will be 70 feet from the screen. What is the smallest lettering size you should use on your VGT?

   A. 1/8 inch
   B. 3/16 inch
   C. 1/4 inch
   D. 5/16 inch

2. You must process your VGT using the diazo method. The diazo method of reproduction uses which of the following types of processing?

   A. Chemical
   B. Mechanical
   C. Photostatic
   D. Electrostatic

3. To process your film you must use the Ozalid processing machine. Before you start the copy procedure, you set the ammonia feed system to what rate?

   A. 10-15 drops per minute
   B. 25-30 drops per minute
   C. 40-50 drops per minute
   D. 50-60 drops per minute

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4. Your VGT requires the use of flips to develop a sequence of information. Which of the following statements is TRUE concerning the use of flips?

A. Flips should only be used with black only VGTs, as they distort the colors of multicolor VGTs.
B. You should mount flips on alternating sides when you want to vary the order of presentation.
C. You should hinge the flips at the top of the VGT frame so that they will fold out of the way when not being used.
D. Flips should be mounted on one side of the VGT frame so that they will fold over the base foil in the proper order.

LESSON 2

PRACTICE EXERCISE

ANSWER KEY AND FEEDBACK

Item	Correct Answer and Feedback

1. C. 1/4 inch

   To determine the minimum lettering size, you use a nomograph. To use a nomograph, you must know the distance from the screen of the projector and of the farthest viewer (page 2-3, para 2).

2. A. Chemical

   The diazo process is the most common method of producing VGTs. The diazo process uses treated paper or foils, which you expose to ultraviolet light and develop using ammonia vapors (page 2-5, para 3b(2)).

3. D. 50-60 drops per minute

   After checking and/or filling the ammonia storage tank, you set the ammonia system feed. The procedure calls for setting the feed between 50 and 60 drops per minute. Never turn the feed off during operation (page 2-14, para 7a(l)).

4. B. You should mount flips on alternating sides when you want to vary the order of presentation.

   You hinge your flips to provide ease in presentation. When the progression of the flips is in a specific order, you hinge them on one side in the specified order. When you need flexibility, you mount them in an alternating pattern from side to side. While not considered good practice, you can hinge flips at the bottom or top of the frame. Hinging at the top is the least desirable (page 2-17, para 9).

APPENDIX A - LIST OF ACRONYMS

ACCP	Army Correspondence Course Program
C-E	Communications - Electronics
CRM	camera ready mechanicals
DA	Department of the Army
FFA	free-fire area
FLOT	forward line of own troops
HQ	headquarters
MOS	military occupational specialty
NATO	North Atlantic Treaty Organization
STANAG	standardization agreement
VGT	viewgraph transparency
VI	visual information

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APPENDIX B - PUBLICATION EXTRACT

FM 101-5-1, October 1985.

Use the above publication extract to take this subcourse. At the time we wrote this subcourse, this was the current publication. In your own work situation, always refer to the latest official publications.

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*FM 101-5-1

Field Manual
No 101-5-1

Headquarters
Department of the Army
Washington, DC, 21 October 1985

Operational Terms and Symbols

Table of Contents

*This publication supersedes FM 101-5-1, 31 March 1980; and FM 21-30, 6 May 1970.

CHAPTER 2

Symbols

The number within the hexagon ⬡ indicates the page where the definition for that symbol is located.

Section I. INTRODUCTION

GENERAL

This chapter establishes a standard system for the development of military symbols as listed in NATO Standardization Agreement (STANAG) 2019 (Edition 3). Modifications or amendments to this methodology may be made as practical experience with display techniques is acquired.

Military symbols portrayed herein are graphic aids which accurately identify items of operational interest. Departure from commonly accepted symbols should be avoided. If symbols must be improvised, their meaning should be explained in an accompanying legend. If continued use of a nonstandard symbol is required, a request for a change to this manual should be submitted.

Military symbols lose their value if they become complicated or cluttered with unnecessary detail. The examples throughout this chapter are instructional in nature and are designed for reference purposes; consequently, more information is shown than is normally required. The user must remember that simplicity, uniformity, and clarity are the keys to good military symbology.

When military symbols include words or abbreviations, the language used will be native to the country employing the symbol. When a document containing symbols is transmitted to forces of other allied nations, an explanation or translation of symbols whose meaning may cause doubt will be provided in a legend.

In general, the symbols shown in this manual are adequate also for depicting enemy units, weapons, equipment, and activities. When representing unorthodox units and equipment, the most appropriate symbol contained herein should be selected.

USE OF SYMBOLS

Military symbols depicted in this chapter are used on—

- Situation maps, overlays, overprints, and annotated aerial photographs.
- Graphic displays transmitted by automated means between US forces, between the forces of one nation and another, between national forces and an allied headquarters, and between allied headquarters.

The symbols in this chapter will *not* be used for—

- Naval plotting.
- Military geographic information and documentation.
- Telecommunications diagrams.
- Minefield records.

COLOR REPRESENTATION

Ideally, different colors are used to depict enemy and friendly symbols. Since different colors may not always be available, procedures for one-color and multi-color symbols are as follows:

One-color representation.

- Friendly symbols are outlined by a single line.
- Enemy symbols are outlined by double lines. For enemy equipment, ground environment, and activities symbols, use the abbreviation "EN" as shown on pp 2-31, 2-52, 2-53, and 2-54.

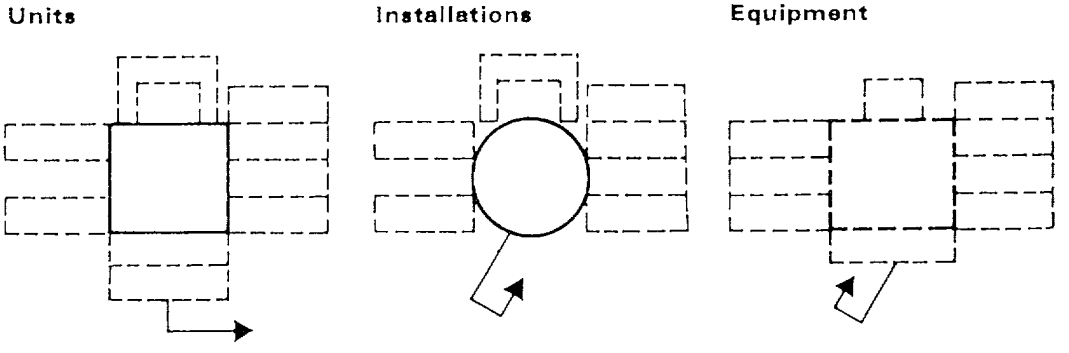
Multi-color representation.

- BLUE OR BLACK indicates friendly units, posts and installations, equipment, activities, and ground environment symbols not covered by other colors.
- RED indicates enemy units, posts and installations, equipment, and activities, and friendly fire support ground environment symbols not covered by other colors.
- YELLOW indicates friendly and/or enemy chemical or radiological areas and enemy biological areas.
- GREEN indicates friendly and/or enemy man-made obstacles.
- If other colors are used, they must be explained in a legend.
- When overlays are transmitted by facsimile, only black on white is possible. To differentiate between enemy and friendly contaminated areas or obstacles, use the abbreviation "EN" in the line that defines the area.

USE OF FIELDS

A field is a designated area around the basic symbol which is used to display a particular item of information. This information may be another symbol (such as the size indicator), words, or numbers.

Some fields apply only to friendly forces and some only to enemy forces. Some fields apply only to units, installations, or equipment. See section IV (p 2-73) for a detailed description of fields. The position of the fields in relation to the basic symbol is shown below. A field position is indicated by [ ].



Section II. DEVELOPMENT OF THE MILITARY SYMBOL

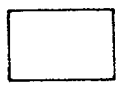
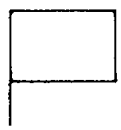
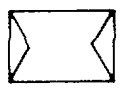
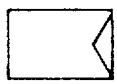
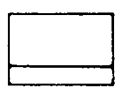
GENERAL

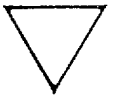
Military symbols usually consist of—

- The basic and interservice symbol.
- The unit size symbol.
- The unit role indicator symbol.
- The installation role indicator.
- Equipment indicator.
- Aviation symbol.
- Location and content of the fields surrounding the basic symbol.

BASIC AND INTERSERVICE

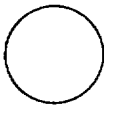
Geometric figures form the basic symbol used to represent units, installations, and activities.

Description	Symbol
Unit	
Headquarters	
Logistical, medical, or administrative installation	
Combat service support element of a theater army	
Combat service support element of a US corps	
Combat service support element of a US combat unit (brigade trains and below)	

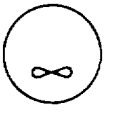
Description	Symbol
Forces under national command (associated with a size descriptor)	
Electronic installation	
Observation post 	

For interservice use, Army, Air Force, Navy, and Marine Corps are distinguished as follows:

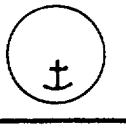
Military symbols referring to Army units, installations, and activities have no special designation.

Army logistical or administrative installation	

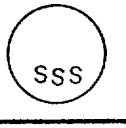
Air Force units, installations, and activities are indicated by placing the symbol ∞ within the basic symbol.

Air Force logistical or administrative installation	

Naval units, installations, and activities are indicated by placing the symbol ⚓ within the basic symbol.

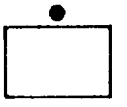
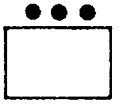
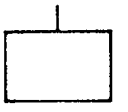
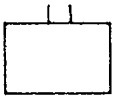
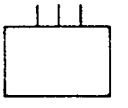
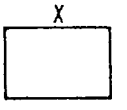
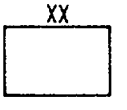
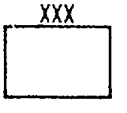
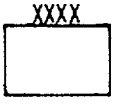
Navy logistical or administrative installation	

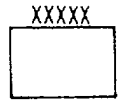
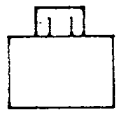
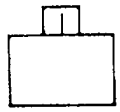
Marine Corps units, installations, and activities are indicated by the symbol SSS placed in the basic symbol.

Marine Corps logistical or administrative installation	

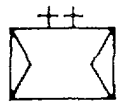
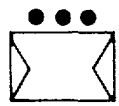
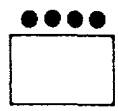
UNIT SIZE

The size of units and installations is shown by placing the appropriate size indicator directly above the basic symbol.

US Description	STANAG 2019 Description	Symbol
Squad/crew	Smallest unit/UK section	
Section or unit larger than a squad but smaller than a platoon	Unit larger than a US squad/UK section but smaller than a platoon equivalent	
Platoon or detachment	Platoon/troop equivalent	
Company, battery, or troop	Company/battery/squadron equivalent	
Battalion or squadron	Battalion equivalent	
Group or regiment	Regiment/group equivalent	
Brigade	Brigade equivalent	
Division	Division	
Corps	Corps	
Army	Army	

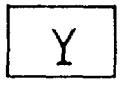
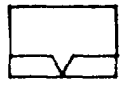
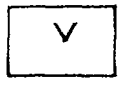
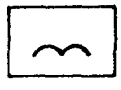
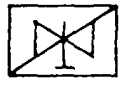
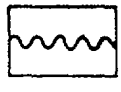
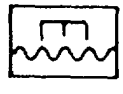
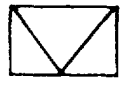
US Description	STANAG 2019 Description	Symbol
Army group or front	Army group/front	
Special size indicator for a nonorganic or temporary grouping	Battalion task force 	
	Company team 	

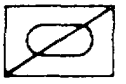
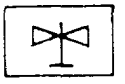
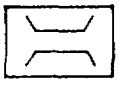
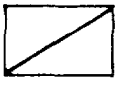
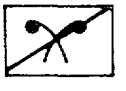
In addition to the size symbols shown above, the following apply to certain *major commands* located in the *communications zone:*

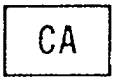
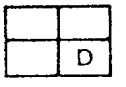
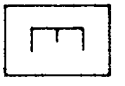
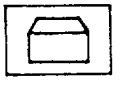
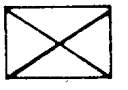
Description	Symbol
Mission command. Normally assigned to the theater army, these commands, control groups, brigades, or other organizations support the theater. (Examples: Engineer, medical, transportation, personnel.)	
Area support group of a theater army area command (TAACOM)	
Theater army area command (TAACOM)	
Theater army	

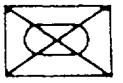
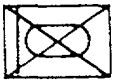
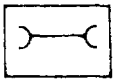
UNIT ROLE INDICATOR

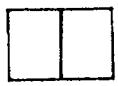
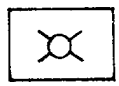
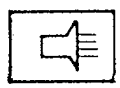
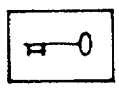
Branch or functional symbols are placed inside the basic symbol as shown on the next pages. Symbols may be combined with one another as appropriate to show the exact function (for example, the airborne symbol is used with the infantry symbol to denote airborne infantry). When no branch or functional symbol is provided, the designation or authorized abbreviated designation of the unit, or basic task of the unit, may be written inside the basic symbol.

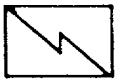
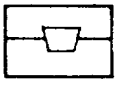
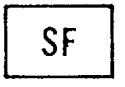
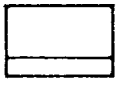
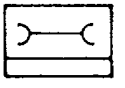
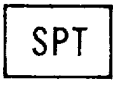
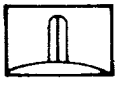
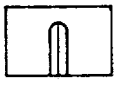
Description	Symbol
Adjutant General (personnel services and administration)	
Aerial observation	 Air Force (surveillance)  Army
Airborne 1-2 (normally associated with another branch/functional symbol)	US:  NATO: 
Air assault 1-1 (air assault unit that has sufficient aircraft to perform air assault missions)	 
Air assault 1-1 (units organic or assigned to air assault divisions and trained in air assault operations but without sufficient aircraft to perform air assault missions)	 
Air cavalry	
Air defense	
Amphibious	
Amphibious engineer	
Antiarmor	

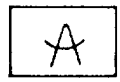
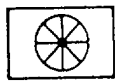
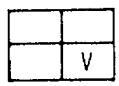
Description	Symbol
Armor	
Armored cavalry	
Army aviation Rotary wing	
Fixed wing	
Attack helicopter	
Bridging	
Cavalry or reconnaissance	
Chemical (NBC)	
Chemical (NBC decontamination)	
Chemical (reconnaissance)	

Description	Symbol
Chemical (smoke generator)	
Civil Affairs (US only)	
Data processing unit	
Dental	
Engineer	
Electronic warfare	
Field artillery	
Finance/Pay	
Infantry	
Light	

Description		Symbol
Infantry (cont)	Mechanized APC	
	*BIFV (mounted)	
	*BIFV (dismounted) *See p. 2-72	
	Motorized	
Labor resources		
Maintenance		
Medical		
Meteorological		
Military Intelligence (at corps and below insert is CEWI)		
Military Police		

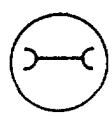
Description	Symbol
Motorized	
Mountain	
Ordnance	
Petroleum supply	
Psychological operations	
Quartermaster	
Ranger	RGR
Replacement/reinforcement holding unit (NATO)	RHU
Rocket artillery	
Service	SVC

Description	Symbol
Signal/communications	
Sound ranging	
Special forces	
Supply	
Supply and maintenance	
Supply and transportation	
Support	
Surface-to-air missile	
Surface-to-surface missile	
Survey	

Description	Symbol
Topographic	
Transportation	
Unmanned air reconnaissance (RPV, etc)	
Veterinary	

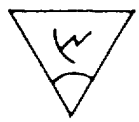
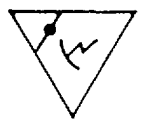
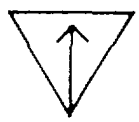
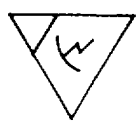
INSTALLATION ROLE INDICATOR

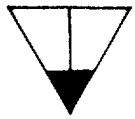
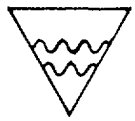
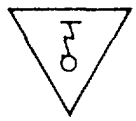
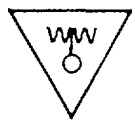
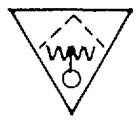
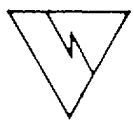
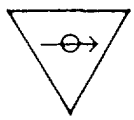
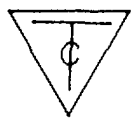
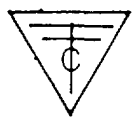
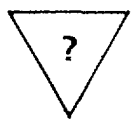
Collecting points. 1-15

Description	Symbol
Cannibalization	
Civilian	
Decontamination station (below symbol indicate personnel (PERS) or equipment (EQUIP) or both)	
Maintenance	

Description	Symbol
Prisoners of war	EPW
Salvage	SALV
Stragglers	S

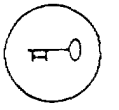
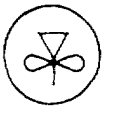
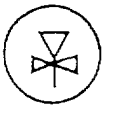
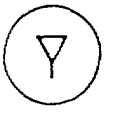
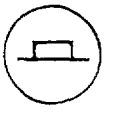
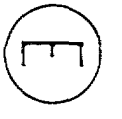
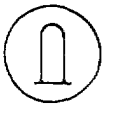
Communications and electronics

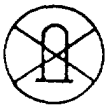
Description	Symbol
Air defense radar	
Artillery locating radar	
Automatic data processing central	ADP
Direction finding	
Electronic warfare 	EW
Ground sensor/ground surveillance radar	

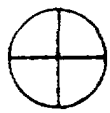
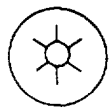
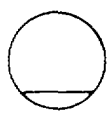
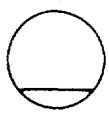
Description	Symbol
Intercept	
Jamming 1-39	
Radio relay station	
Radio/wireless station	
Radio/wireless station (dummy)	
Signal/communications center	
Target designator (for example, laser, IR)	
Telephone center or telephone switching central *not at a HQ or HQ echelon*	
Teleprinter center	
Unknown	

2-15

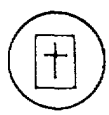
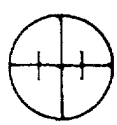
Logistics. 1-14

Description	Symbol
Class I—Subsistence	
Class II—Clothing, individual equipment, *tentage, organizational tool sets*	
Class III—POL	
Air Force	
Army aviation	
Ground	
Solid fuel (coal or wood)	
Class IV—Construction	
Class V—Ammunition	
All types *(less special)*	
Air defense	

Description	Symbol
Class V—Ammunition (cont)	
Air Force	
1-5 Ammunition transfer point	
Army aviation	
Artillery (gun/howitzer)	
Chemical	
Mines and explosives	
Nuclear	
Rocket artillery	
Small arms	
Tank, main gun	

Description	Symbol
Class VI—Personal demand	
Class VII—Major end items	
Class VIII—Medical materiel	
Class IX—Repair parts	
Class X—Materiel to support nonmilitary programs	
All classes	
Multiple classes but not all (list available classes by number below the "all classes" symbol)	

Miscellaneous.

Description	Symbol
Graves registration service	
Hospital/aid station	

Description	Symbol
Material management center	
Parking	
Topographic (map)	
Traffic control	
Water	

EQUIPMENT INDICATOR

Weapons. Symbols are used to indicate the type and location of a weapon or group of weapons. When a weapon symbol appears on a map or overlay, the base of the shaft indicates the location of the weapon. To show the approximate size of a particular weapon, the procedure is as follows:

Select the appropriate weapon symbol.

 (light automatic weapon)	 (gun)

Add horizontal bars (one for medium or two for heavy) to denote the size.

 (medium machine gun)	 (heavy gun)

If a weapon has a high trajectory, a ○ is placed at the base of the shaft. If the weapon has a flat trajectory, a ∧ is placed at the base of the shaft.

(medium mortar)

(light antitank gun)

If the weapon is primarily for air defense, a ⌓ is placed at the base of the shaft.

(air defense missile)

(air defense gun)

If the weapon is rocket launched, a ⩓ is placed at the head of the shaft. If a weapon is also a tracked, self-propelled vehicle, a ⬭ is placed below the weapon symbol.

(rocket launcher)

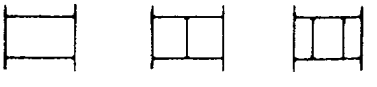
(a tracked, self-propelled medium howitzer)

Examples of weapons symbols are shown below.

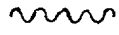
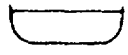
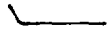
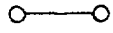
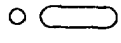
Description	Symbol		
	LIGHT	MEDIUM	HEAVY
Air defense gun			
Antitank gun			
Antitank missile, self-propelled			
Antitank rocket launcher			

Description	Symbol		
	LIGHT	MEDIUM	HEAVY
Flamethrower	 portable	 vehicular	
Gun in air defense role, self-propelled			
Gun in antitank role			
Howitzer			
Machine gun/automatic weapon			
Mortar			
Multibarrel rocket launcher			
Surface-to-air missile			
Surface-to-surface missile			

Vehicles. Except for armored vehicles, symbols for vehicles are made by combining two types of symbols—one for the body type, the other for the means of mobility.

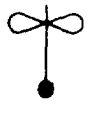
Description	Symbol
Amphibious (cargo)	
Armored personnel carrier (APC)	
Armored engineer vehicle	
Armored vehicle launch bridge (AVLB)	
Bradley infantry fighting vehicle (BIFV)	
Cavalry fighting vehicle (CFV)	
Hovercraft	
Multi-purpose engineer tractor	
Tank	Light Medium Heavy 

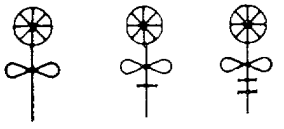
Mobility.

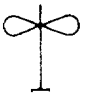
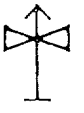
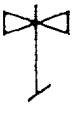
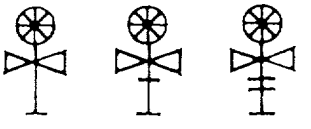
Description	Symbol
Amphibious	
Barge or boat	
Over-snow (prime mover)	
Towed vehicle or trailer	
Tracked or self-propelled	
Wheeled	
Wheeled cross-country	
Wheeled/tracked combination	

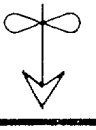
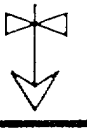
AVIATION

For Air Force aircraft, a  is used. For Army aircraft, a  is used.

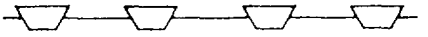
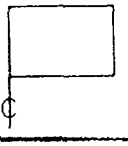
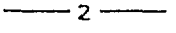
Description	Symbol	
	Air Force	Army
Fixed wing		
Bomber		
Fighter		

Description	Symbol	
Fixed wing (cont)	Air Force	Army
Reconnaissance		
Transport/lift	 Light Medium Heavy	

Description	Symbol	
Helicopter	Air Force 	Army 
Attack		
Reconnaissance		
Transport/lift		 Light Medium Heavy

Description	Symbol	
Remotely piloted vehicle (RPV) 1-61	Air Force 	Army 

COMMUNICATION AND ELECTRONIC EMITTERS

Description	Symbol
Facsimile apparatus	
Microphones (This symbol may be used for sound ranging microphones. Each quadrilateral of the symbol indicates a microphone.)	
Multichannel cable	
Multichannel radio terminal (number of channels indicated between vertical lines of the symbol)	
Radio/wire integration station, FM	
Telephone switching central at a HQ or HQ echelon	
Teleprinter or teletypewriter apparatus	
Television	
Wire circuit, indicating number of pairs available	

Section III. SYMBOLS FOR THE GROUND ENVIRONMENT

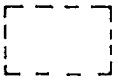
GENERAL

Situation maps and overlays provide a rapid and easily understood means by which a commander or staff officer may express an operational plan, concept, or friendly or enemy situation. The combination of unit and weapon symbols with objectives, boundaries, routes of march, and other control measures creates an indispensable tool for quickly and accurately portraying battle activity. Standardization of techniques is essential if tactical information is to be relayed without misunderstanding. Guidelines for the pictorial representation of tactical situations are, therefore, established in this section. ***Graphics*** explained in this section include—

- Locations.
- Points, lines, and areas.
- Routes, obstacles, crossings, movements, and fire planning.
- NBC.
- Tactical deception.
- Battlefield activities.

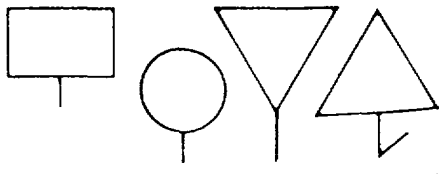
PRESENT AND PROPOSED LOCATIONS

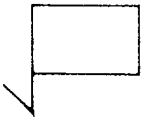
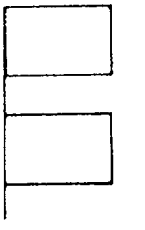
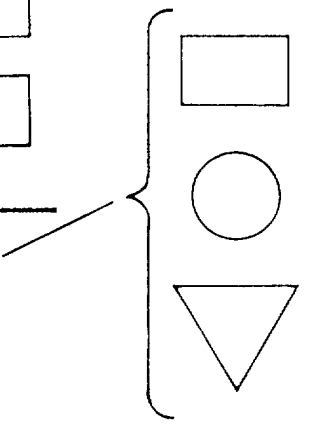
Basic unit and installation symbols are drawn with either solid or broken lines. The center of mass of the symbol indicates the general vicinity of the center of mass of the unit. If a staff is added to identify a headquarters, the base of the staff indicates the precise location of the headquarters.

Description	Symbol
A solid line symbol represents a present or actual location.	
A broken line symbol indicates a future or projected location.	

PRECISE LOCATIONS

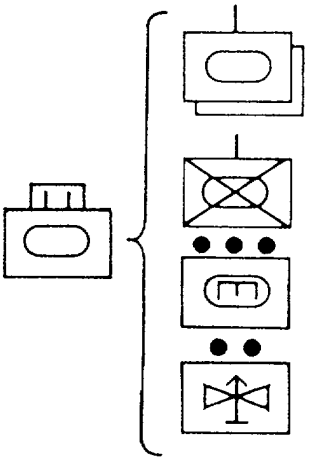
To indicate locations more precisely, the following methods are employed:

Description	Symbol
Basic symbols other than the headquarters symbol may be placed on a staff which is extended or bent as required. The end of the staff indicates the precise location.	

Description	Symbol
Since the headquarters symbol already includes a staff, this staff may be extended or bent as required. The end of the staff, or the end of the extension (if used), indicates the exact location of the headquarters.	
If several headquarters are at one location, more than one symbol may be placed on a single staff.	
If a group of units or installations other than headquarters is at one location, the grouping of symbols may be enclosed with a bracket and the exact location indicated with a staff.	

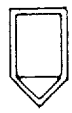
TASK FORCE LOCATIONS

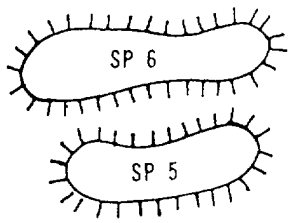
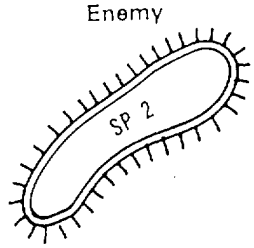
Units forming a temporary grouping may be shown under one command by use of a bracket.

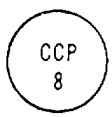
Description	Symbol
An armored battalion task force formed by two tank companies, one mechanized infantry company, one armored engineer platoon, and one aviation section	

POINTS

A point of military interest on a map or diagram is indicated by one of the following:

Description	Symbol	
	Own	Enemy
General or unspecified point (Exact location is the tip at the bottom of the symbol)		
Coordinating point (Exact location is the center of the symbol) 1-20		
Contact point 1-18		
Start point 1-67		
Release point 1-61		
Earthwork, small trench, fortification		
Surface shelter		
Underground shelter		

Description	Symbol	
	Own	Enemy
Strongpoint (May be combined with unit size symbol) 1-67		

Description	Symbol
Air control point (ACP) 1-2	
Airfield (Army) (The tip at the bottom of the symbol denotes the exact location)	
Checkpoint 1-13	
Communications checkpoint 1-17	
*Collecting point	*See examples on pages 2-13 and 2-14.*
Linkup point 1-42	
Passage point 1-54	

Description	Symbol
Point of departure 1-55	PD
Pop-up point 1-55	PUP
Rally point 1-59	RALLY
Rendezvous point (Letter in circle appears in alphabetical sequence for number of points required)	A RDVU
Traffic control point 1-73	

LINES

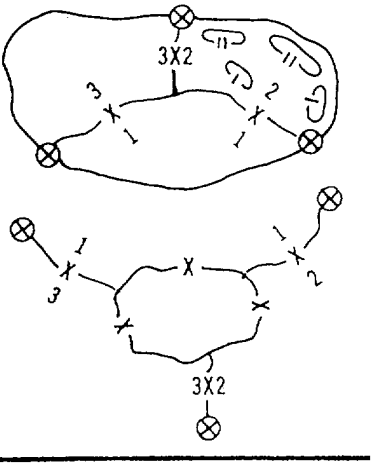
A line connects two given points directly or by means of intermediate points indirectly. It is determined by at least two grid references.

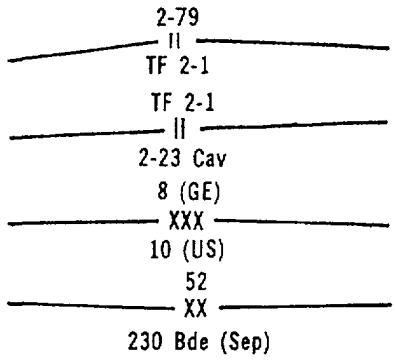
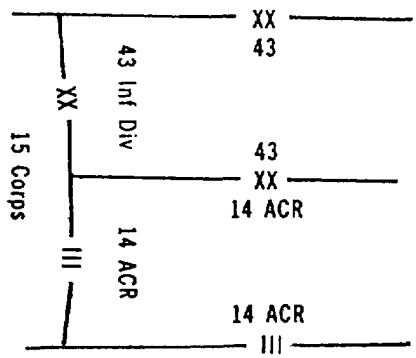
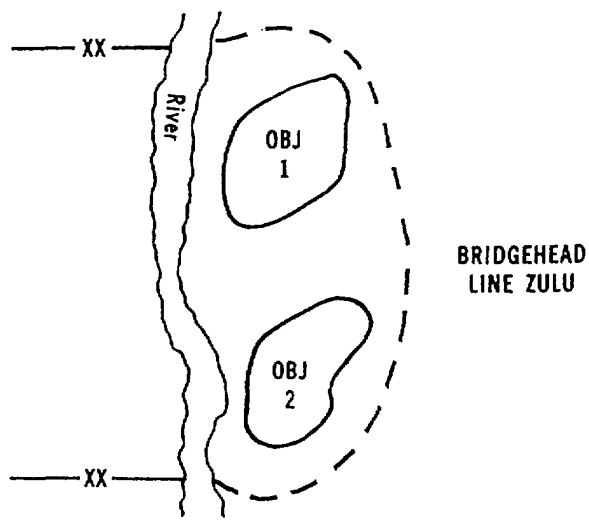
Basic.

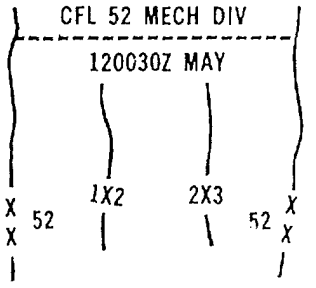
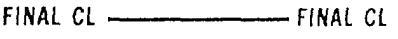
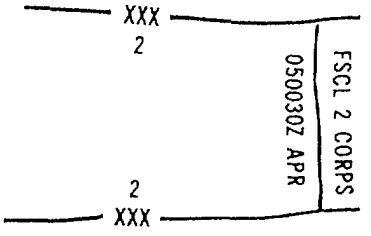
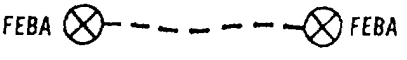
Description		Symbol
Front lines	Own present	
	Own planned	
	Enemy present	

Description		Symbol
Front lines (cont)	Enemy anticipated or suspect	
General tactical boundary	Own present	XX
	Own planned	XX
	Enemy present	EN III EN
	Enemy anticipated or suspect	EN III EN
Obstacle line (Tips point toward the enemy)		
Fortified line		

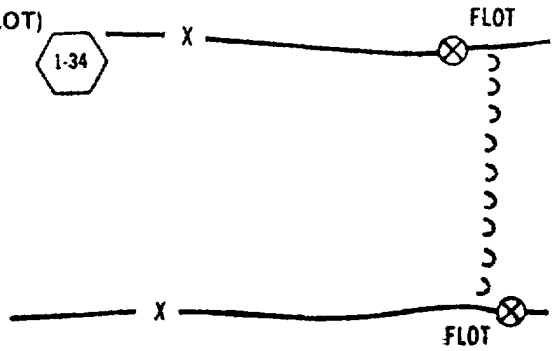
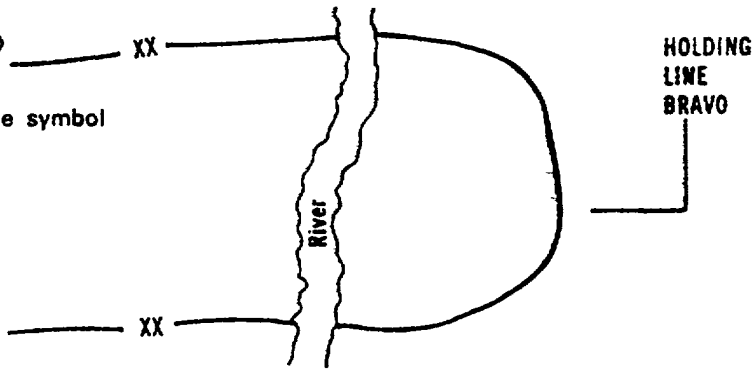
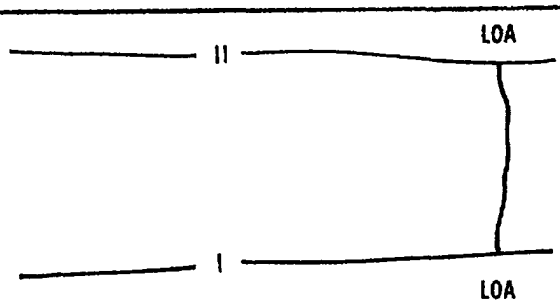
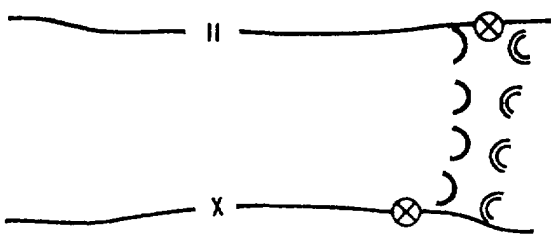
Control.

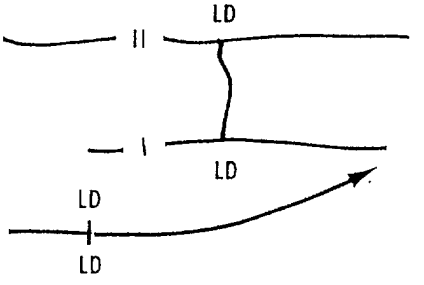
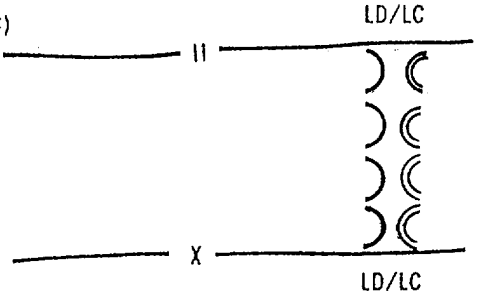
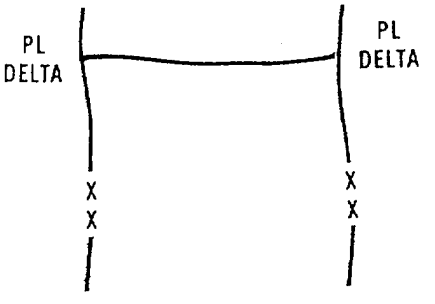
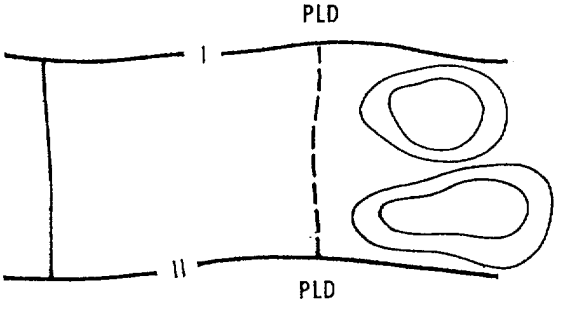
Description	Symbol
Airhead line 1-3 May be used as a control measure to delineate the location of battle positions when forces are deployed linearly in sector as in a perimeter defense, — or — May be used to limit the depth of enemy penetrations when units defend in depth. In this case, the airhead line can constitute brigade rear boundaries.	

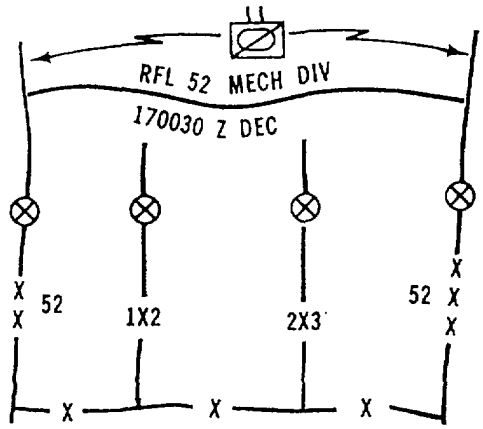
Description	Symbol
Boundary 1-11 **Lateral boundaries** 1-12 Lateral boundaries are lines with a symbol placed on the boundary to show size and designation of the highest echelons that have the boundary in common. If the units are of unequal size, the symbol of the higher units is shown and the designation of the lower unit is given completely.	
Rear boundaries 1-12 When used, a rear boundary shows the size symbol for the smaller or subordinate unit rather than that of the larger unit of which it is a part.	
Bridgehead line General bridgehead line symbol 1-12	

Description	Symbol
Coordinated fire line (CFL) 1-19 A CFL (denoted by a broken black line) may or may not appear on the operation overlay, but must appear on target overlays, situation maps, and firing charts of all supporting artillery. DTG indicates time the CFL becomes effective.	
Final coordination line (CL) 1-31	
Fire support coordination line (FSCL) 1-32 An FSCL is designated by a black line extending across the assigned areas of the establishing headquarters. The indicator of the establishing headquarters is shown after the letters FSCL.	
Forward edge of the battle area (FEBA) 1-34 General FEBA symbol	
Proposed trace of FEBA	
Actual trace of FEBA	

2-33

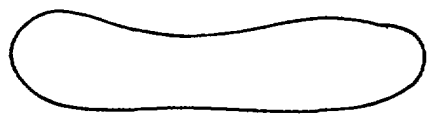
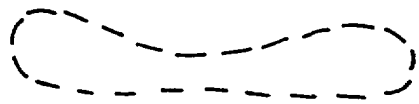
Description	Symbol
Forward line of own troops (FLOT) 1-34 General FLOT symbol	
Holding line 1-37 General holding line symbol	
Limit of advance (LOA) 1-42 General LOA symbol The symbol is depicted by drawing a line along an easily identifiable terrain feature	
Line of contact (LC) 1-42 General LC symbol Enemy symbols depicted with double lines when not portrayed in color.	

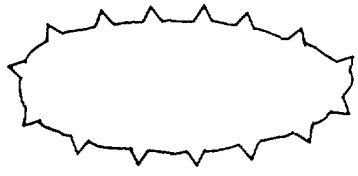
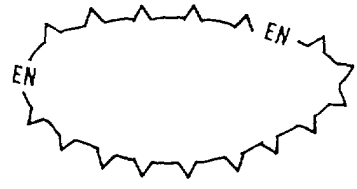
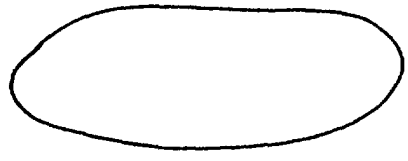
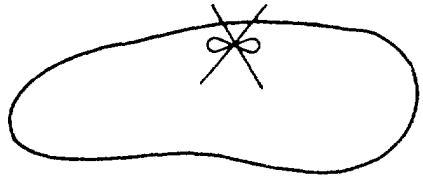
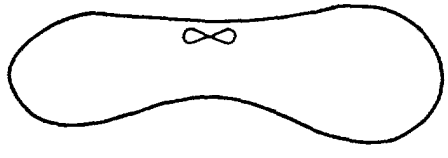
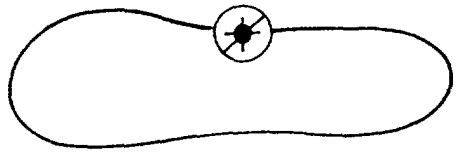
Description	Symbol
Line of departure (LD) 1-42 General LD symbol The symbol is a solid line generally perpendicular to the direction of attack with the letters LD at either end.	
Line of departure is line of contact (LD/LC) General LD/LC symbol 1-42	
Phase line (PL) 1-55 Phase lines are labeled "PL" and assigned letters, numbers, or code name designations.	
Probable line of deployment (PLD) General PLD symbol 1-57 The symbol is a dashed line with letters PLD at both ends	

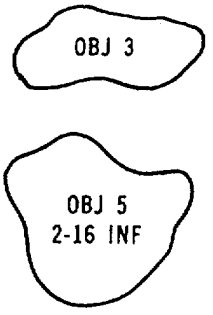
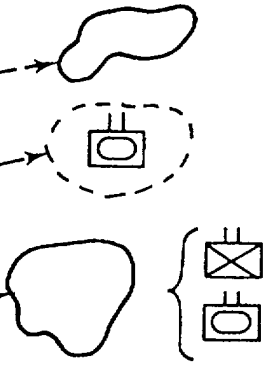
Description	Symbol
Restrictive fire line (RFL) 1-62 The RFL is graphically depicted in red with the identification of the establishing command and the effective DTG denoted.	

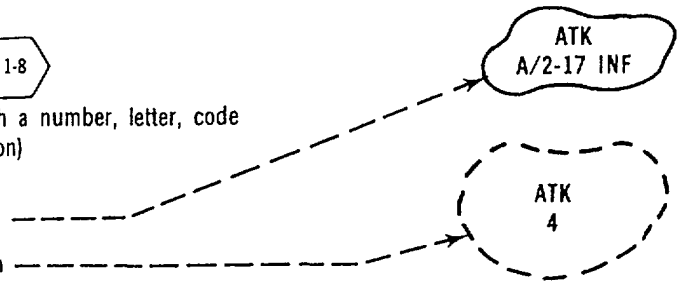
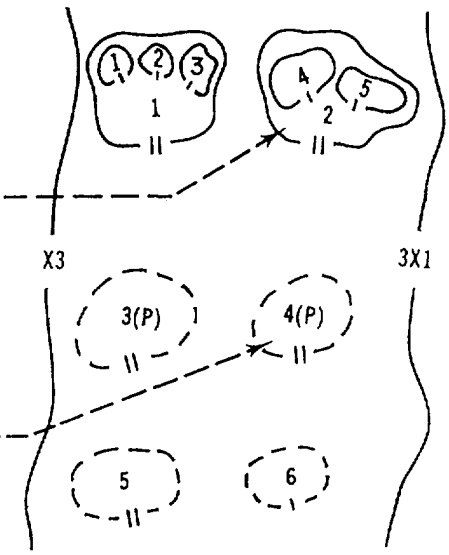
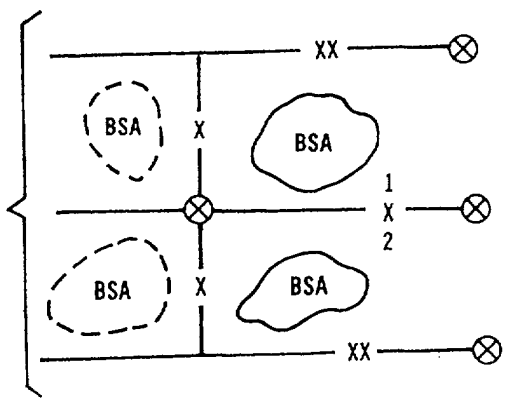
AREAS

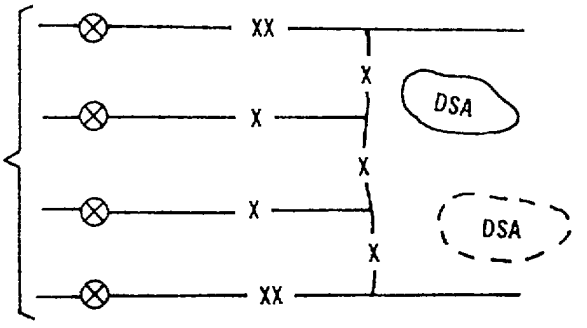
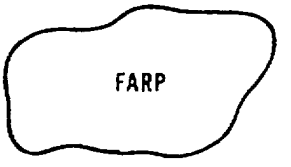
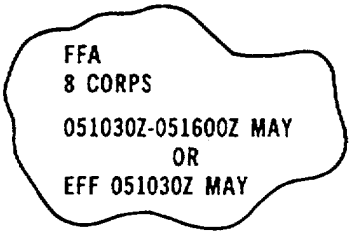
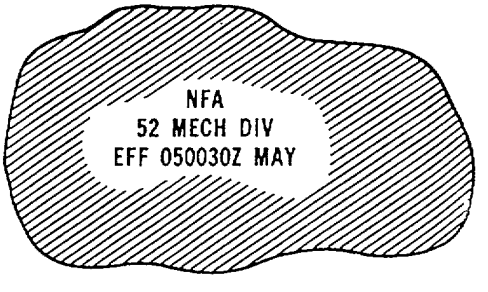
An area is a designated piece of terrain or space specified by an irregular line. The activity taking place within the area is indicated by writing letters and/or numbers within the irregular line.

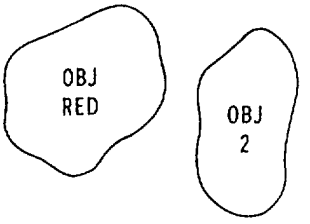
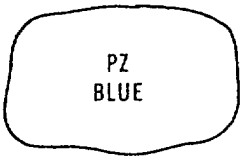
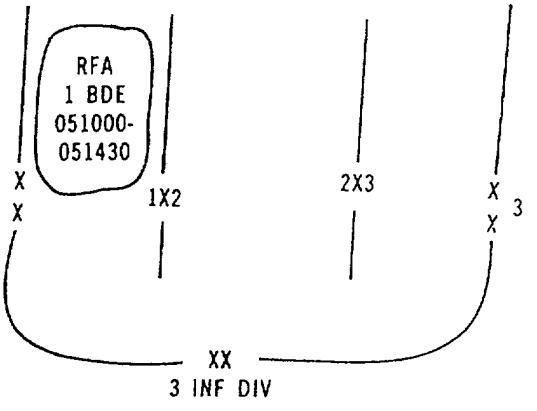
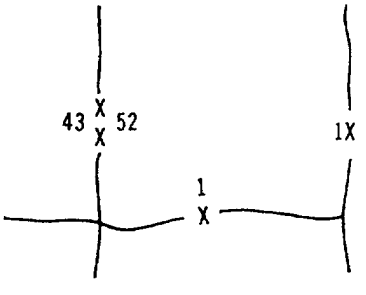
Description	Symbol
Basic or unspecified Own present	
Own planned	
Enemy present	
Enemy anticipated or suspect	

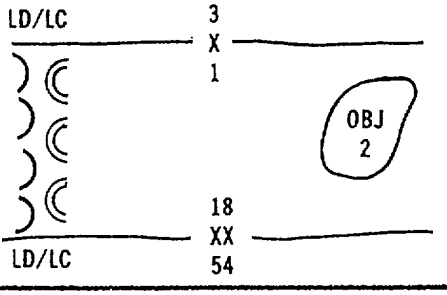
Description	Symbol
Limited access Own present	
Enemy present	
Fortified	
Control Airfield zone (Flying inside area only)	
SHORAD zone (No go for own aircraft inside the area)	
Vulnerable area (Air will encounter enemy air defense weapons)	

Description	Symbol
Control (cont) Airspace coordination area (ACA) 1-4 General ACA symbol (Rectangle outline is colored red)	ACA 23d Mech Div MIN ALT: 500 MAX ALT: 3000 EFF: 281400ZAPR 282030ZAPR
Assault objective 1-7 General assault objective symbol Objectives and intermediate objectives are enclosed and contain the abbreviation OBJ, with a letter, number, code name, or unit designation.	
Assault position 1-7 Assault positions are enclosed and contain the abbreviation ASLT PSN, with a letter, number, code name, or a unit designation.	
Assembly area 1-7 (May be designated by numbers, letters, code names, or unit designations) Occupied assembly area Planned assembly area for a battalion Unit symbols displaced to indicate an assembly area for a group of units	

Description	Symbol
Control (cont)	
Attack position (1-8)	
(May be designated with a number, letter, code name, or unit designation)	
Actual attack position, A Co, 2d Bn, 17th Inf	
Proposed attack position	
Battle position (BP) (1-10)	
Occupied co BP identified at bn level as BP5. At bde level, this BP is referred to in conjunction with the bn BP as BP2-5. (P) following a position number indicates a prepared position.	
Prepared bn BP for future occupation. Within the 3d Bde it would be identified as BP4.	
Brigade support area (BSA) (1-12)	
General BSA symbols	
Occupied and proposed BSA	

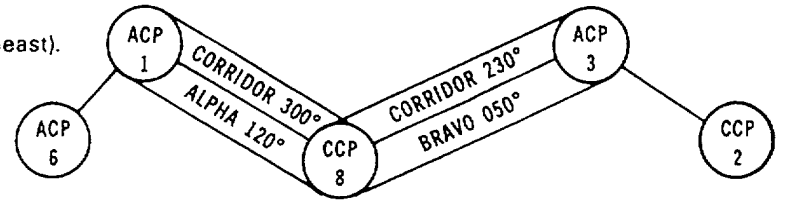
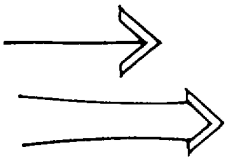
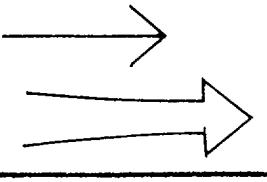
Description	Symbol
Control (cont) Division support area (DSA) 1-26 General DSA symbol Occupied and planned DSAs	
Forward arming and refueling point (FARP) 1-33 General FARP symbol	
Free fire area (FFA) 1-34 Designated area outlined in black is the FFA	
Landing zone (LZ)/drop zone (DZ) 1-41 1-27 General LZ/DZ symbol	
No-fire area (NFA) 1-50 The NFA is the designated area outlined in red which has red diagonal lines within the outlined area. DTG indicates the time the NFA becomes effective.	

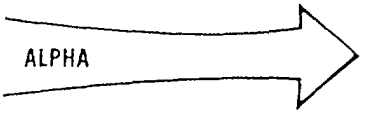
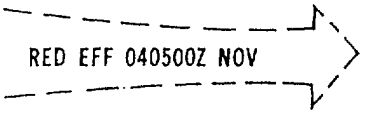
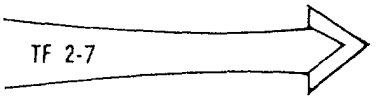
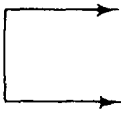
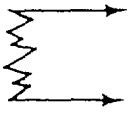
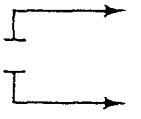
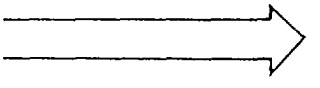
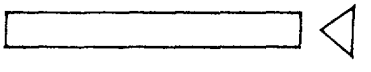
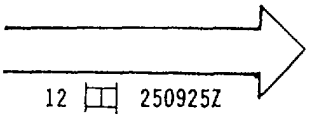
Description	Symbol
Control (cont)	
Objective (1-50) General objective symbol is depicted by a line enclosing the abbreviation "OBJ" and a letter, name, or number designation.	
Pickup zone (PZ) (1-55) General PZ symbol	
Restrictive fire area (RFA) (1-62) The RFA is outlined in red.	
Sector (1-64) Sector assigned the 1st Bde, 52d Mech Div	

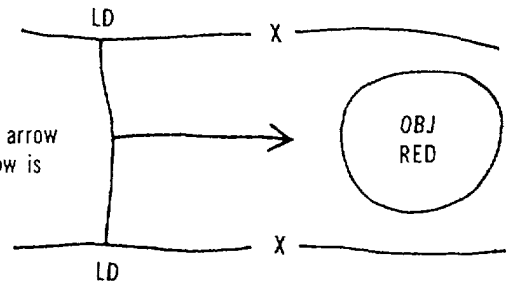
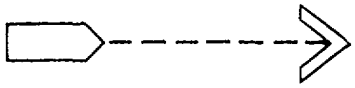
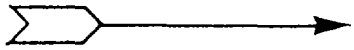
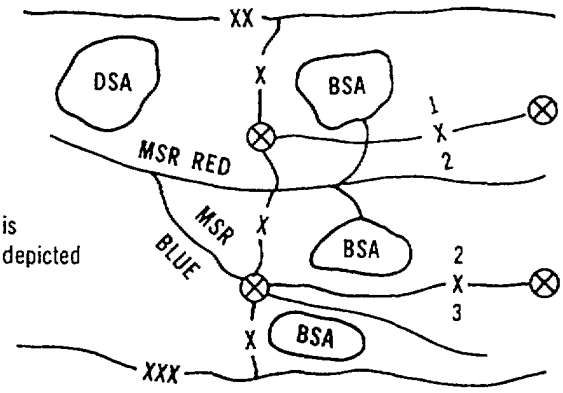
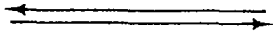
Description	Symbol
Control (cont.) Zone of action (1-75) General zone of action symbol is designated by boundaries drawn on either flank of the zone.	

ROUTES (1-62)

A route is a line undefined in each direction. As soon as a direction is shown, a route becomes a nonstatic activity.

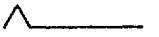
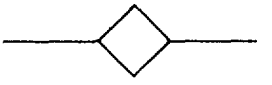
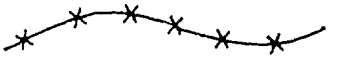
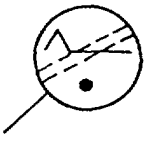
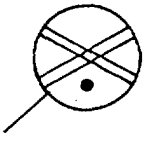
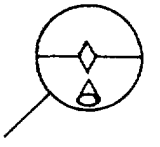
Description	Symbol
Air corridor (1-2) (flying east turn southeast).	
Attack (1-8) General symbol for main attack—double arrowhead	
General symbol for other than main attack—single arrowhead	
Double arrowhead for direction of main attack and axis of advance for the main attack	
Single arrowhead for supporting direction of attack and supporting axis of advance	

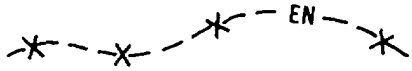
Description	Symbol
Axis of advance (1-8) Actual	
Proposed with date and time effective	
Axis of advance for unit designated to conduct main attack	
Bypass (1-12) Bypass easy	
Bypass difficult	
Bypass impossible	
Convoys (1-19) Arrow indicates direction of movement. Point of arrow indicates head of convoy.	
If the convoy is halted, the arrow is shown facing toward the rear of the column.	
This symbol may be shown with the appropriate vehicle symbol to indicate the type and number of vehicles in the column. Likewise, the date and time may be added. (A column of 12 medium tanks at 0925Z on the 25th)	
Light line (LL) (1-42)	

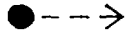
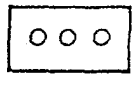
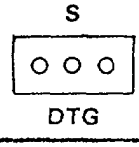
Description	Symbol
Direction of attack. (1-25) Direction of attack is shown graphically as an arrow extending from the line of departure. The arrow is not normally labeled.	
Follow and assume main attack	
Follow and support mission	
Main supply route (MSR) (1-44) A main supply route is labeled "MSR" and is assigned a code name. Proposed MSRs are depicted using dashed lines.	
Routes of communication One-way traffic	
Alternating one-way traffic	
Two-way traffic	

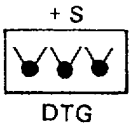
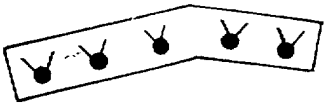
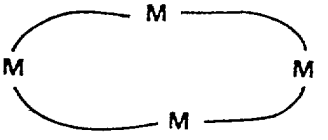
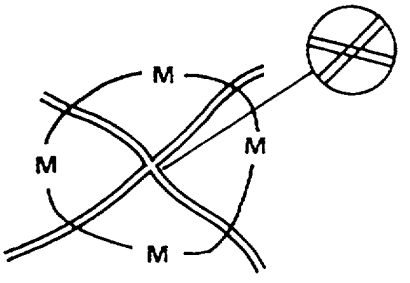
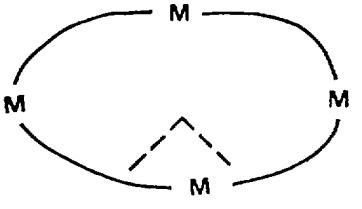
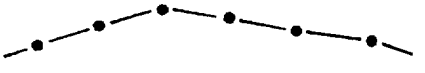
OBSTACLES (1-51)

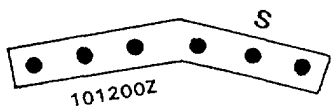
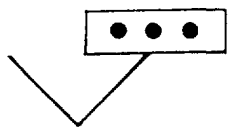
Obstacles are divided into four types—point, demolitions, linear, and minefields. The following obstacle indicators can be superimposed on either point or linear obstacle symbols. (More detailed symbology is required for use by engineers and low level tactical commanders, and also for use in target folders, minefield records, and instructional manuals.)

Description	Symbol
Abatis (1-1)	
Booby trap (1-11)	
Nonexplosive antitank	
Trip wire	
Wire	
Point Planned abatis reinforced with antipersonnel mines	
Executed or fired demolition reinforced with antitank mines	
Booby-trapped nonexplosive antitank obstacle with target serial number	

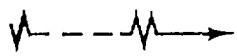
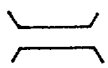
Description	Symbol
Demolitions Planned target demolition	
Prepared demolition state 1 (safe)	
Prepared demolition state 2	
Fired demolition	
Atomic demolition	
Linear Antitank ditch (A rectangle need not be used when the obstacle is drawn to scale on the overlay. Teeth point toward the enemy.)	 Under preparation Completed
Unspecified	
Wire (enemy under preparation)	

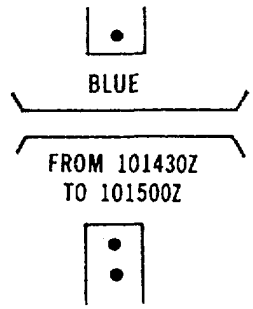
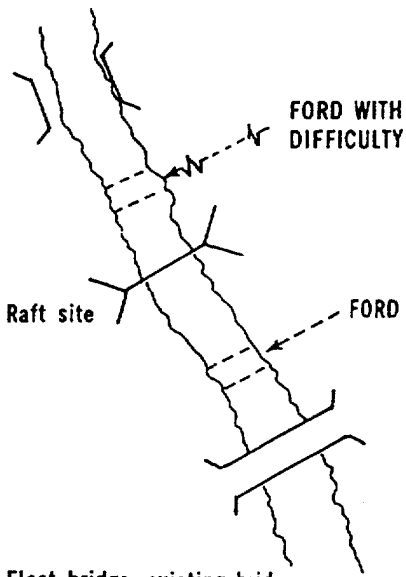
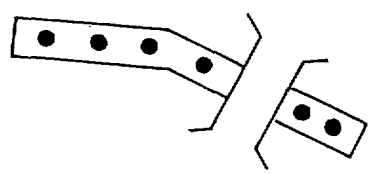
Description	Symbol
Minefields (1-46) Indicators Antipersonnel mine	
Antitank mine	
Antitank mine with antihandling device	
Directional mine (arrow points in direction of main effect)	
Mine cluster	
Mine, type unspecified	
Conventional A planned minefield consisting of unspecified mines	
A completed minefield consisting of unspecified mines	
Scatterable minefield (1-63) (DTGs used for self-destruct mines)	

Description	Symbol
Conventional (cont) Conventional minefield thickened with scatterable mines (1-63)	
Conventional row mining (outline drawn to scale)	
Nuisance Nuisance minefield	
Demolished crossroads with nuisance mines	
Phony Phony minefield	
Protective Protective minefield	
Antitank ditch reinforced with antitank mines	

Description	Symbol
Tactical Tactical minefield of scatterable antitank mines, effective till 101200Z	
Completed antitank minefield (drawn away from the location and connected by a vector)	

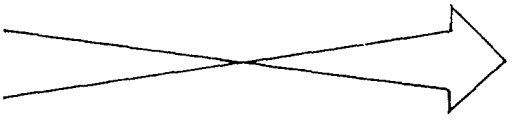
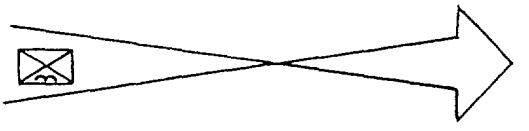
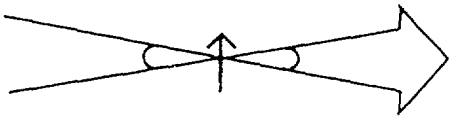
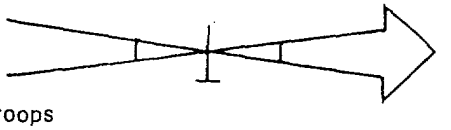
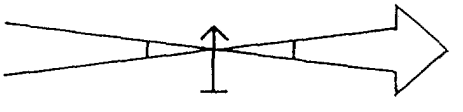
CROSSINGS

Description	Symbol
Assault 1-6	
Ferry	
Ford 1-33	
Ford with difficulty	
Gap or bridge 1-35	
Lane 1-41	
Raft site	

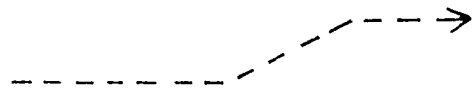
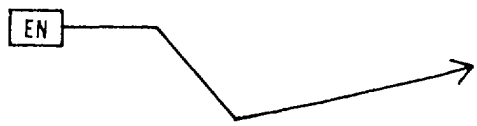
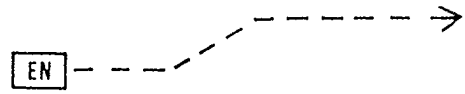
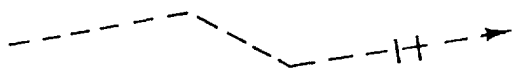
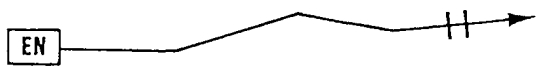
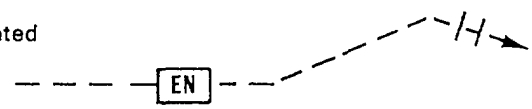
Description	Symbol
Crossings (cont) A crossing between a friendly minefield belt, code name BLUE. Effective from 101430Z to 101500Z.	
Crossing site 1-21 General crossing site symbols	Assault crossing  Float bridge, existing bridge site, or viaduct
Gap in conventionally laid antitank minefield	

MOVEMENTS

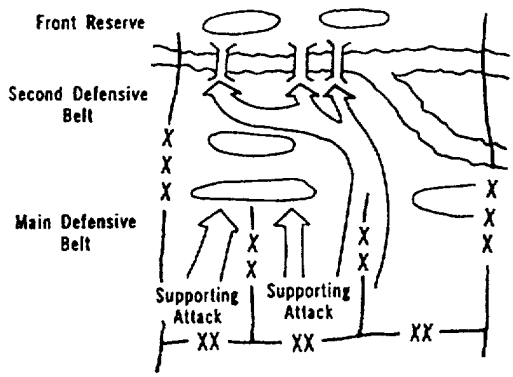
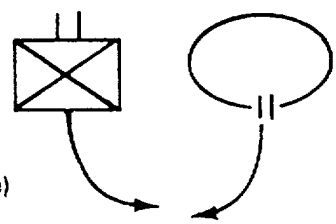
Movements are classified as general or specific. A general movement for aircraft (a route) is symbolically represented by an air corridor while general ground movement is represented by boundaries. Specific air and ground movement symbols are used to control the direction of the movement. Examples of these symbols follow.

Description	Symbol
Axis of advance 1-8	Air  General
	 Airborne force
	 Air Force aircraft
	 With assaulting troops (Army helicopter)
	 Army attack aircraft only

Description	Symbol
Axis of advance (cont)	Ground
	Own present
	Own planned
	Enemy present
	Enemy anticipated or suspect
Direction of attack	Air
1-25	Own present
	Own planned
	Enemy present
	Enemy anticipated or suspect

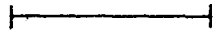
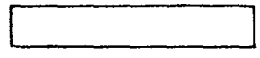
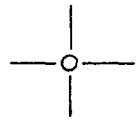
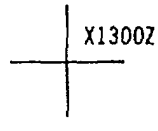
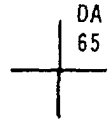
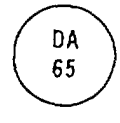
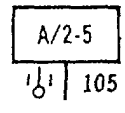
Description	Symbol
Direction of attack (cont)	Ground Own present  Own planned  Enemy present  Enemy anticipated or suspect 
Delaying action This symbol showing direction of movement is related to a unit performing delay. The cross lines do not denote any actual position, but are always placed near the arrowhead.	Own present  Own planned   Enemy present Enemy anticipated or suspect 

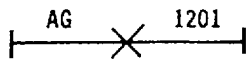
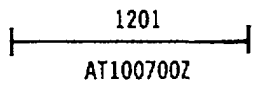
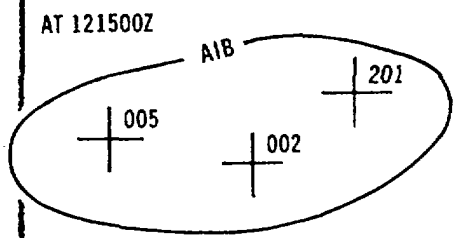
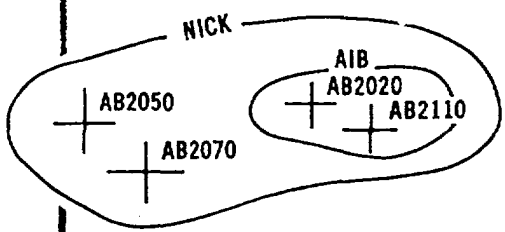
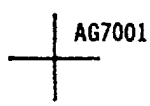
2-53

Description	Symbol
Reconnaissance	Own present
	Own planned
	Enemy present EN
	Enemy anticipated or suspect EN
Turning movement 1-73	 General turning movement symbol
Withdrawal 1-75	 General symbol for withdrawal (Arrow shows withdrawal route)

FIRE PLANNING

Fire planning symbols follow the rules for either points or lines.

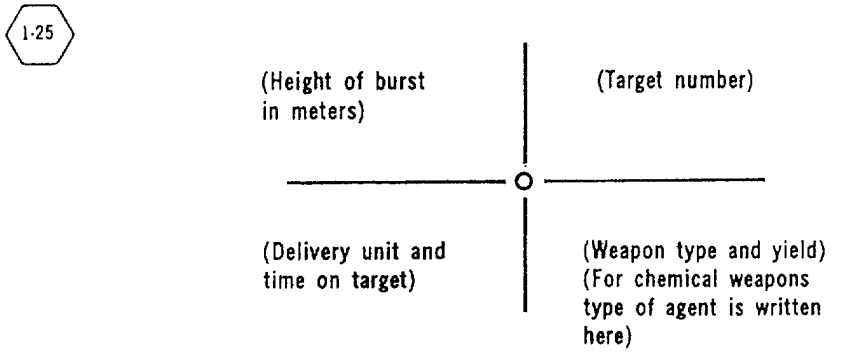
Description	Symbol
Basic Concentration/point	
Linear concentration/line	
Rectangular target	
Nuclear target/point	
Target reference point (TRP) 	
Concentrations and barrages Friendly concentrations are normally identified by letter prefix and number. Additionally, concentrations may be labeled to show the type of target, type of weapon and fires, duration and time of fires, and the unit designated to fire the mission.	  Concentration Alternate method
Barrages are usually plotted to scale and shown as a rectangle. The unit designated to fire the barrage may be indicated inside the rectangle.	 105-mm barrage to be fired by Btry A, 2d Bn, 5th Arty

Description	Symbol
Concentrations and barrages (cont) Linear concentration	
Targets and final protective fires Friendly targets (not enemy) are represented by one of the following symbols, as *appropriate. Targets for friendly fires are* normally designated using two letters followed by four numbers. For additional information on these symbols used by US forces, see *FM 6-20.*	
A linear concentration, target number 1201, on a friendly target effected at 100700Z	
A group of targets, under the code name AIB, effective at 121500Z 	
Series of targets 	
Target 	

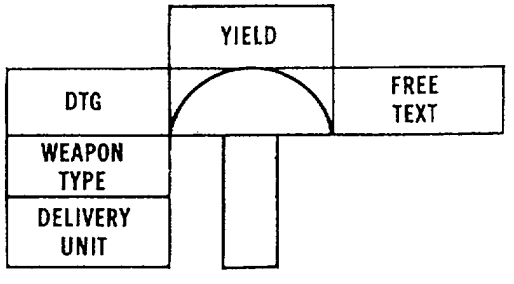
Description	Symbol
Rectangular target	AG 7003
Area target	AG 7004
Final protective fire (identified by unit designation)	A/1-3

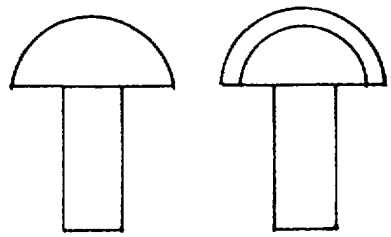
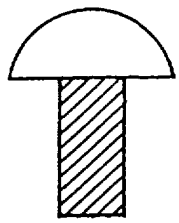
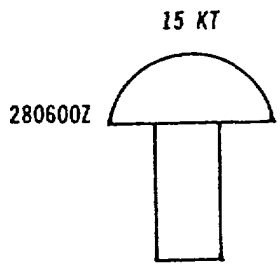
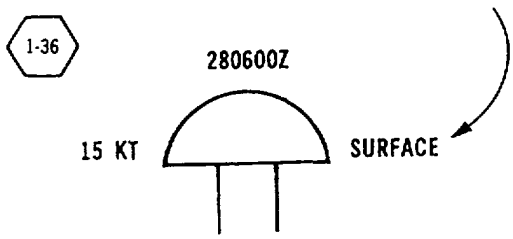
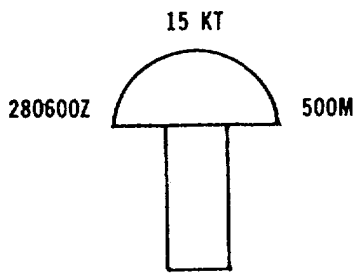
NBC

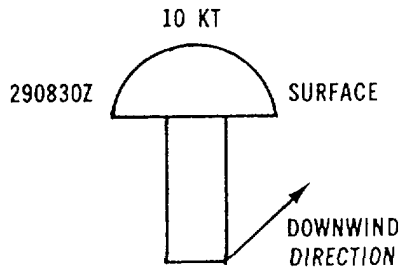
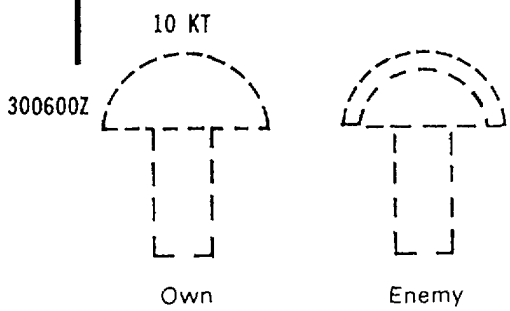
The symbol used for special weapons targets is the tick mark. The dot shows the exact location of the ***desired ground zero.*** Additional information may be included as shown below.



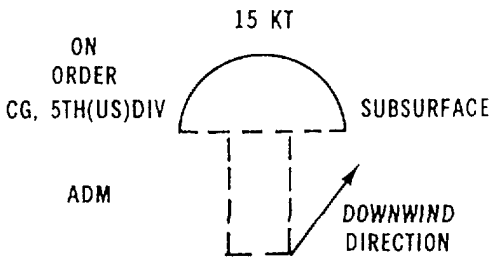
Fields used with symbols for nuclear explosions are shown below. The base of the stem indicates the point of detonation.



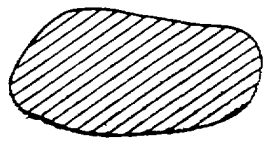
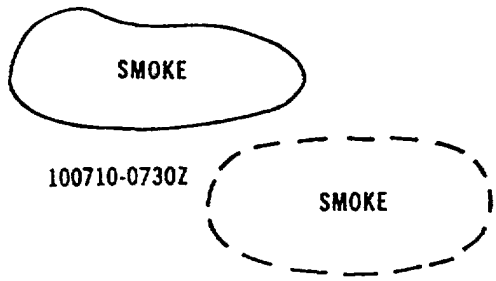
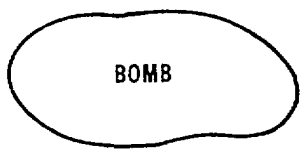
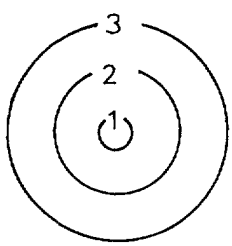
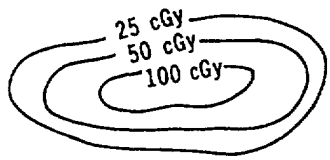
Description	Symbol
The nuclear explosion is represented by a mushroom. The foot of the stem indicates the position of ground zero. Normal colors should be used (BLUE for friendly and RED for enemy). If only one color is available enemy explosions are shown by the use of double lines for the mushroom head.	
If the mushroom is known to be "fallout producing," the stem of the mushroom will be shaded.	
Field locations for the power (KT or MT) and the DTG of the explosion are as shown. When not accurately known (e.g., for enemy bursts), the yield is shown between brackets.	
The height of the explosion is shown in meters on the right side of the mushroom head. If not accurately known, the approximate height should be shown, such as, HIGH, LOW, SURFACE, SUBSURFACE. 	

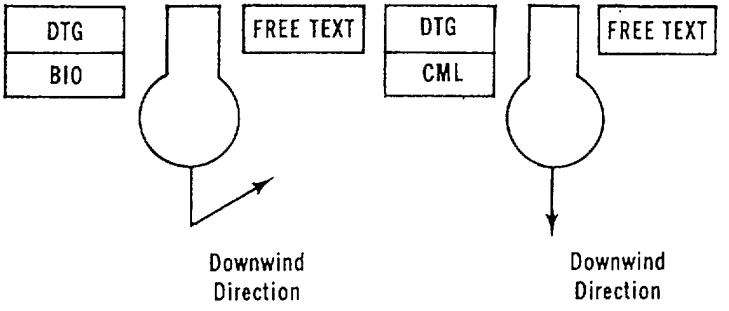
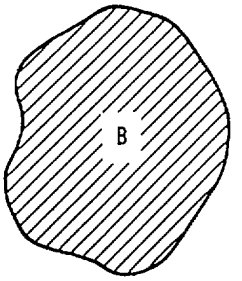
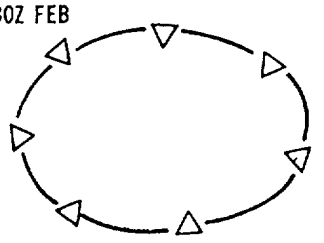
Description	Symbol
The effective downwind direction (if known) will be denoted by an arrow pointing in the appropriate direction from ground zero.	
Proposed explosions may be shown in a similar way by the use of dotted lines.	

As an addition to this basic STANAG 2019 military symbol, friendly atomic demolition munitions (ADM) are shown in green denoting an obstacle. Enemy ADM are shown in green-red or black-green-black. The letters "ADM" are shown on the left side of the mushroom cloud to denote their unique employment. For planned, friendly ADM, the release authority is shown on the top left of the mushroom cloud in lieu of the DTG of the nuclear detonations. When the commander changes the allocation to an authority to expend, the release authority is erased and the DTG inserted. Otherwise, the basic nuclear explosion symbols and meanings are the same as above.

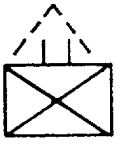
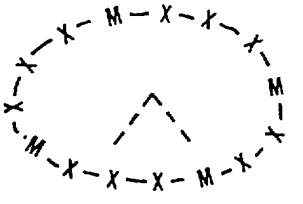


Symbols used for other areas of fire and/or contamination are shown below.

Explanation	Symbol
General symbol to denote indirect fires. The area enclosed by the symbol indicates the approximate area of fire.	 Enemy fire is shown in RED or outlined with a double line; friendly fire is shown in BLUE or black.
Area either screened or to be screened by smoke. 1-66	 Date and time may be added.
Area subjected to high explosive (HE) bombing from the air.	 Other types of fire are similarly shown. For example: air-to-surface missile (ASM) or surface-to-surface missile (SSM).
NBC effects.  1-47	 Shows minimum safe distance (MSD) from ground zero of a nuclear distance explosion as 1, 2, and 3. Levels of radioactivity are represented in centigrays per hour. Rings must be drawn to scale.

Explanation	Symbol
Biological and chemical events.	
Biologically (B) or chemically (C) contaminated areas.	 The symbol is shown in yellow and the letters B or C are written in the center.
Radioactive area. 	220700-1130Z FEB  The intensity expressed in cGy/hr may be shown inside the triangular signs of the iso-intensity curve. The times of the beginning (BF) and end (EF) of radioactive fallout may be shown outside a rectangular box as shown.

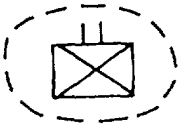
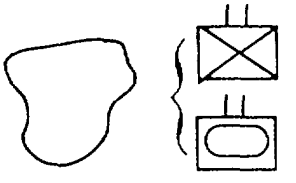
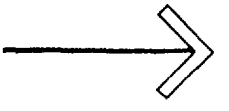
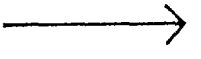
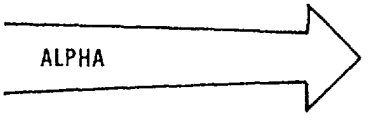
TACTICAL DECEPTION (1-22)

Description	Symbol
General symbol for phony (dummy)	
Phony infantry battalion	
Phony (dummy) minefield, fenced	
Axis of advance for feint	
Direction of attack for feint (1-31)	

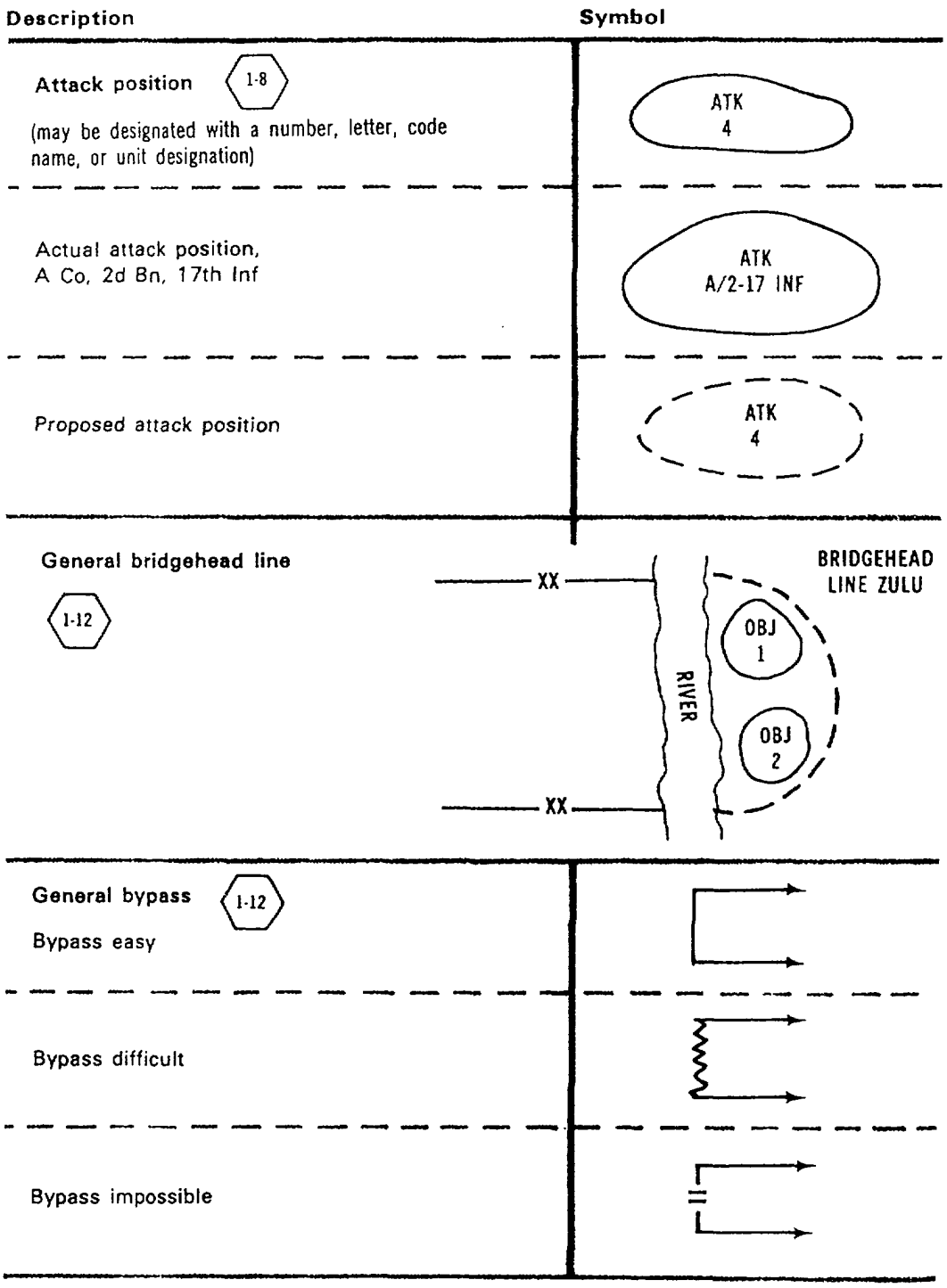
BATTLEFIELD ACTIVITIES

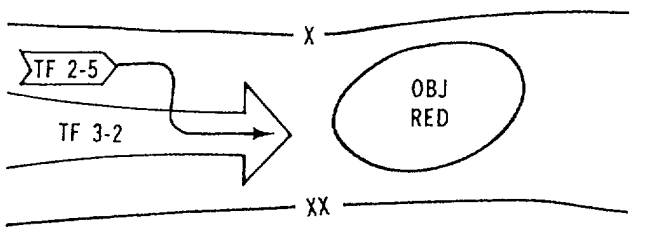
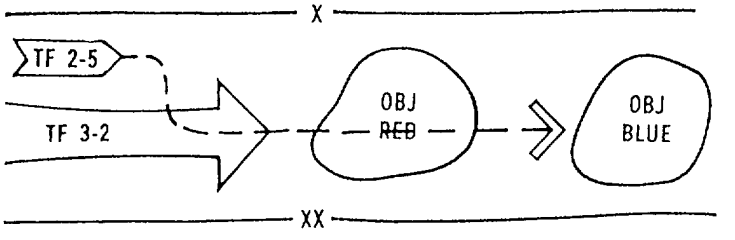
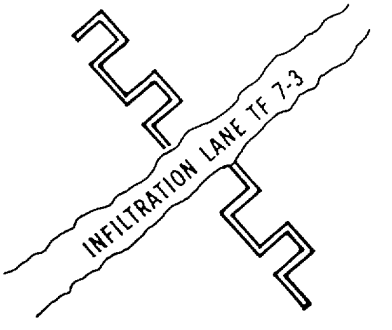
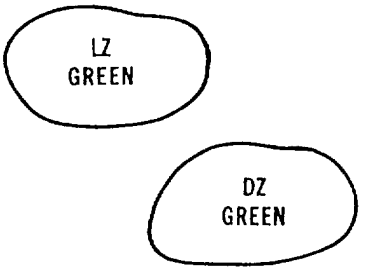
Preceding paragraphs have introduced you to a variety of symbols. These symbols, when standing alone, provide only one piece of information. When these symbols are combined on an operations overlay we get a picture of the battlefield. The following paragraph highlights symbology used by maneuver forces in the offense and defense. Appendixes F, G, and H depict typical situations combining symbols to provide a picture of the battlefield.

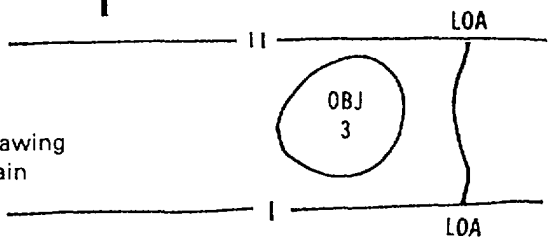
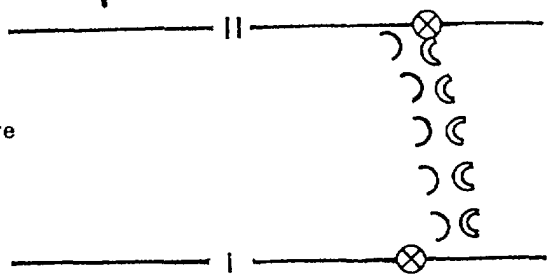
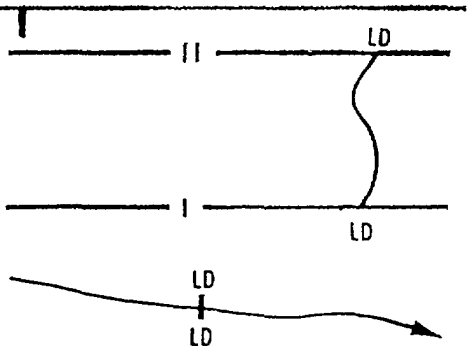
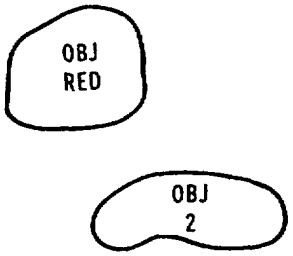
Offense. The placement of symbols in the offense is determined by a grid reference beginning with the start of the movement and ending at an objective or other control measure.

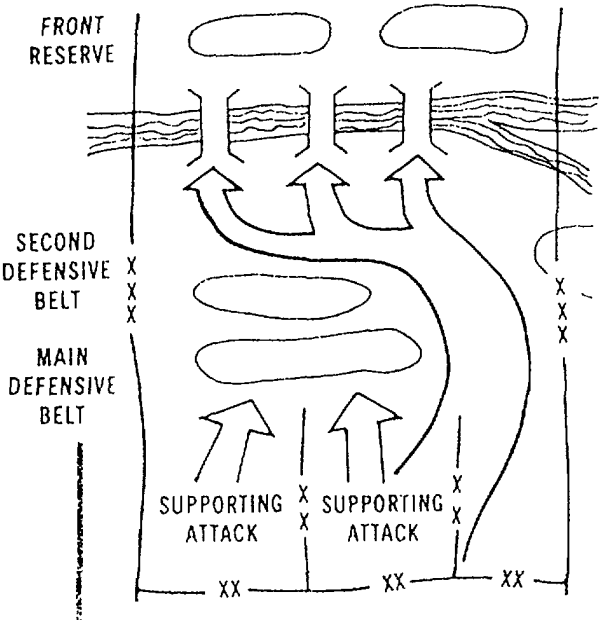
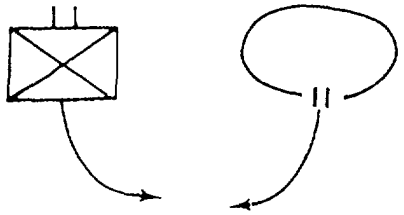
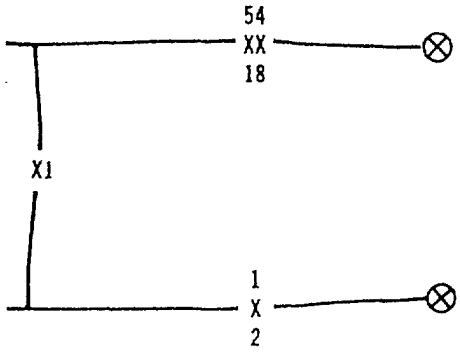
Description	Symbol
Assault position 1-7 Assault positions are enclosed and contain the abbreviation ASLT PSN, with a letter, number, code name, or a unit designation.	
Assembly area 1-7 (may be designated by numbers, letters, code names, or unit designations) Occupied assembly area	
Planned assembly area for a battalion	
Unit symbols displaced to indicate an assembly area for a group of units	
Attack 1-8 Direction of attack Main attack	
Other than main attack	
Axis of advance 1-8	

2-63

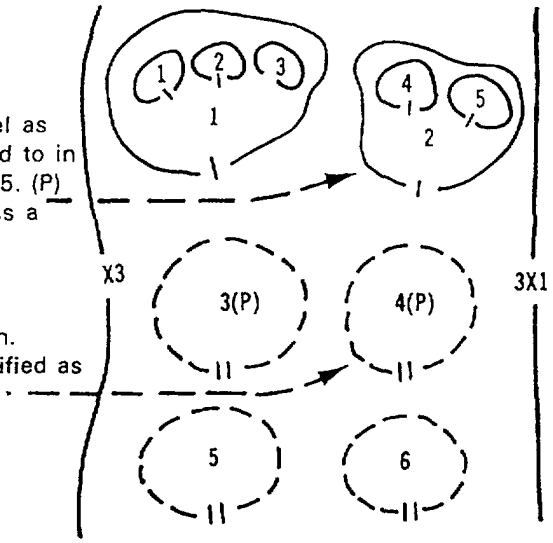
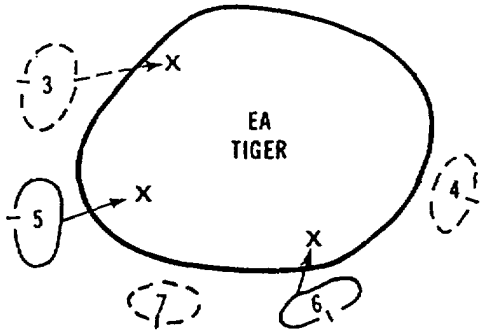
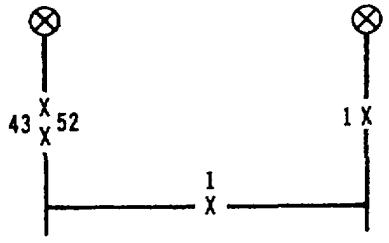

Description
Symbol
Attack position
1-8
(may be designated with a number, letter, code name, or unit designation)
ATK
4
Actual attack position, A Co, 2d Bn, 17th Inf
ATK
A/2-17 INF
Proposed attack position
ATK
4
General bridgehead line
1-12
XX
XX
RIVER
OBJ
1
OBJ
2
BRIDGEHEAD
LINE ZULU
General bypass
1-12
Bypass easy
Bypass difficult
Bypass impossible

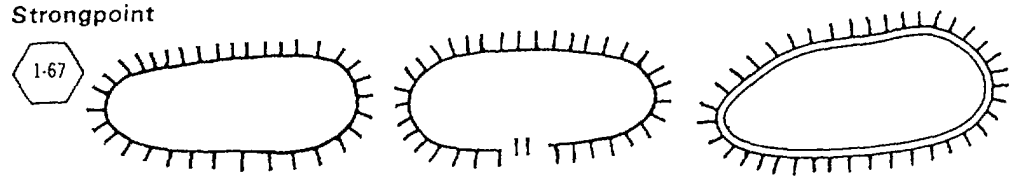
Description	Symbol
Follow and support 1-33 General symbol for follow and support mission	
Follow and assume main attack On order TF 2-5 conducts passage of lines through TF 3-2 and assumes mission of main attack force to seize objective blue	
Infiltration lane 1-38 Movement may be directed on an infiltration lane depicted graphically by two solid lines with the words INFILTRATION LANE and the unit designation	
Landing zone (LZ)/drop zone (DZ) 1-41 1-27 General LZ/DZ symbol	

Description	Symbol
Limit of advance (LOA) 1-42 General LOA symbol is depicted by drawing a line along an easily identifiable terrain feature	
Line of contact (LC) 1-42 General LC symbol. Enemy symbols are depicted with double lines when not portrayed in color	
Line of departure (LD) 1-42 General LD symbol is a solid line generally perpendicular to the direction of attack with the letters LD at either end	
Objective 1-50 General objective symbol is depicted by a line enclosing the abbreviation "OBJ" and a letter, name, or number designation	

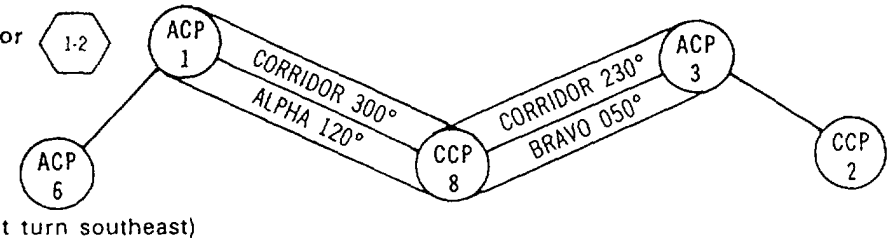
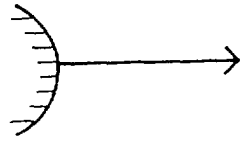
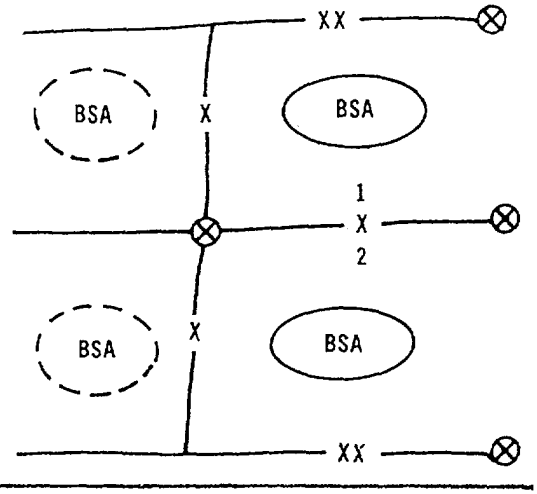
Description	Symbol
Turning movement 1-73 General turning movement symbol	
General symbol for withdrawal (Arrow shows withdrawal route) 1-75	
Zone of action 1-75	

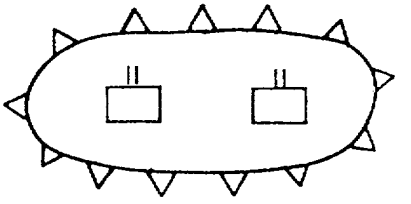
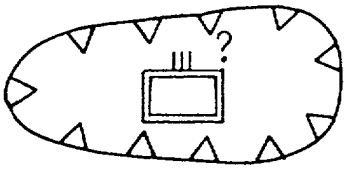
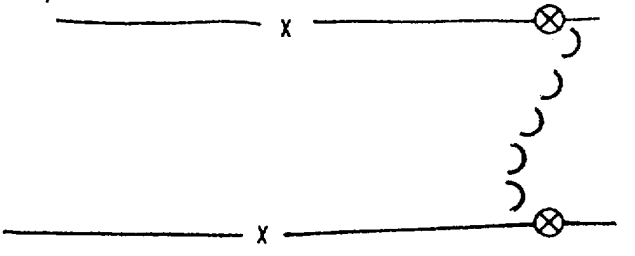
Defense. The placement of symbols in the defense is determined by a grid reference beginning with the forward-most elements and including units near areas such as assembly areas for the reserves or other control measures.

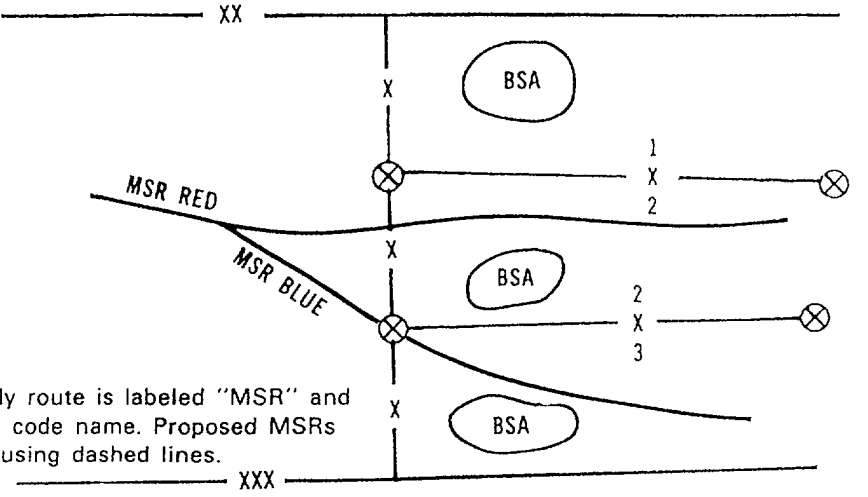
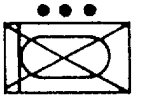
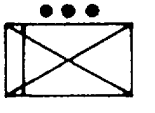
Description	Symbol
Battle position (BP) 1-10 Occupied co BP identified at bn level as BP5. At bde level, this BP is referred to in conjunction with the bn BP as BP2-5. (P) following a position number indicates a prepared position. Prepared bn BP for future occupation. Within the 3d Bde it would be identified as BP4.	
Engagement area 1-29	
Sector 1-64 Sector assigned the 1st Bde, 52d Mech Div	

Description	Symbol
Strongpoint 1-67 (may be combined with unit size symbol)	

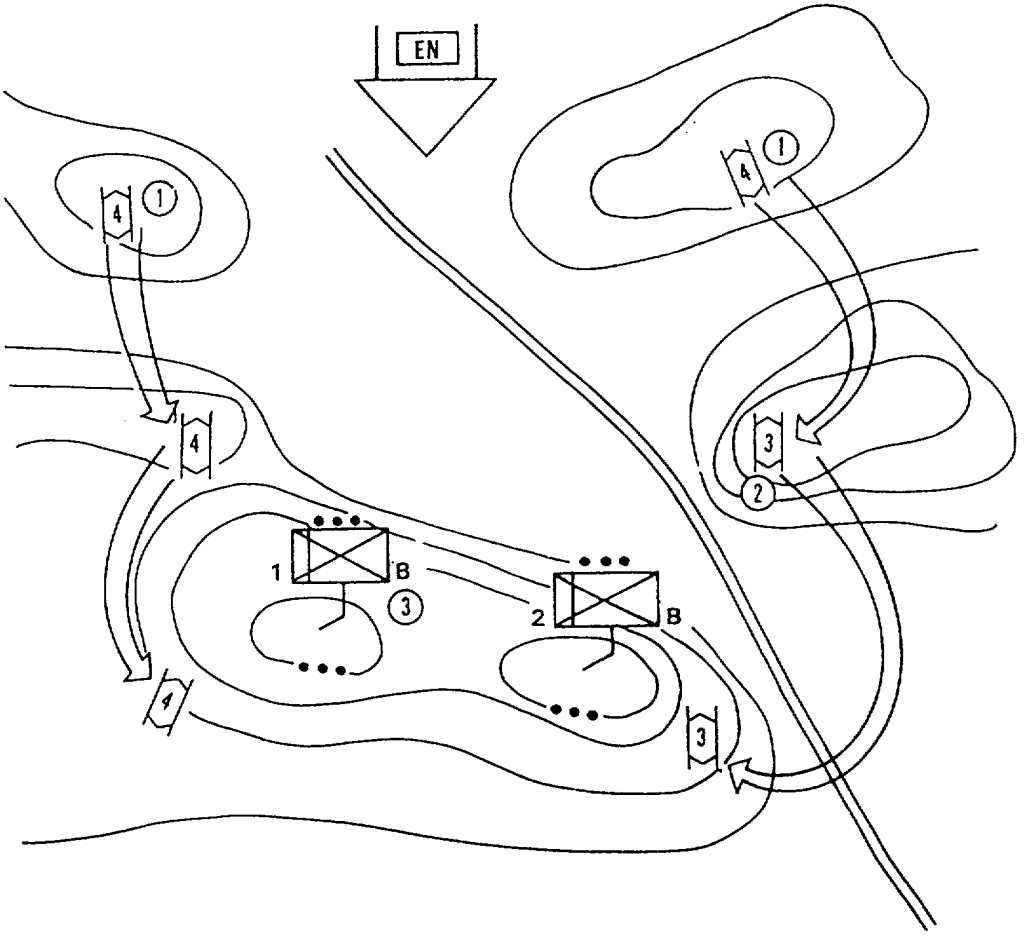
Offense and defense.

Description	Symbol
Air corridor 1-2 (flying east turn southeast)	
Ambush 1-5 Point of arrow at map location	
Brigade support area (BSA) 1-12 Occupied and proposed BSA	

Description	Symbol
Encirclement 1-29	
Friendly forces consisting of two battalions	
Enemy forces believed to be a regiment	
Forward edge of the battle area (FEBA) 1-34	
General FEBA symbol	FEBA ⊗ ⊗ FEBA
Proposed trace of FEBA	FEBA ⊗ - - - - - - ⊗ FEBA
Actual trace of FEBA	FEBA ⊗ ⊗ FEBA
Forward line of own troops (FLOT) 1-34	
General FLOT symbol	

Description	Symbol
Main supply route (MSR) 1-44 A main supply route is labeled "MSR" and is assigned a code name. Proposed MSRs are depicted using dashed lines.	
Phase line (PL) 1-55 Phase lines are labeled "PL" and assigned letters, numbers, or code name designations	
Bradley infantry fighting vehicle (BIFV) BIFV mounted	
BIFV dismounted	

BIFV dismounted
(showing fight positions)



NOTE:

(1) BIFVs fighting forward.

(2) Reflects battle loss.

(3) BIFV squad dismounted.

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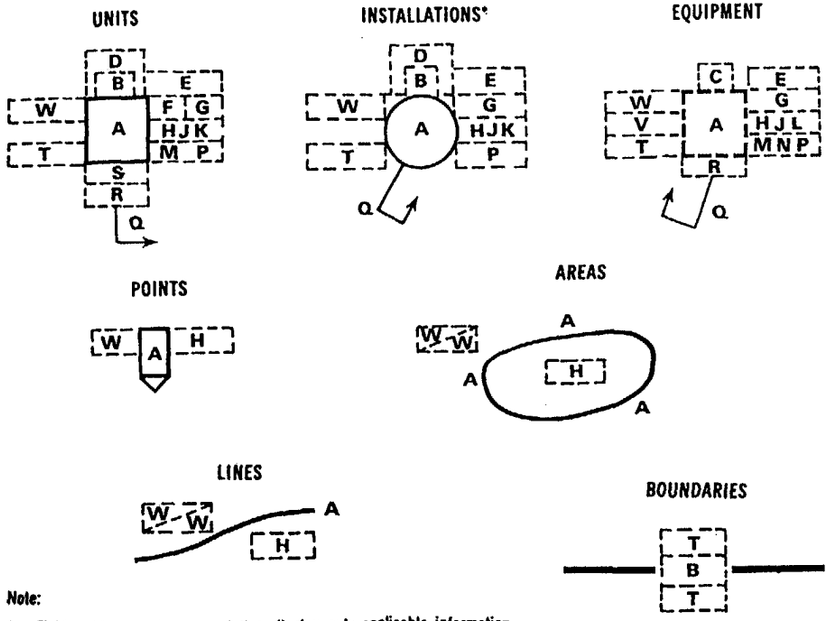
Section IV. LOCATION AND CONTENT OF FIELDS

GENERAL

Each symbol requires a minimum amount of information to be clearly understood. Minimum information is specified by the mandatory fields. Conditional fields display information that modifies the basic symbol and is usually temporary. Optional fields provide additional information that the commander or staff officer wishes to display and they may or may not be used. To avoid confusion, the letters I, O, and U are not used.



Note:

1. Fields with more than one letter, display only applicable information.
2. Red letters indicate enemy use only.

*Also applies to observation posts and electronic installations.

**Field T, Unique Designation, provides the locations for identifying the unit by numbers, letters, names, or abbreviations. Within this field the first designator (the unit's own designation) is placed to the lower left of the square and must agree with the size indicator in field B. (See examples on page 2-85.) Higher echelons of command are then placed in field M, Higher Formation, and are separated by a slash. For those units identified under the Combat Arms Regimental System (CARS), but assigned to a brigade rather than a regiment, both the battalion and traditional regimental numbers are shown, i.e., 1-25, 3-40. To avoid confusion with different levels of command, both numerical designations of the CARS unit are always written together and separated by a hyphen rather than a slash. If there is a break in the chain of command, i.e., the brigade designation is skipped, then the division numeric designation is shown in field M and the size indicator for that echelon of command is placed in field H. (See examples on page 2-74.) When a unit is part of a regiment, such as the 75th Infantry Regiment, the unique designator is placed in field T and the regimental designation is placed in field M. (See example on page 2-75.)

FIELD	FIELD TITLE	DESCRIPTION	APPLICATION	REMARKS
	MANDATORY. A field which must have something in it.			
A	Role Indicator	Basic symbol for units, posts and installations, or equipment.	All	See pp 2-19 through 2-29.
B	Size Indicator	A symbol placed on top of the basic symbol to show the size.	Units and installations	Must be indicated for installations when the number or name of the installation is not unique and unambiguous. A question mark may be used if information is not confirmed when depicting an enemy unit. See pp 2-8 through 2-10.
T	Unique Designation	An alphanumeric title that uniquely identifies a particular symbol.	All (less enemy equipment)	Must agree with size indicator if used. If unknown or unconfirmed, a question mark must be used. May include national distinguishing letter. **CARS
P	Addressing Number	Used for identification when symbol is incomplete or doubtful.	Enemy only units, installations, and equipment	Always shown in parens and consists of three numerics.
	CONDITIONAL. A field which, under certain conditions, must have something in it. When specific conditions are not applicable, it is optional.			
D	Special Size Indicator	Task force or company team (temporary grouping).	Units and installations	See pp 2-8 through 2-10.
F	Reinforced or Detached	Shows whether size indicator is reinforced (+) or reduced (-).	Units	Indicates addition to next subordinate element (+) or detachment of next subordinate element (-). Always shown in parens.
N	Enemy	Indicates enemy by letters "EN".	Enemy equipment	Not required when identified by color or double line.
	OPTIONAL. A field which may be left blank.			
C	Quality of Equipment	Indicates number of items present.	Equipment	Question mark may be included.
E	Unconfirmed	Question mark.	Enemy only	Used when all information is doubtful.
G	Additional Information	Staff comments (example: nicknames).	All	Is not necessarily transmitted to others.
H	Free Text	Additional information not covered by other fields.	All	Question mark permitted with enemy information. Information in this field will be transmitted.
J	Evaluation Rating	One letter and one number.	Enemy only	See STANAG 2022 for ratings (also see FM 34-1 for ratings).
K	Combat Effectiveness	Indicates the effectiveness of the unit or formation displayed.	Units and installations	Displayed as CE followed by a space and two digits or PC followed by a space and two digits. Free text follows separated by a slash. See AR 220-1.
L	Signature Equipment	Indicated by "I" (primarily refers to detectable electronic signatures).	Enemy only equipment	Free text follows separated by a slash.
M	Higher Formation	Number or title of higher echelon of command.	All	Question mark may be included. National distinguishing letters are displayed in parens, if used. Must be shown in order of seniority. **CARS
Q	Direction of Movement Arrow	Represents the direction in which the symbol is moving or will move.	All	Always positioned at the precise location point of the symbol. See p 2-34.
R	Mobility Indicator	Pictorial representation of mobility.	Units and equipment	See p 2-29.
S	Headquarters Representation	Identifies unit symbol as a headquarters.	Units	Question mark may be included. See p 2-4.
V	Type of Equipment	Identifies class or type rather than unique designation.	Equipment	When unconfirmed include question mark.
W	Date-Time Group	Seven-character alphanumeric field for date and time (may be preceded by "AT," "TO," or "FROM").	All	When two fields are indicated, show "FROM" and "TO" or equivalent.

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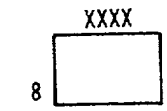
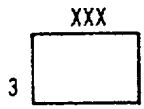
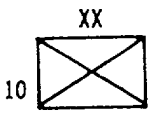
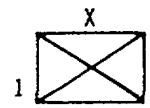
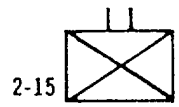
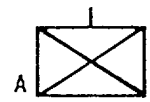
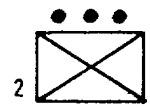
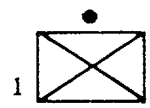
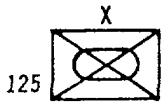
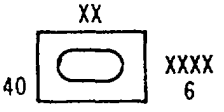
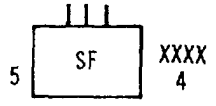
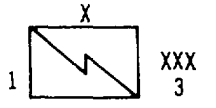
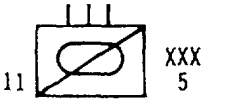
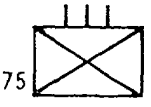
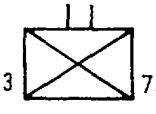
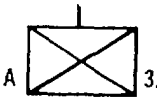
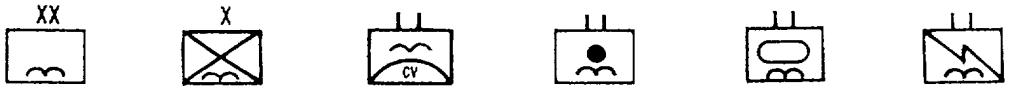
EXAMPLES OF FIELDS

Symbol	Description
	Combat arms regimental system (CARS) Eighth Army
	III Corps
	10th Infantry Division, III Corps, Eighth Army
	1st Brigade, 10th Infantry Division, III Corps
	2d Battalion, 15th Infantry, 1st Brigade, 10th Infantry Division, III Corps
	A Company, 2d Battalion, 15th Infantry, 1st Brigade, 10th Infantry Division
	2d Platoon, A Company, 2d Battalion, 15th Infantry, 10th Infantry Division
	1st Squad, 2d Platoon, A Company, 2d Battalion, 15th Infantry
	125th Infantry Brigade (Mech), III (US) Corps

Symbol	Description
	40th Armored Division, Sixth Army
	5th Special Forces Group, Fourth Army
	1st Signal Brigade, III Corps
	11th Armored Cavalry Regiment, V Corps
	Regimental 75th Infantry Regiment
	3d Battalion, 75th Infantry Regiment
	A Company, 3d Battalion, 75th Infantry Regiment
	2d Platoon, A Company, 3d Battalion, 75th Infantry Regiment
	4th Squad, 2d Platoon, A Company, 3d Battalion, 75th Infantry Regiment

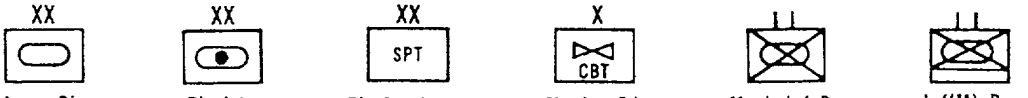
EXAMPLES OF SYMBOLS BY ROLE INDICATORS WITHIN A TYPE DIVISION

Airborne Division

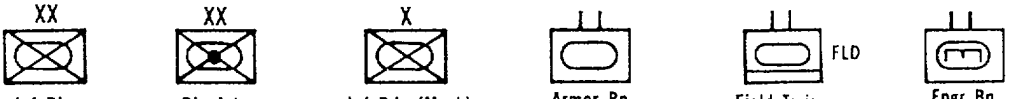


Air Assault Division

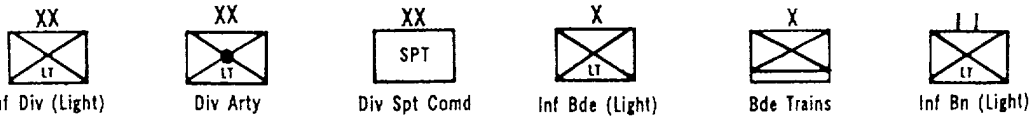
Armor Division



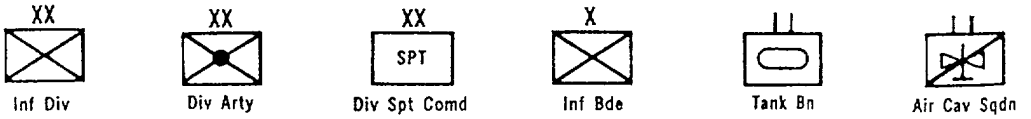
Mechanized Division



Infantry Division (Light)



Infantry Division




Abn Med Bn

Abn MI Bn


Air Cav Sqdn

Cbt Avn Bn


Abn Antiarmor Co


Abn Cml Co

ADA Bn AASLT


Air Cav Sqdn AASLT

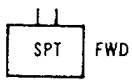

Sig Bn AASLT

MI Bn AASLT


Med Bn AASLT

MP Co AASLT


Sig Bn



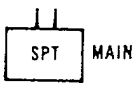
Fwd Spt Bn


Atk Hel Co


Bridge Co
Engr Bn


ADA Btry
Armd Div CHAP


MLRS Btry



Main Spt Bn
Mech Div


Cav Sqdn
Mech Div


Inf Co
Mech Div


Trans Acft
Maint Co

Tgt Acq Btry

Gen Spt Avn Co


Recon Bn
(Light) Inf Div

ADA Bn

Engr Bn


Maint Bn


Trans Bn


Sig Bn

Avn Bn

ADA Bn

Engr Bn

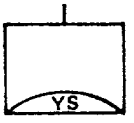

Sig Bn

MI Bn

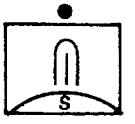

Cml Co

EXAMPLES OF SYMBOLS BY BRANCH

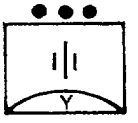
Air Defense Artillery



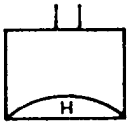
SGT YORK/STINGER



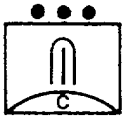
STINGER Crew



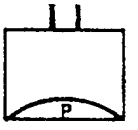
SGT YORK Platoon



HAWK Battalion

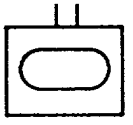


CHAPARRAL Platoon

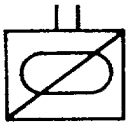


PATRIOT Battalion

Armor

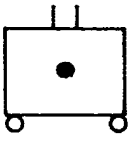


Armored Battalion

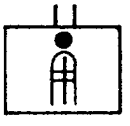


Armored Cavalry

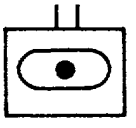
Field Artillery



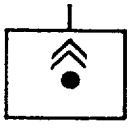
Field Artillery Battalion with towed HOWITZER



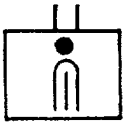
Field Artillery Battalion PERSHING



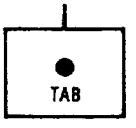
Field Artillery Battalion with self-propelled HOWITZER



Multiple Launched Rocket System Battery

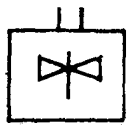


Field Artillery Battalion LANCE

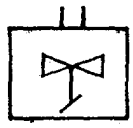


Field Artillery Target Acquisition Battery

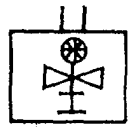
Aviation



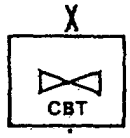
Aviation Battalion
fixed wing



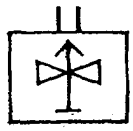
Reconnaissance
Battalion



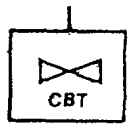
Medium Lift Helicopter
Battalion



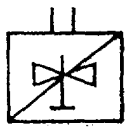
Combat Aviation Brigade



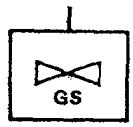
Attack Helicopter



Combat Aviation
Company

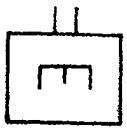


Air Cavalry Squadron

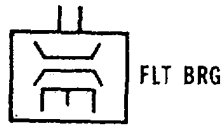


General Support Aviation Company

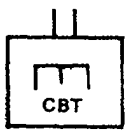
Engineer



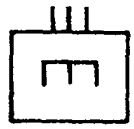
Engineer Battalion
General Construction



Engineer Float Bridge
Battalion



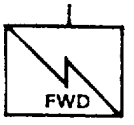
Combat Engineer Battalion



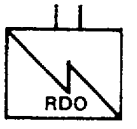
Engineer Group

Engineer Bridge
Company AVLB

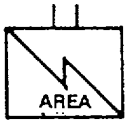
Signal



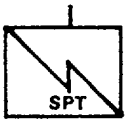
Forward Communications Company



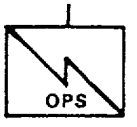
Radio Battalion



Area Signal Battalion

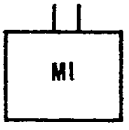


Signal Support Operations Company

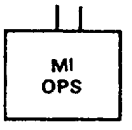


Command Operations Company

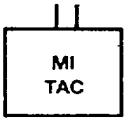
Military Intelligence



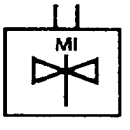
Military Intelligence Battalion



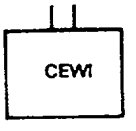
Military Intelligence Operations Battalion



Military Intelligence Battalion, Tactical Exploitation

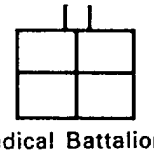


Military Intelligence Battalion, Aerial Exploitation

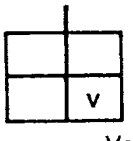


Divisional Military Intelligence Battalion

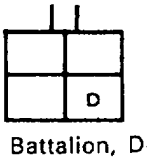
Medical



Medical Battalion

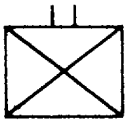


Medical Company, Veterinarian

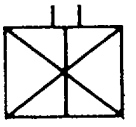


Medical Battalion, Dental

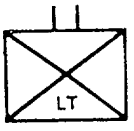
Infantry



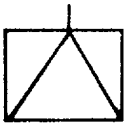
Infantry Battalion



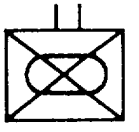
Infantry Battalion (Motorized)



Infantry Battalion (Light)

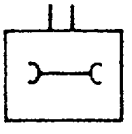


Antiarmor Company

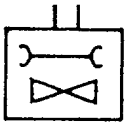


Infantry Battalion (Mechanized)

Maintenance

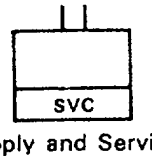


Maintenance Battalion

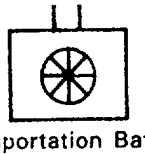


Aviation Maintenance Battalion

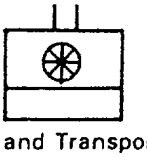
Transportation



Supply and Services Battalion

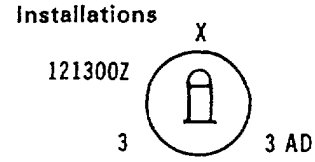
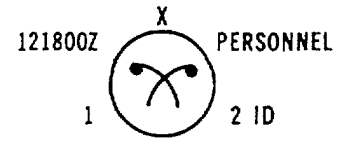
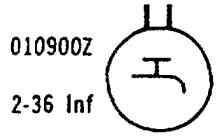
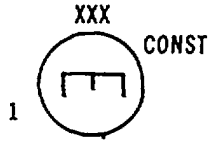
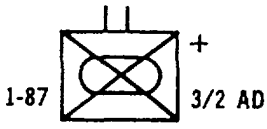
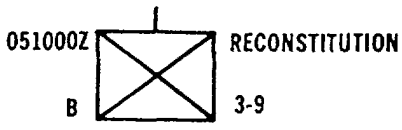


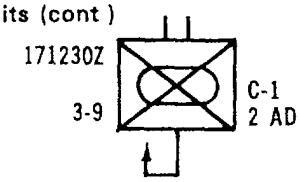
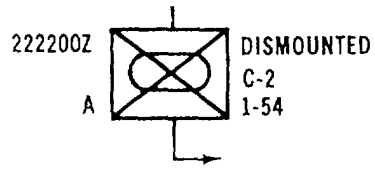
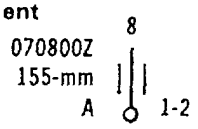
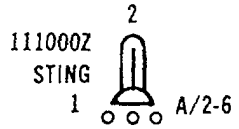
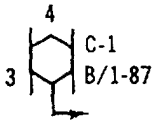
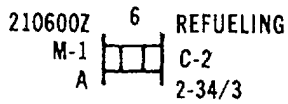
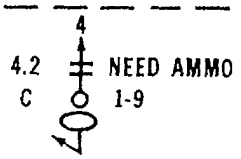
Transportation Battalion

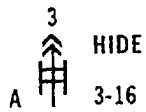
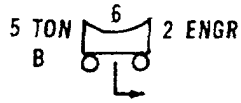
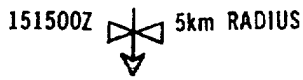


Supply and Transportation Battalion

EXAMPLES OF SYMBOLS WITH FIELD INFORMATION ADDED

Symbol	Description
Installations 	Ammunition Supply Point of the 3d Bde, 3d Armd Div, open as of 1300Z the 12th
	Personnel Decontamination Point of the 1st Bde, 2d Inf Div, open as of 1800Z the 12th
	Aviation Fuel Supply for the 1st Inf Div
	Water Point of the 2-36th Inf open as of 0900Z the 1st
	1st Corps Engineer Construction Supply Point
Units 	1st Bn, 87th Inf (Reinforced) of the 3d Bde, 2d Armd Div
	B Co, 3d Bn, 9th Inf, being reconstituted as of 1000Z the 5th

Symbol	Description
Units (cont) 	3d Bn, 9th Inf of the 2d Armd Div, rated C-1, moving north as of 1230Z the 17th
	A Co, 1st Bn (Mech), 54th Inf, Dismounted, rated C-2, moving east as of 2200Z the 22d (APC equipped)
Equipment 	Eight 155-mm Howitzers of A Btry, 1st Bn, 2d FA, valid as of 0800Z the 7th
	Two STINGER missiles from 1st Plt, A Btry, 2d Bn, 6th ADA, with cross-country mobility. Location valid as of 1000Z the 11th.
	Four BIFV of the 3d Plt, B CO, 1st Bn, 87th Inf, rated C-1 and moving east
	Six M-1 Tanks from A Co, 2-34 Armd, 3d Bde, refueling as of 0600Z the 21st, rated C-2
	Four 4.2-in Mortars from C Co, 1st Bn, 9th Inf, moving NW and requiring ammo resupply

Symbol	Description
	Three MLRS from A Btry, 3d Bn, 16th FA, in hide position
	Six 5-ton Trucks from B Co, 2d Engr, moving east
	An RPV flying within a 5km radius as of 1500Z the 15th
	An Enemy Heavy Antitank Gun

APPENDIX B

Branch Symbols Unique to Certain of the Allies

(STANAG 2019)

Service, arm, branch, and duty performed symbols peculiar to certain NATO nations are shown below.

Description	Nations	Symbol	Meaning of Symbol	Remarks
Ordnance	UK, CA		*Shield and crossed weapons*	
Gendarmerie	BE			Abbreviation is symbol
Gendarmerie	FR		*Bomb with flare*	
Headquarters units	GE, FR			
Mixed	GE			
Heavy	GE			
Medium	GE			
Traffic regulation	UK			Abbreviation is symbol
Train	GE			

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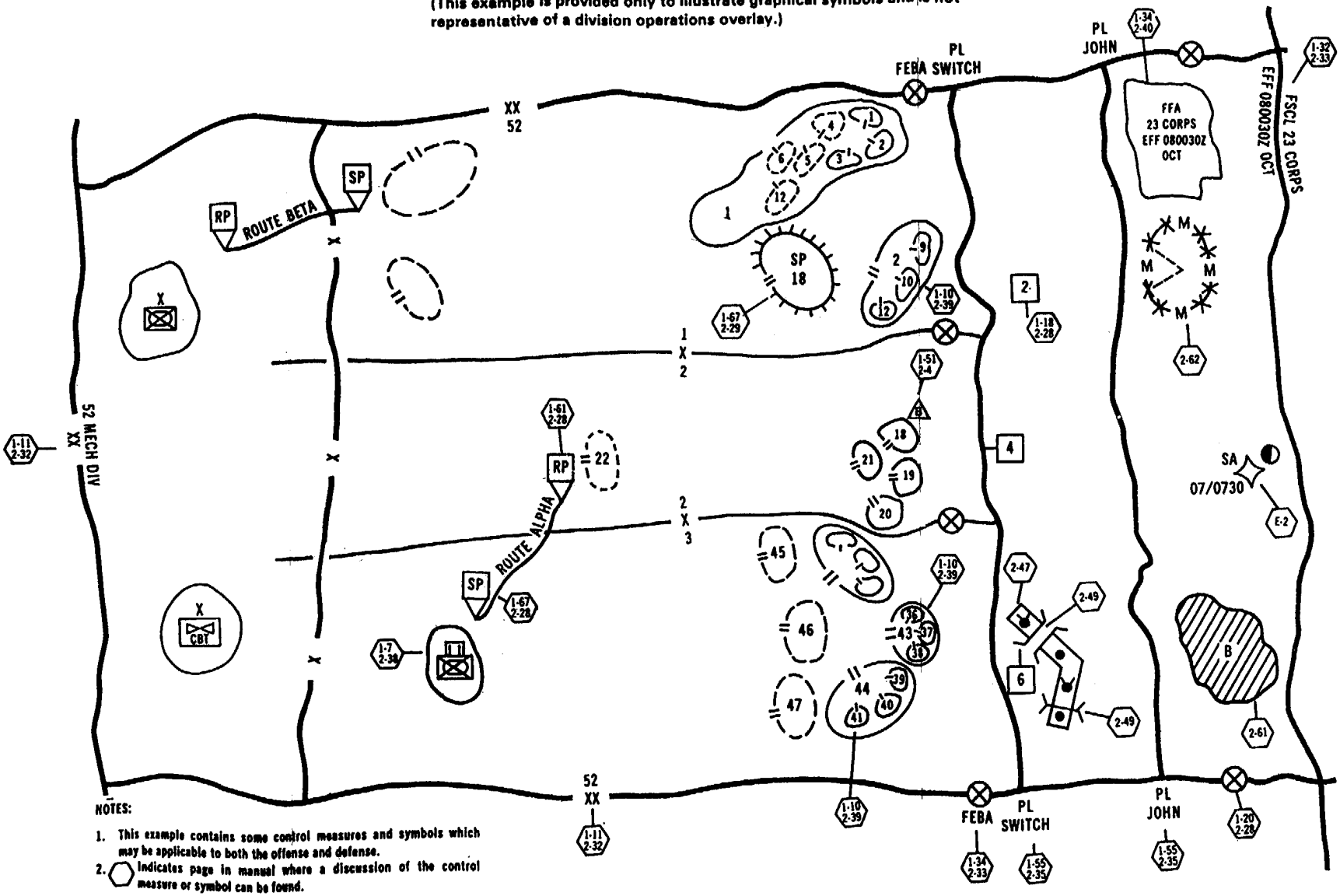
Control Measures Commonly Employed in the Defense

(This example is provided only to illustrate graphical symbols and is not representative of a division operations overlay.)



NOTES:

1. This example contains some control measures and symbols which may be applicable to both the offense and defense.
2. ⬡ indicates page in manual where a discussion of the control measure or symbol can be found.

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