MCI 0332G

MARINE CORPS INSTITUTE

RECONNAISSANCE MARINE

MARINE BARRACKS
WASHINGTON, DC

UNITED STATES MARINE CORPS
MARINE CORPS INSTITUTE
WASHINGTON NAVY YARD
912 POOR STREET SE
WASHINGTON, DC 20391-5680

03.32g
05 May 98

MCI 03.32g RECONNAISSANCE MARINE

1. Purpose. MCI course 03.32g, Reconnaissance Marine, has been published as a part of the Marine Corps' continuing education program to provide instruction to all Marines.

2. Scope. This course is designed to provide basic knowledge on the organization of the reconnaissance units, photography, field sketching, reconnaissance reports, and initial terminal guidance. Finally, the course covers the amphibious and lines of communication missions.

3. Applicability. This course is intended for instructional purposes only. It is designed for use by Marines in the ranks of Pvt - Sgt with an interest in learning about reconnaissance units.

4. Recommendations. Comments and recommendations on the contents of the course are invited and will aid in subsequent course revisions. Please complete the course evaluation questionnaire located at the end of the text and return it to:

Director (DLTP Support Team)
Marine Corps Institute
Washington Navy Yard
912 Poor Street SE
Washington, DC 20391-5680

G. WHITE
Lieutenant Colonel, U.S. Marine Corps
Deputy Director

ERRATUM CHANGE PAGE TO COURSE MATERIAL

1. Purpose. The purpose of this change is to give the student current instructions regarding the instructions for the Review Lesson Examination page.

2. Action. Change the instructions found on page R-1 of this book to read as follows:

"The purpose of the review lesson examination is to prepare you for your final examination. We recommend that you try to complete your review lesson examination without referring to the text, but for those items (questions) you are unsure of, restudy the text. When you finish your review lesson and are satisfied with your responses, check your responses against the answers provided at the end of this review lesson examination.

Select the ONE answer that BEST completes the statement or that answers the item. For multiple choice items, circle your response. For matching items, place the letter of your response in the space provided."

3. This page is to be filed directly behind the Promulgation Letter of this course.

RECONNAISSANCE MARINE

CONTENTS

CONTENTS--cont'd

Student Information

Number and Title	MCI 0332G RECONNAISSANCE MARINE
Study Hours	16
Course Materials	Text
Review Agency	Amphibious Reconnaissance Course Landing Force Training Command Atlantic Naval Surface Force U.S. Atlantic Fleet Little Creek, Virginia 23521
Reserve Retirement Credits (RRC)	5
ACE	Not applicable to civilian training/education
Assistance	For administrative assistance, have your training officer or NCO log on to the MCI home page at www.mci.usmc.mil. Marines CONUS may call toll free 1-800-MCI-USMC. Marines worldwide may call commercial (202) 685-7596 or DSN 325-7596.

Study Guide

Congratulations

Congratulations on your enrollment in a distance education course from the Distance Learning and Technologies Department (DLTD) of the Marine Corps Institute (MCI). Since 1920, the Marine Corps Institute has been helping tens of thousands of hard-charging Marines, like you, improve their technical job performance skills through distance learning. By enrolling in this course, you have shown a desire to improve the skills you have and master new skills to enhance your job performance. The distance learning course you have chosen, MCI 0332G, *Reconnaissance Marine,* is designed to provide basic knowledge on the organization of the reconnaissance units, photography, field sketching, reconnaissance reports, and initial terminal guidance. Finally, the course covers the amphibious and lines of commuication missions.

Your Personal Characteristics

- **YOU ARE PROPERLY MOTIVATED.** You have made a positive decision to get training on your own. Self-motivation is perhaps the most important force in learning or achieving anything. Doing whatever is necessary to learn is motivation. You have it!

- **YOU SEEK TO IMPROVE YOURSELF.** You are enrolled to improve those skills you already possess, and to learn new skills. When you improve yourself, you improve the Corps!

- **YOU HAVE THE INITIATIVE TO ACT.** By acting on your own, you have shown you are a self-starter, willing to reach out for opportunities to learn and grow.

- **YOU ACCEPT CHALLENGES.** You have self-confidence and believe in your ability to acquire knowledge and skills. You have the self-confidence to set goals and the ability to achieve them, enabling you to meet every challenge.

- **YOU ARE ABLE TO SET AND ACCOMPLISH PRACTICAL GOALS.** You are willing to commit time, effort, and the resources necessary to set and accomplish your goals. These professional traits will help you successfully complete this distance learning course.

Continued on next page

Beginning Your Course

Before you actually begin this course of study, read the student information page. If you find any course materials missing, notify your training officer or training NCO. If you have all the required materials, you are ready to begin.

To begin your course of study, familiarize yourself with the structure of the course text. One way to do this is to read the table of contents. Notice the table of contents covers specific areas of study and the order in which they are presented. You will find the text divided into several study units. Each study unit is comprised of two or more lessons, lesson exercises, and finally, a study unit exercise.

Leafing Through the Text

Leaf through the text and look at the course. Read a few lesson exercise questions to get an idea of the type of material in the course. If the course has additional study aids, such as a handbook or plotting board, familiarize yourself with them.

The First Study Unit

Turn to the first page of study unit 1. On this page, you will find an introduction to the study unit and generally the first study unit lesson. Study unit lessons contain learning objectives, lesson text, and exercises.

Reading the Learning Objectives

Learning objectives describe in concise terms what the successful learner, you, will be able to do as a result of mastering the content of the lesson text. Read the objectives for each lesson and then read the lesson text. As you read the lesson text, make notes on the points you feel are important.

Completing the Exercises

To determine your mastery of the learning objectives and text, complete the exercises developed for you. Exercises are located at the end of each lesson, and at the end of each study unit. Without referring to the text, complete the exercise questions and then check your responses against those provided.

Continued on next page

Continuing to March

Continue on to the next lesson, repeating the above process until you have completed all lessons in the study unit. Follow the same procedures for each study unit in the course.

Preparing for the Final Exam

To prepare for your final exam, you must review what you learned in the course. The following suggestions will help make the review interesting and challenging.

- **CHALLENGE YOURSELF.** Try to recall the entire learning sequence without referring to the text. Can you do it? Now look back at the text to see if you have left anything out. This review should be interesting. Undoubtedly, you'll find you were not able to recall everything. But with a little effort, you'll be able to recall a great deal of the information.

- **USE UNUSED MINUTES.** Use your spare moments to review. Read your notes or a part of a study unit, rework exercise items, review again; you can do many of these things during the unused minutes of every day.

- **APPLY WHAT YOU HAVE LEARNED.** It is always best to use the skill or knowledge you've learned as soon as possible. If it isn't possible to actually use the skill or knowledge, at least try to imagine a situation in which you would apply this learning. For example make up and solve your own problems. Or, better still, make up and solve problems that use most of the elements of a study unit.

- **USE THE "SHAKEDOWN CRUISE" TECHNIQUE.** Ask another Marine to lend a hand by asking you questions about the course. Choose a particular study unit and let your buddy "fire away." This technique can be interesting and challenging for both of you!

- **MAKE REVIEWS FUN AND BENEFICIAL.** Reviews are good habits that enhance learning. They don't have to be long and tedious. In fact, some learners find short reviews conducted more often prove more beneficial.

Continued on next page

Tackling the Final Exam

When you have completed your study of the course material and are confident with the results attained on your study unit exercises, take the sealed envelope marked **"FINAL EXAM"** to your unit training NCO or training officer. Your training NCO or officer will administer the final examination and return the examination and the answer sheet to MCI for grading. Before taking your final examination, read the directions on the DP-37 answer sheet carefully.

Completing Your Course

The sooner you complete your course, the sooner you can better yourself by applying what you've learned! HOWEVER--you do have 2 years from the date of enrollment to complete this course.

Graduating!

As a graduate of this distance education course and as a dedicated Marine, your job performance skills will improve, benefiting you, your unit, and the Marine Corps.

Semper Fidelis!

STUDY UNIT 1

MARINE RECONNAISSANCE UNITS

Introduction. During 1968, about 1,600 reconnaissance patrols were conducted in the 3d Marine Division area of operation in Vietnam. The operational tempo averaged approximately 120 to 130 patrols a month. One of every three patrols made direct contact with an enemy force. Rarely did a patrol go out on an uneventful mission. Therefore, as a reconnaissance Marine, you must be physically and mentally prepared to deal with the unexpected. Your mission will include the task of obtaining information about the activities and resources of an enemy or potential enemy by visual observation or other detection methods.

Reconnaissance teams are also assigned the job of securing data concerning the meteorological, hydrographic, or geographic characteristics of a particular area when the data cannot be obtained or verified by any other means. This information is used to produce intelligence. Reconnaissance operations vary with the operational environment, the assigned mission, and the size, type, and composition of the reconnaissance element.

During this study unit we will cover the mission, organization, and training of force and battalion reconnaissance units.

Lesson 1. RECONNAISSANCE UNITS

LEARNING OBJECTIVES

1. Identify the primary mission of the force reconnaissance company.

2. Identify the organization of the force reconnaissance company.

3. Identify the primary mission of the reconnaissance battalion.

4. Identify the organization of the reconnaissance battalion.

1101. Force Reconnaissance Company

As a reconnaissance Marine there are many tasks and skills which must be learned and practiced over and over. The experiences of working with team members you trust with your life and training to the point of total exhaustion give you feelings of pride and accomplishment which are difficult to match.

a. Mission. The mission of the force reconnaissance company varies. Some of its tasks are very clandestine and cannot be explained in detail. The primary mission of the force reconnaissance company is to conduct preassault and deep postassault reconnaissance in support of the landing force. Specific conventional and special operations conducted in support of the Marine Air Ground Task Force (MAGTF) are listed below.

(1) Advance force operations

(2) Reconnaissance and surveillance in support of subsequent joint operations

(3) Limited scale raids by direct action platoons

(a) Assault surface platforms

(b) Capture selected personnel

(c) Interdict selected targets

(d) Conduct destruction raids

(4) Engage enemy with supporting arms

(5) Conduct initial terminal guidance

(6) Implant sensors

(7) Conduct other special operations as directed

b. Employment. The force reconnaissance company and its elements may be employed to collect significant military information, provide initial terminal guidance, and perform special operations designated by the force commander. The company has no offensive capability and is not employed as a tactical unit; nor is it assigned tactical missions, tactical objectives, or tactical areas of responsibility. The company accomplishes its assigned mission by furnishing small scout teams and supporting personnel to perform specific reconnaissance, surveillance, and guidance tasks.

c. Organization. The company is organized to provide the landing force commander with individual teams and necessary support personnel to execute specific missions. The company is composed of 12 platoons: a headquarters platoon, a supply and service platoon, 5 force reconnaissance platoons and 5 direct action platoons. All members of the reconnaissance platoons are trained as surface swimmers, inflatable boat handlers, and parachutists. A limited number are trained as underwater swimmers (SCUBA). Figure 1-1 shows an organizational chart of the force reconnaissance company.

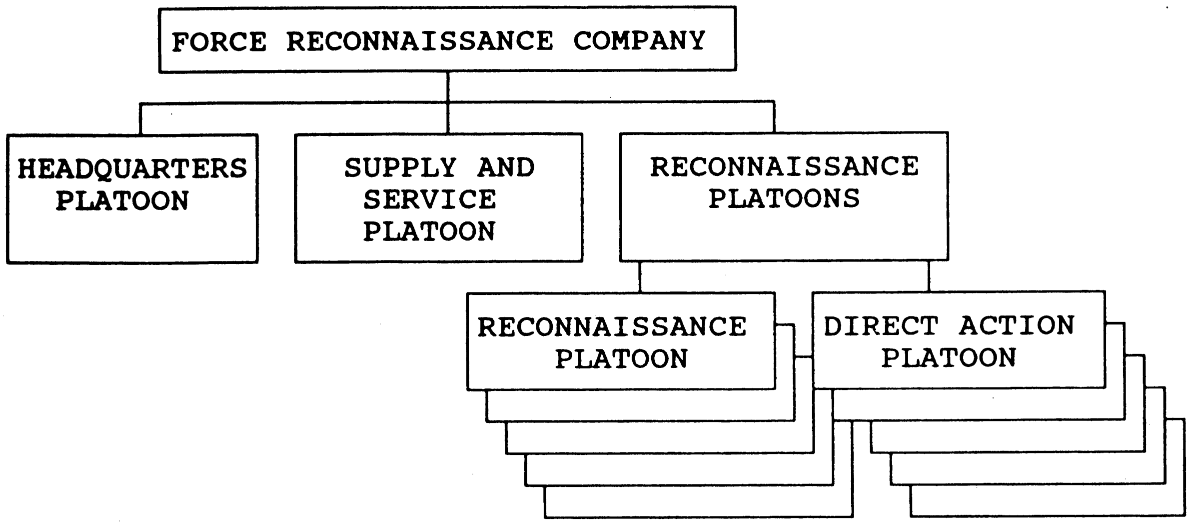


Fig 1-1. Force reconnaissance company.

(1) Headquarters platoon. The headquarters platoon contains a headquarters section, an operations section, and a communications section. The operations section contains both an operations officer and an intelligence officer with appropriate enlisted assistants. Although the company is concerned primarily with the collection and reporting of raw information for processing into intelligence by the receiving headquarters, the organic intelligence personnel are capable of limited intelligence production to serve the needs of the company commander.

(2) Supply and service platoon. The supply and service platoon is organized to provide limited logistical support to the company in garrison and in rear areas in the field. The platoon consists of platoon headquarters, a supply section, a mess section, and an amphibious equipment maintenance section referred to as the SCUBA locker.

(3) Reconnaissance platoons. There are 10 reconnaissance platoons broken into 2 groups. Five platoons consists of two six-man teams and the other five (direct action) platoons consist of three six-man teams. Normally each team acts independently of all the other teams while conducting a specific mission. Patrols are briefed and inserted into their operational areas by various means and methods, and recovered separately. The tasks of the direct action platoons consist of small scale operations such as limited raids and the rescue of non-combatants.

1102. Reconnaissance Battalion

There is a very basic mission difference between the two reconnaissance units. The force reconnaissance unit performs its mission farther behind enemy lines and is employed by the Marine Expeditionary Force. Battalion reconnaissance performs its mission closer to friendly lines and is employed by the division.

a. Mission. The primary mission of the reconnaissance battalion is to conduct ground reconnaissance and observation in support of the Marine division and its elements. Specific tasks performed by the reconnaissance battalion are listed below.

(1) Conduct pre-H-hour reconnaissance.

(2) Engage the enemy with supporting arms as directed or authorized by the division commander.

(3) Implant and monitor sensors.

(4) Capture selected prisoners.

(5) Conduct specialized terrain reconnaissance including beach, road/route, and HLZ/DZ reconnaissance missions.

(6) Conduct initial terminal guidance.

(7) Perform special missions.

When force reconnaissance is unable to perform its mission, battalion reconnaissance has the ability to perform that task.

b. Employment. The reconnaissance battalion and its elements gain intelligence information in support of the Marine division or subordinate task organizations. The reconnaissance battalion is not equipped for decisive or sustained combat. It must accomplish its mission through stealth, maneuver, and accurate and rapid reporting. The battalion is dependent upon extensive use of helicopters and light motor vehicles to provide mobility.

c. Organization. The reconnaissance battalion is an organic unit of the Marine division and is composed of a headquarters and service company and four reconnaissance companies. Figure 1-2 on the following page shows the organizational chart of the reconnaissance battalion. Each reconnaissance company includes a headquarters section and three platoons consisting of surface swimmers and as many inflatable boat handlers as necessary. A limited number are trained as underwater swimmers and parachutists.

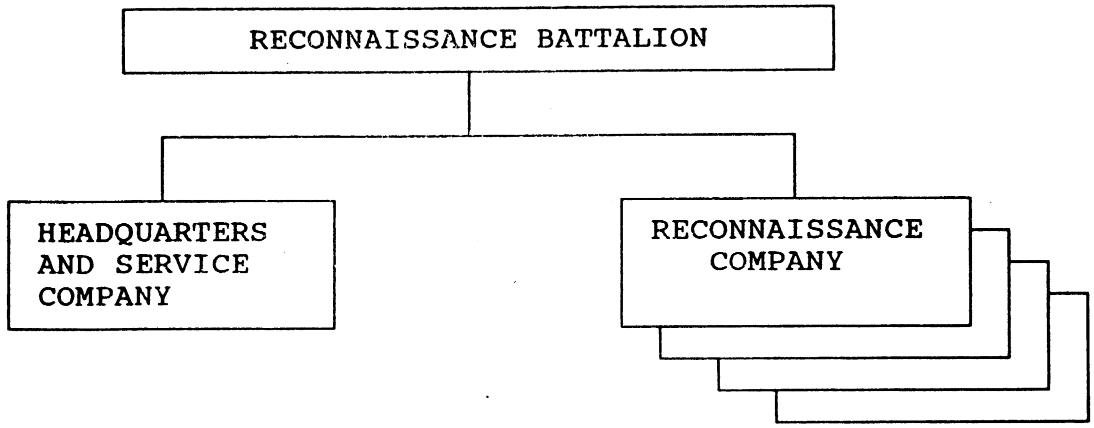


Fig 1-2. Reconnaissance battalion organization.

(1) Headquarters and service company. The headquarters and service company consists of a battalion headquarters, a communications platoon, a service platoon, and company headquarters. Its mission is to provide the reconnaissance battalion commander with the facilities for effective command and control.

(2) Reconnaissance company. The reconnaissance company is a lightly armed, highly mobile, and specially trained unit designed to obtain intelligence information through reconnaissance. It consists of a company headquarter and three reconnaissance platoons. Each platoon contains a headquarters and two reconnaissance squads. The reconnaissance squads are further subdivided into two four-man scout teams. One of the platoons in each company has a four-man team qualified in underwater swimming, providing the company limited underwater capability.

Now that we have gone over the organization and mission of the reconnaissance units, what is the primary mission of the force reconnaissance company?

____

____

If you said to conduct preassault and deep postassault reconnaissance in support of the landing force, you are correct.

Lesson Summary. This lesson covered the organization and mission of the reconnaissance units. You may discover slight variations in unit organization in the Marine Corps due to the fast pace of changes, a variety of differing SOPs among units, and the constantly changing tasks necessary for performing a variety of missions.

Lesson 2. RECONNAISSANCE TRAINING

LEARNING OBJECTIVES

1. Identify the four progressive phases of reconnaissance training.

2. Identify the organization which selects reconnaissance personnel.

1201. Training Concepts

a. Objective. The sole objective of reconnaissance training is successful execution of the reconnaissance combat mission. Successful employment of preassault and postassault ground reconnaissance requires that training programs develop reconnaissance teams which are capable of conducting undetected activities on enemy ground under conditions of limited support from sources outside the teams. Such undetected activities include entry into a reconnaissance area of operation (RAO), patrol movement within the operating area, execution of information collection and terminal guidance tasks, submission of patrol reports from within the operating areas, debriefing, and submission of final reports. These training concepts are accomplished by stressing team integrity, balance, and realism throughout all phases of reconnaissance training.

b. Prior training experience. Ideally, the reconnaissance training cycle should span a minimum of one year to properly train personnel in the required skills and techniques. Most personnel assigned to a reconnaissance unit should have completed at least one year of service in a Marine division. In addition, a majority of the noncommissioned officers should have completed one or more tours with reconnaissance units.

c. Training phases. Reconnaissance training progresses through four phases: basic individual training, advanced individual training, basic unit training, and advanced unit training. More specific information about these training phases are discussed below and on the following page.

(1) Phase one: Basic individual training. Basic individual training provides the Marine with information in several areas.

(a) Preparatory parachute training. Prior to assignment to Army airborne courses, Marines should complete a concentrated parachute training course conducted by the reconnaissance unit. Completion of such a preparatory course ensures that the Marine will have no difficulty passing the actual airborne school.

(b) Demolitions. Although reconnaissance units do not perform tasks requiring extensive use of demolitions, sometimes it may be necessary for them to carry out demolition assignments. Therefore, reconnaissance personnel should acquire basic training by attending demolition schools located throughout the Marine Corps.

(c) Weapons training and requalification. Familiarization training for the reconnaissance Marine includes firing all infantry weapons and annual marksmanship requalification training with the service rifle and/or pistol. Also included is instruction in the identification and characteristics of foreign weapons.

(d) Reporting routes of communication. Reconnaissance units are frequently assigned the task of reporting the natural and manmade characteristics of roads and bridges. Therefore, reconnaissance personnel must be familiar with basic road and bridge construction and classification.

(e) Communications training. Basic communications training for reconnaissance personnel involves classroom training in the characteristics of organic communications equipment and in the way this equipment is used by a reconnaissance team.

(f) Survival, evasion, resistance, and escape training. In general, reconnaissance units are not capable of providing the level of training offered by a formal course in survival, evasion, resistance, and escape training. However, this training is such a basic requirement for the reconnaissance Marine, that all newly assigned reconnaissance Marines should receive at least familiarization training prior to team assignment or shortly thereafter.

(g) Intelligence training. It's necessary that the reconnaissance Marine understands how his job pertains to intelligence production. Intelligence training for the reconnaissance Marine covers many subjects, including the ones listed on the following page.

1. Intelligence functioning and intelligence planning

2. Collection agencies and sources of information

3. Landing force intelligence requirements/EEI's

4. Capabilities and limitations of combat support units and their peculiar intelligence requirements

5. Counterintelligence

6. Handling of enemy documents, material, and prisoners

7. Recognition of foreign uniforms, equipment, and weapons

(h) Preliminary SCUBA training. Basic SCUBA diver qualifications may be acquired only at a formal Navy school. The reconnaissance Marine may or may not have had such training prior to his assignment to the reconnaissance unit. Therefore, local pre-SCUBA conditioning and familiarization training is conducted for reconnaissance Marines before their assignment to a formal SCUBA school. This training includes pool and open water instruction and is conducted according to Navy standards.

(2) Phase two: Advanced individual training. The majority of the advanced individual training is conducted concurrently with basic unit training. Advanced individual training is designed to improve proficiency. Basic unit training typically combines several operating techniques into elementary exercises. Various subjects are covered by both advanced individual and basic unit training, including the following.

(a) Physical training. Both unit physical fitness and basic individual physical fitness should be maintained. The entire unit should perform daily training to maintain a desired level of unit physical fitness. To ensure overall physical fitness, vary and alternate the type of physical exercise as appropriate. Approximately one hour per day of scheduled physical training is considered ample.

(b) Parachute training. Advanced individual parachute training consists of three weeks of formal airborne training, as prescribed by the Department of the Army. Subsequent parachute training covers several areas including familiarization with Navy and Marine aircraft normally used by reconnaissance units, preparation of individual equipment, and execution of day and night jumps using complete combat equipment and static-activated steerable parachutes.

(c) Swimmer equipment training. The reconnaissance team must be thoroughly familiar with all the equipment they will use in open water operations. Teams are familiarized and trained in the use of boats and related boat equipment.

(d) SCUBA qualification training. Marine Corps order 1500.16c contains information on the SCUBA qualifications and proficiency requirements.

(e) Surf and open water training. As individuals and teams gain confidence and ability as swimmers, the training program expands to surf and open water swimming. The training emphasis is on endurance and concealment in both heavy surf and calm water by each team member.

(f) Submarine training. Both day and night training should be conducted in the lockout and lockin techniques of leaving and entering a submerged submarine. Officers, SNCOs, and noncommissioned officers are trained in the operation of a submarine escape trunk.

(g) Inflatable boat handling. Marines are assigned to boat teams for training in handling inflatable boats during motorized, towing, launch, and recovery operations. Marines should remain with the same boat team throughout training.

(h) Reconnaissance patrolling. Teams are assigned missions which require the members to apply the skills they learned at basic individual training. This training emphasizes how the responsibilities and duties of the individual members contribute to the success of the team as a whole.

(i) Initial terminal guidance training. Initial terminal guidance is conducted on both the platoon and the team level. The platoon or team provides initial terminal guidance to assault helicopters. Training consists primarily of reconnaissance techniques employed in the general area of the helicopter landing zone, including marking helicopter landing sites, using pyrotechnics, and clearing minor obstructions and obstacles within the landing zone.

(3) Phase three: Basic unit training. Basic unit training is conducted to weld individuals into effective operating teams. Subject training, as mentioned previously, is conducted concurrently with advanced individual training.

(4) Phase four: Advanced unit training. Advanced unit training may be conducted in support of landing exercises planned by other units or during exercises planned and executed solely by the reconnaissance unit.

Unit off base training. When the same general area is used for both training and exercises, the team members often gain an artificial sense of confidence and capability. To avoid this false security, conduct the majority of training exercises on different beaches, drop zones, and other locations different from those used for the various exercises. Conduct at least half of the training and exercises at night. During this phase of training, teams should practice special landing, withdrawal, and recovery techniques, as well as evasion, escape, survival, and patrolling. The staff and service support elements should participate in training as appropriate.

Now that we have covered the four phases of progressive training, let's review. List the four phases of progressive reconnaissance training below.

(1) ____

(2) ____

(3) ____

(4) ____

If you said basic individual training, advanced individual training, basic unit training, and advanced unit training, you are correct.

1202. Battalion and Force Reconnaissance Selection

As a Marine, you have passed the initial test of completing boot camp. Now, prior to being assigned to a reconnaissance unit, you must meet additional prerequisites. The reconnaissance unit screens and selects the Marines being assigned to it. Listed on the following page are the items which the reconnaissance units test and review during the selection process.

a. Selection from School of Infantry. If a Marine is currently enrolled in the SOI, prior to graduation a reconnaissance team will come to the school and provide the entire SOI class with an introduction and orientation to the duties of the reconnaissance Marine. At the conclusion of the presentation, the names of those Marines interested in participating in the screening will be taken.

Depending upon which reconnaissance unit conducts the screening, the test may vary slightly. The screening process will include the following, with the possible exception of numbers 2 and 3.

(1) Completing the S-1 swim test

(2) Treading water while holding a 10 lb weight overhead

(3) Carrying a weapon during the 25 meter water crossover

(4) Completing the Marine Corps PFT with a first class score

(5) Screening the SRB, checking for pro/con marks, office hour entries, and derogatory page 11 entries

(6) Obtaining a GT score of 110, which may be waived to 100

If you are selected, you will either be assigned to a force or to a battalion reconnaissance company, depending upon the needs of the units.

b. Selection from a Fleet Marine Force unit. Screening is conducted on a regular basis at the reconnaissance unit. Again, depending on the unit, the screening may vary slightly. Once the screening is complete and the Marine has been selected, submit an administrative action (AA) form through your command. The needs of your current unit and the needs of the reconnaissance unit will both play an important part of the reassignment.

Lesson Summary. During this lesson, we have covered the four progressive phases of reconnaissance training and the screening process used to select Marines from SOI and the FMF units. Now that you have a general idea about Marine reconnaissance, we will move on to specific equipment used by the reconnaissance teams.

Unit Exercise: Complete items 1 through 6 by performing the action required. Check your responses against those listed at the end of this study unit.

1. Identify the primary mission of the force reconnaissance company.

   a. Conduct ground reconnaissance and observation in support of a Marine division and its elements.
   b. Conduct preassault and deep postassault reconnaissance in support of a landing force.
   c. Harass and slow down enemy movement.
   d. Conduct overt intelligence gathering operations for the allied force.

2. Identify the organization of the force reconnaissance company.

   a. Headquarters platoon, supply and service platoon, and reconnaissance platoons
   b. Headquarters platoon, supply and service platoon, and parachute platoon
   c. Headquarters platoon, headquarters and service company and reconnaissance platoon
   d. Direct action platoon, supply and service platoon, and helicast platoon

3. Identify the primary mission of reconnaissance battalion.

   a. Conduct preassault and distant postassault reconnaissance in support of a landing force.
   b. Conduct overt intelligence gathering operations for allied forces.
   c. Harass the enemy by conducting raids and ambushes.
   d. Conduct ground reconnaissance and observation in support of a Marine division and its elements.

4. Identify the organization of the reconnaissance battalion.

   a. Headquarters and service company, and direct action platoons
   b. Headquarters and service company, and reconnaissance company
   c. Headquarters and service platoon, and reconnaissance platoon
   d. Headquarters and service platoon, and direct action platoons

5. Identify the four progressive phases of reconnaissance training.

   a. Unit clandestine training, unit integrity training, individual training and advanced unit training
   b. Basic individual training, advanced individual training, basic unit training and advanced unit training
   c. Advanced training, unit training, patrol activity training, and clandestine training
   d. Basic individual training, advanced individual training, basic training, and regimental training

6. Identify the organization which selects reconnaissance personnel.

   a. The reconnaissance HQ section
   b. The battalion S-1
   c. The reconnaissance unit itself
   d. Headquarters Marine Corps

UNIT SUMMARY

During this study unit, you have covered the mission and organization of force and battalion reconnaissance units along with the screening and training of Marines for reconnaissance duties. The next study unit will cover ground photography and field sketching.

Study Unit 1 Exercise Solutions

		Reference
1.	b.	1101a
2.	a.	1101c
3.	d.	1102a
4.	b.	1102c
5.	b.	1201c
6.	c.	1202

STUDY UNIT 2

GROUND PHOTOGRAPHY AND FIELD SKETCHING

Introduction. When reconnaissance teams bring back the information gained from their missions, sometimes they cannot agree on what they have seen. In such cases, photographs and sketches are very important. However, keep in mind that photographs and sketches only supplement and do not replace the reports of a reconnaissance team on what they have observed.

Ground photography is usually the simplest and most reliable way to record information. Using the camera, plus sketching skills, help reconnaissance Marines perform their mission. Although reconnaissance teams use a variety of equipment, this course can cover only certain pieces. During this study unit you will learn about the Nikonos V camera, basic photography, and field sketching.

Lesson 1. GROUND PHOTOGRAPHY

LEARNING OBJECTIVES

1. Match each general camera term with its appropriate definition.

2. Given an illustration of a Nikonos V camera, match the nomenclature name with the correctly labeled part.

3. Identify the proper sequence of steps to prepare a Nikonos V camera for operation.

4. Given a photographic situation, identify the appropriate exposure mode to use.

5. Identify the proper sequence of steps to follow to unload the Nikonos V camera.

2101. General Photographic Terminology

Although the reconnaissance Marine is trained to observe and report in detail what he has seen, he is not always able to do so either due to enemy contact or time restraints. One of the many tools used to help record data concerning the enemy is the camera. As a reconnaissance Marine, you will use the Nikonos V camera; a very durable and versatile piece of equipment. However, prior to using the Nikonos V camera, you must understand basic photographic terminology. Listed on the following page are definitions of general photographic terms you will need to know to use the Nikonos V camera.

a. Camera. A camera may be defined as a light machine which gathers and focuses reflected light onto film for a period of time. In its simplest form it consists of a lens, a shutter, an aperture, a film plane, and a light tight box.

b. Film. A sheet of cellulose acetate coated with radiation sensitive emulsion for taking photographs. Film comes in three basic types: color, black & white, and infrared.

c. ISO (International Standards Organization). The ISO refers to how fast the chemical emulsion on the film will accept light. ISO ratings range from ISO 32 to ISO 3000. The higher the ISO rating, the less light is required to make a photograph. However, the prints of photographs made under these conditions (less light and higher ISO rating) will appear grainy when enlarged. If a photograph is made using a lower ISO rating, the prints can be enlarged with more detail, but more light is required during the exposure.

d. Aperture. Aperture is an adjustable opening in an optical instrument that limits the amount of light passing through a lens. The amount of light is determined by the f-stop numbers, which range from 2.5 to 22. The higher you set the f-stop number, the smaller the aperture will be. A small aperture allows less light through the lens, which is used during sunnier conditions. The lower you set the f-stop number, the larger the aperture will be. A large aperture allows more light through the lens, which is required to properly expose film during darker conditions.

e. Shutter speed. This refers to the opening and closing of a device inside the camera that regulates the length of time the film will be exposed to light. Shutter speeds range from 1/1000 to 1/30 of a second. A fast shutter speed will freeze movement. A slower shutter speed is required to achieve more detail and is used in low light.

f. Depth of field. This refers to the zone that extends from in front of the subject to behind the subject that will appear to be in focus as you look through the camera. The higher you set the f-stop, the greater the depth of field will be. The closer the subject, is to the camera the smaller the depth of field will be.

g. Exposure control. This is accomplished by a combination of ISO, shutter speed, and f-stop setting. The following combinations will produce the same exposure:

• ISO	25	50	200	250	300
• Shutter speed	1/1000	1/500	1/250	1/125	1/60
• F-stop	4	5.6	8	11	16

2102. Nikonos V 35mm Camera

The Nikonos V 35mm underwater camera functions at depths up to 160 feet below the surface. Its ruggedness makes it suitable for land reconnaissance missions in adverse weather conditions such as rain and snow.

The legend below describes the function for each camera part and provides a reference number which matches an illustration of that part in the accompanying foldout figure(s) 2-1.

NAME OF PART	DESCRIPTION OF FUNCTION	REFERENCE NUMBER
Shutter speed/Mode selector dial	One of five modes can be selected. May be set for Manual, Automatic, Bulb, Rewind, and M90.	1
ASA/ISO film speed dial	Provides ASA/ISO setting from 25 to 1600. Film speed dial is set by lifting the knurled ring and rotating it until desired speed is opposite the white index mark.	2
Film rewind crank	Rewinds the film in the camera.	3
Film advance lever	Advances the film and cocks the shutter. Stroke the lever counterclockwise, until it stops. When all frames have been exposed, the lever will stop advancing.	4
Shutter release lock lever	Prevents waste of film and battery drain by accidentally depressing the shutter.	5
Shutter release button	Releases the shutter and activates the light emitting dial (LED) exposure meter when depressed halfway.	6
Frame counter	Counts exposed frames from 1 to 36. Starting symbol "S" appears automatically as soon as the camera back is open. Two dots between "S" and "1" indicate blank exposures.	7

Located inside the camera are certain functioning parts that are described below and pictured below in figure 2-2.

NAME OF PART	DESCRIPTION OF FUNCTION	REFERENCE NUMBER
Pressure plate	Used to keep film flat and protect the shutter curtains. Depress the safety catch and then lift up.	1
Cartridge chamber	Where the film is placed.	2
Rewind fork	Used to rewind the film.	3
Advance sprockets and take up spool	Takes up the film as it is used.	4

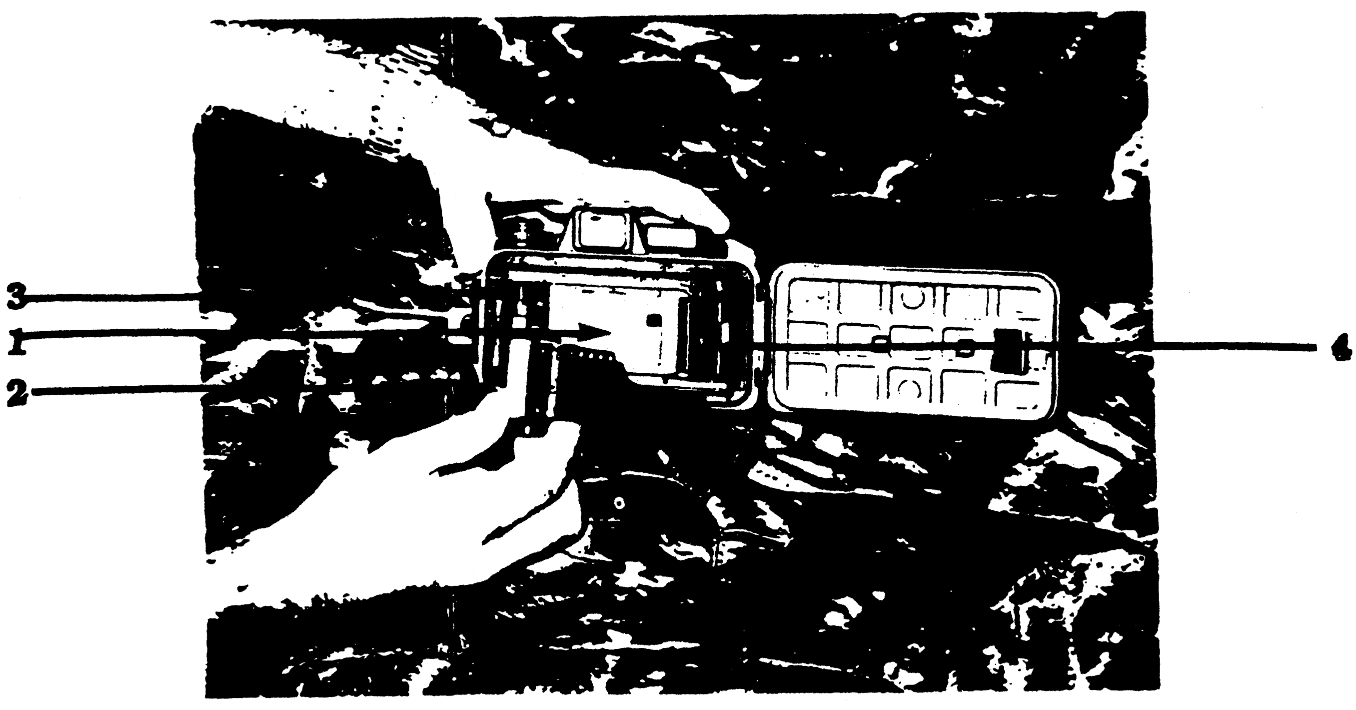


Fig 2-2. Nikonos internal parts.

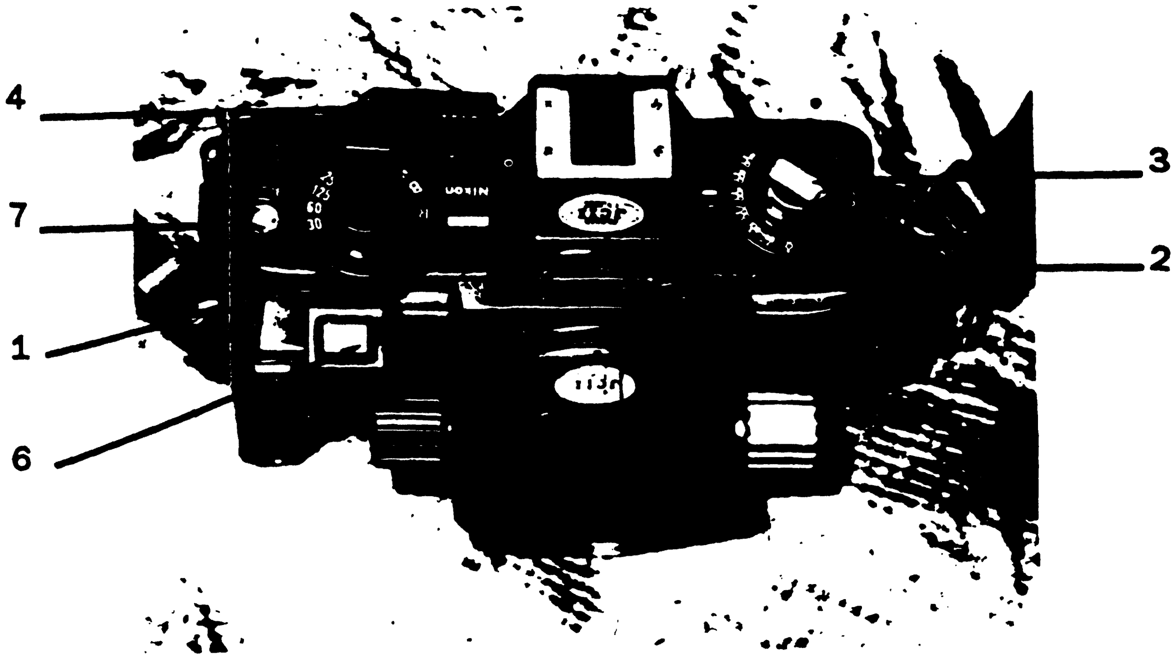
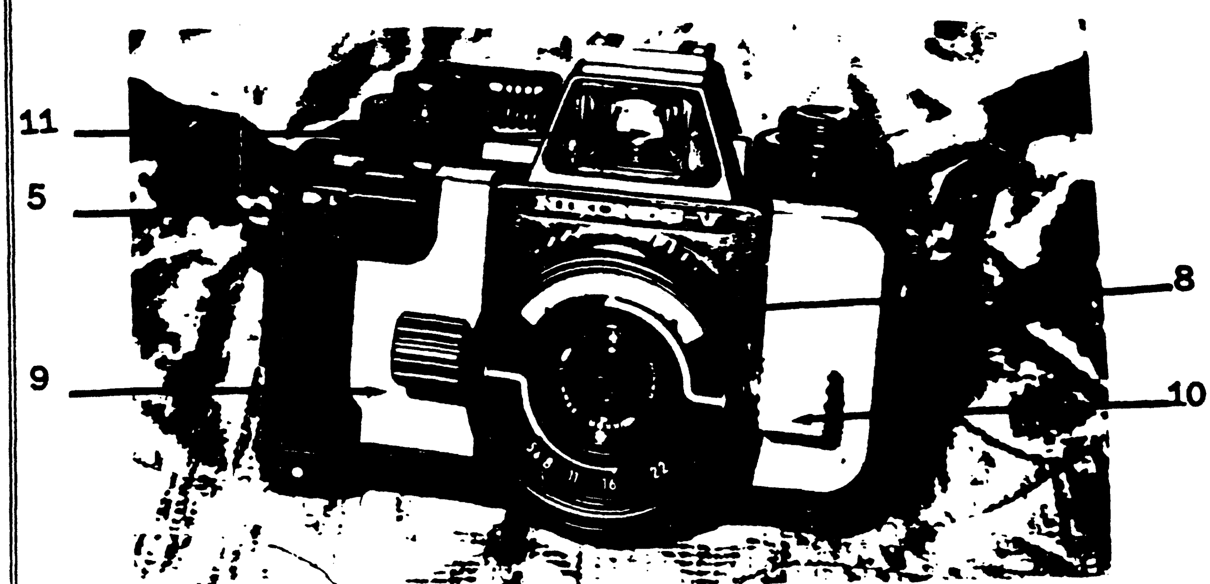


Fig 2-1. Nikonos V external parts.



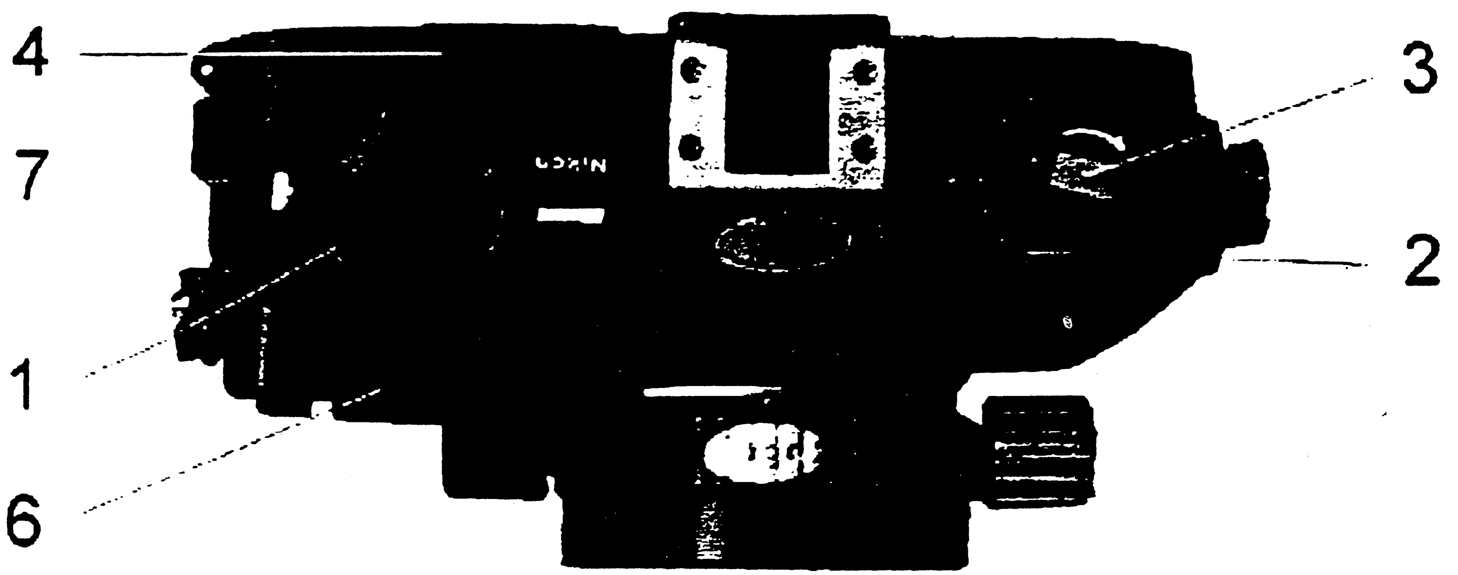
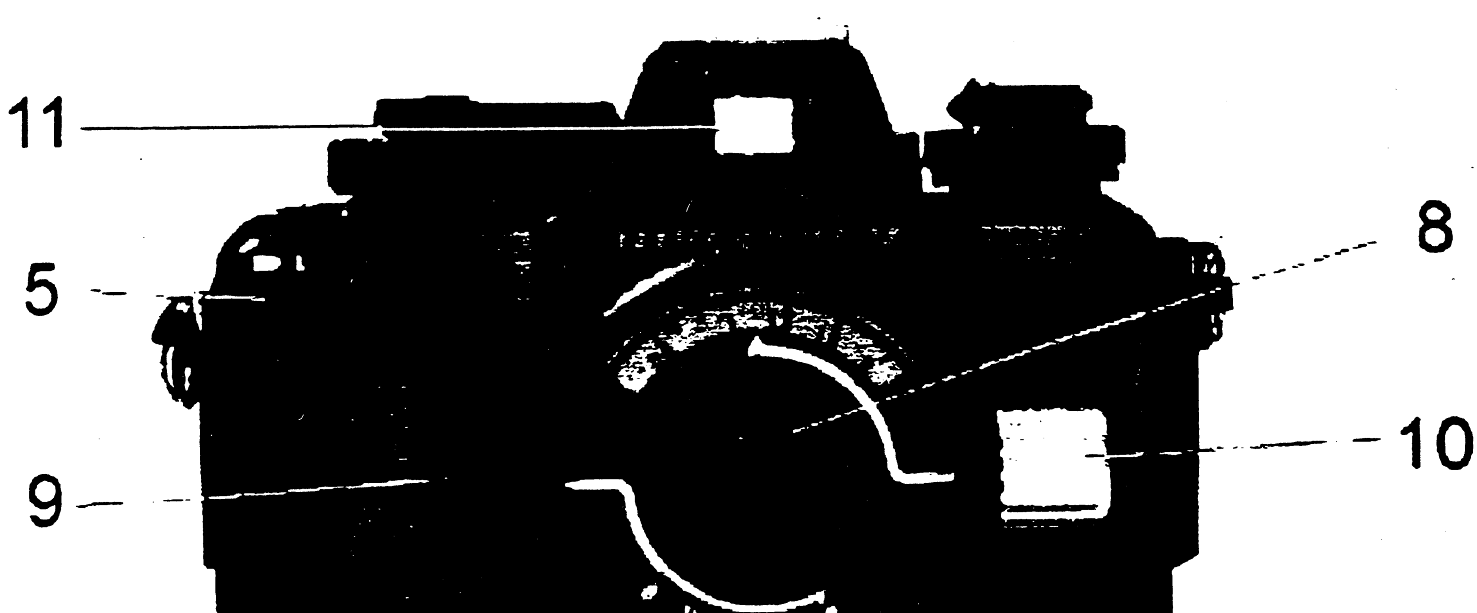
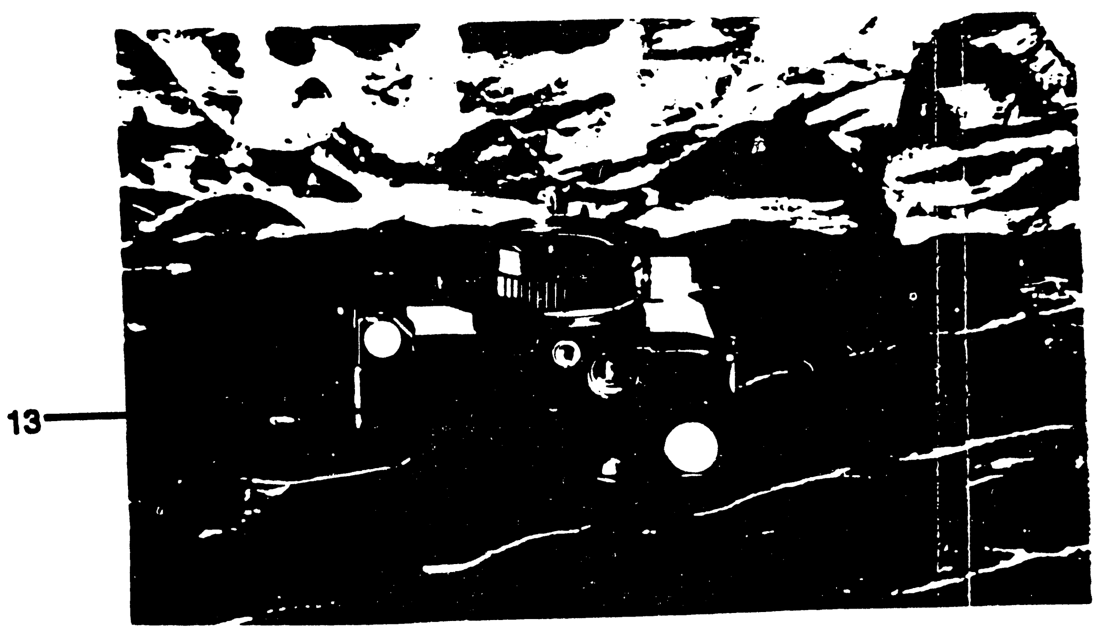


Fig 2-1. Nikonos V external parts

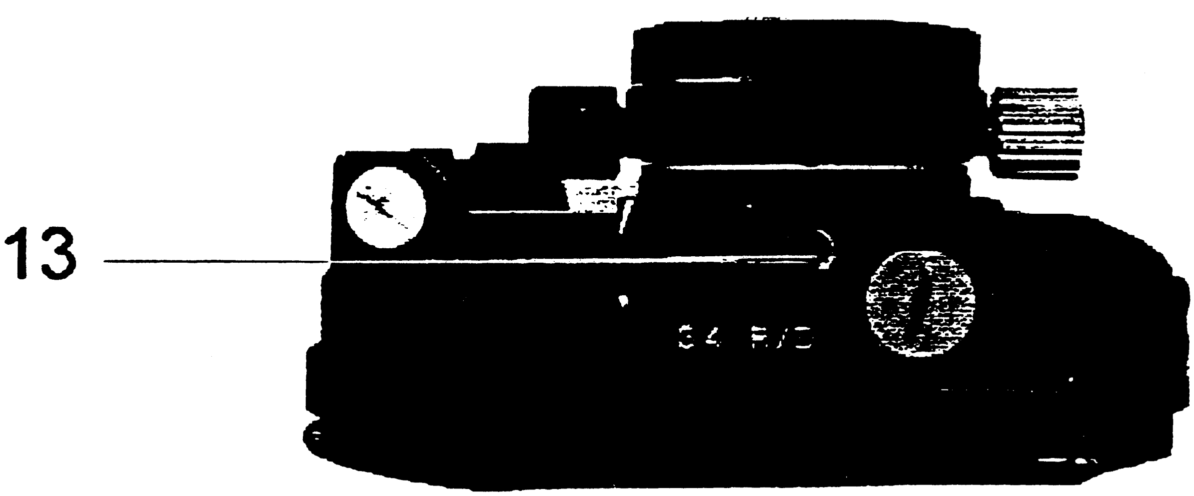


Nikonos V external parts--cont'd.



NAME OF PART	DESCRIPTION OF FUNCTION	REFERENCE NUMBER
Lens	Standard underwater and land lens. Other lenses can be attached.	8
Lens aperture knob (Black knob)	Sets the aperture opening by aligning the f-stop number with the index. The pincher-type depth of field indicator automatically gives range that will be in focus with the desired f-stop.	9
Lens focusing knob (Silver knob)	Focuses the subject by manually setting the distance to the index.	10
Viewfinder	Square frame which you look through when focusing. LED located at the bottom of viewfinder indicates shutter speeds and warns of possible under or over exposure.	11
Camera back release/ lock button	Opens and closes by turning the release/lock latch 90 degrees in direction of the arrow while de- pressing orange release/lock latch.	12
Battery Chamber	Houses one alkaline battery.	13

Nikonos V external parts--cont'd



2103. Camera Preparation

Like any mechanical equipment, the Nikonos V must be prepared for use. The following procedure should be performed prior to each use and especially when the camera has been inoperative for a period of time. To prepare the camera for operation follow these four steps.

a. <u>Install batteries</u>. Operative batteries are an essential factor in camera preparation. Prior to installing the batteries, wipe the terminal clean.

b. <u>Mount lens</u>. To mount any lens, position the black aperture knob vertically in front of the viewfinder and push the lens firmly into the bracket mount (fig 2-3). Turn the lens 90 degrees clockwise until the lens clicks into position.

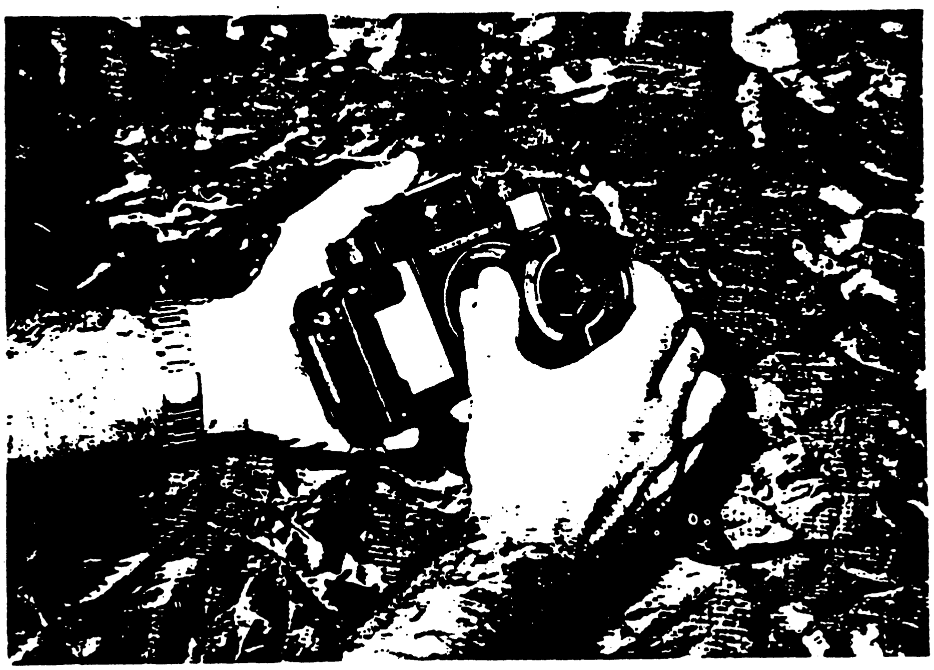
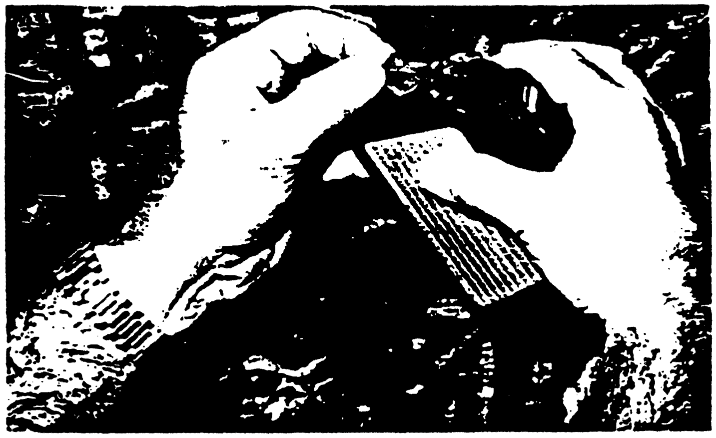


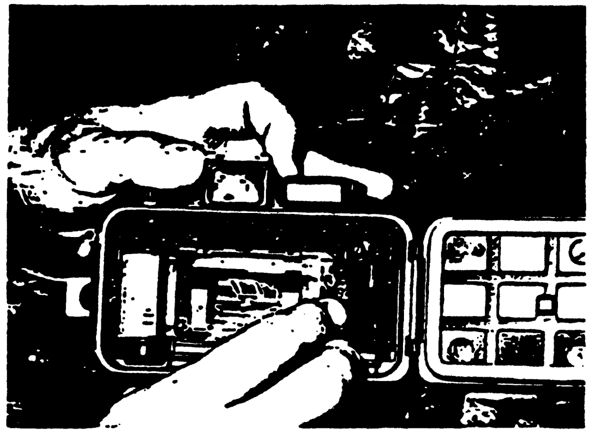
Fig 2-3. Mounting lens on the Nikonos V.

c. <u>Load film</u>. To load film into the Nikonos V camera, follow the steps (1 through 6) and illustrations on the following pages.

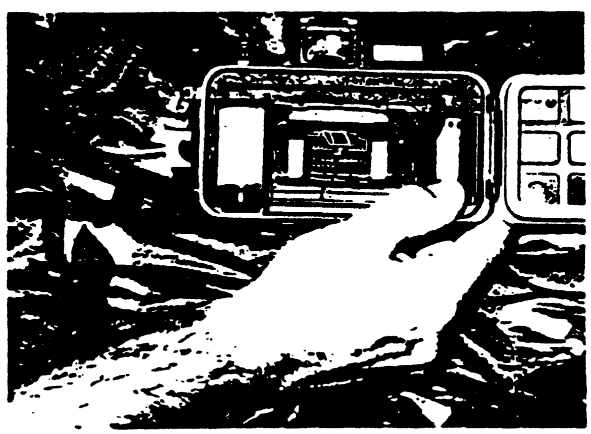
STEP	ACTION
1	Unlock and open camera back.
	

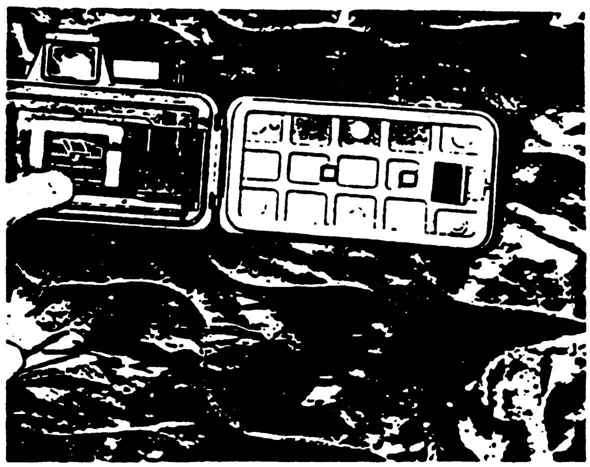
2	Depress the safety catch then lift up the pressure plate and install the film cartridge into the cartridge slot.
	

STEP	ACTION
3	Pull leader (end of film) across camera back and insert into take-up spool.



4	Advance take-up spool with your fingers. Advance the film with the film advancer.



STEP	ACTION
5	Check the film pressure plate to ensure it is closed securely in its original position.
	

6	Close and lock camera back. Take up film slack by advancing film until frame counter shows "1".
	

d. Check battery power. To check the battery power, set the ISO/ASA film speed dial to the same ISO/ASA of your film. Gently depress shutter release button halfway to activate the exposure meter. Using the battery meter readings troubleshooting guide on the following page, determine the proper action to take.

IF the LED light	THEN You
blinks for more than 16 seconds	have sufficient power
blinks for less than 16 seconds	change battery or shoot in "M90" mode
does not blink	change battery or shoot in "M90" mode

List the four steps to prepare the Nikonos V camera for operation.

(1) ____________________

(2) ____________________

(3) ____________________

(4) ____________________

If you wrote install batteries, mount lens, load film, and check battery power, you are correct.

2104. Exposure Modes

Imagine that you have been assigned as the photographer for a practice mission. Before you attempt to use your newly acquired skills, we need to discuss the exposure settings of the Nikonos V camera. Using the correct setting can result in the difference between a perfect photograph or a photograph which leaves a lot to be desired. Let's begin with Automatic.

a. Automatic (A) setting. When you use this setting (fig 2-4), the camera will automatically control the shutter speed, depending on the lighting conditions. Basically, this means the aperture will be set for you. If you are an unexperienced photographer, using this mode takes the guesswork out of controlling the shutter speed.

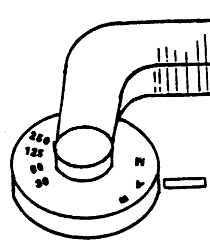


Fig 2-4. Automatic setting.

Let's go over the steps for setting the camera in the automatic exposure setting.

(1) Set the shutter speed/mode selector dial to the "A" (automatic) position.

(2) Turn the lens aperture knob to the desired f-stop setting.

(3) Estimate the distance between the camera and the subject and focus the camera.

(4) While looking through the viewfinder, depress the shutter release button halfway. An LED indicator will light up indicating the shutter speed the camera has selected. Use the following troubleshooting guide to determine your next step.

IF	THEN YOU
any LED number lights up	take the picture.
overexposure warning arrow blinks red and **points to the left**,	adjust the aperture to a higher f-stop setting.
underexposure warning arrows blinks red and **points to the right**,	adjust the aperture to a lower f-stop setting.

b. Manual (M) setting. When using the manual setting, you have the option of selecting both the shutter speed and the aperture setting. This means you must select the appropriate shutter speed and appropriate setting for each picture (fig 2-5). This setting allows you to take advantage of your ability to select shutter speed and aperture setting to achieve particular results.

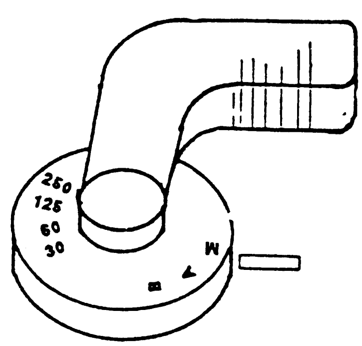


Fig 2-5. Manual exposure setting.

Let's go over the steps for using the manual exposure.

(1) Estimate the distance between the camera and the subject and focus the camera.

(2) Select the settings for desired shutter speed and f-stop.

(3) Look through the viewfinder and gently depress halfway the shutter release to activate the LED. The shutter speed you selected will appear. If a different shutter speed is blinking, this means the camera has determined that the blinking speed is the best speed for the photographic situation. To obtain correct exposure, rotate the lens aperture knob or shutter speed/mode selector dial until one LED number is on.

c. M90 (M90) setting. When you use this setting, the shutter is mechanically released at 1/90 of a second. This setting can also be used when the batteries are weak, exhausted or not loaded in the camera.

d. Bulb (B) setting. At this setting, the shutter will remain open for as long as the shutter release button is depressed. "B" is especially useful for making long time exposures with a cable release and tripod.

e. Rewind (R) setting. This setting disengages the film sprocket drive to permit film rewinding.

2105. Unload the Nikonos V Camera

Once all the film is exposed or the mission is completed, unload the camera following the steps below.

STEP	ACTION
1	Set the speed/mode selector to the "R" setting. This disengages the film socket drive.
2	Lift up the film rewind crank and rotate it in the direction of the arrow to secure it.
3	Continue rewinding until you feel resistance. Continue two or three more turns.
4	Open the camera back and remove the film.
5	Place film in a air tight container or in the original container.
6	Close and lock camera back.

Since we have covered the six steps to unload the camera, let's review. List, in order, the steps to unload the camera.

(1)____

(2)____

(3)____

(4)____

(5)____

(6)____

The correct unloading steps are: (1) set the speed/mode selector to the "R" setting, (2) lift up the film rewind crank and rotate it in the direction of the arrow, (3) continue rewinding until you feel resistance, (4) open the camera back and remove the film, (5) place film in airtight container, and (6) close and lock camera back.

<u>Lesson Summary</u>. During this lesson you have learned to use the camera. The next lesson, will discuss rules of photography and how to complete the photo log and the photo data sheet.

Lesson 2. TECHNIQUES OF GROUND PHOTOGRAPHY

<u>LEARNING OBJECTIVES</u>

1. List the three types of photographic views required to provide satisfactory ground photography.

2. Given a scenario, select the appropriate technique of photography to accomplish the mission.

3. Identify the purpose for maintaining a photo log.

4. Given a photo data sheet, complete it by matching the numbered information to the correctly labeled block.

2201. General

Ground photography is usually the simplest and most reliable method of gaining information. However, when photographs cannot be taken, other information sources, such as field sketching, must be exploited. Regardless of the source used, be sure to document the following.

- The exact location, indicated on a six or eight digit grid

- The exact measurement, indicated in meters, feet, or yards

- The particular orientation, including a north-seeking arrow, prominent terrain features, buildings, and bridges in the area

- The time and date

2202. Characteristics of Ground Photography

After observation, you will determine which road, beach, or activity has military importance. Next, photograph it, bringing out the important features. Then add some field notes providing details such as geographic location, orientation, time, date, exact measurements, elevation (including height of an object), and the relationship between the shape of the structure and its use. Again, keep in mind that this information cannot always be determined from photography alone.

a. Composition. You alone know what you are trying to show concerning the subject. Draw attention to it. Usually the subject is centered in the photograph. If it is not, indicate the subject by making notes on the print or making an overlay. Do not assume that the interpreter will immediately spot the information you captured just because it is obvious to you.

b. Coverage. If possible, make your photograph tell a complete story by showing not only the general appearance but also the relationship to surrounding terrain, manmade features, size, shape, and construction. This may require several different views. By using the different types of views illustrated below, you can capture essential information and provide satisfactory ground photography.

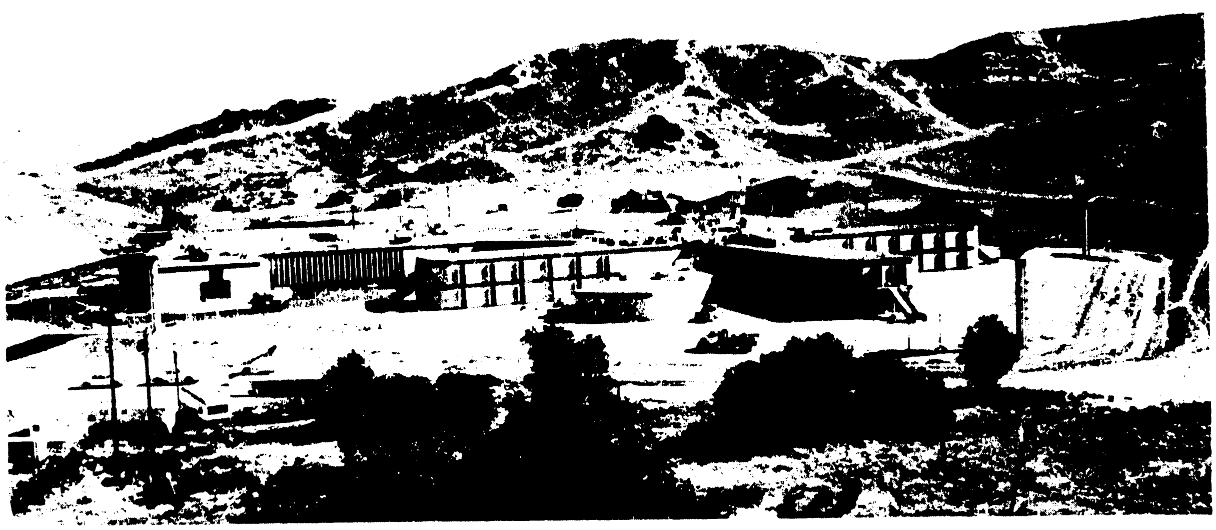


Fig 2-6. The distant view.

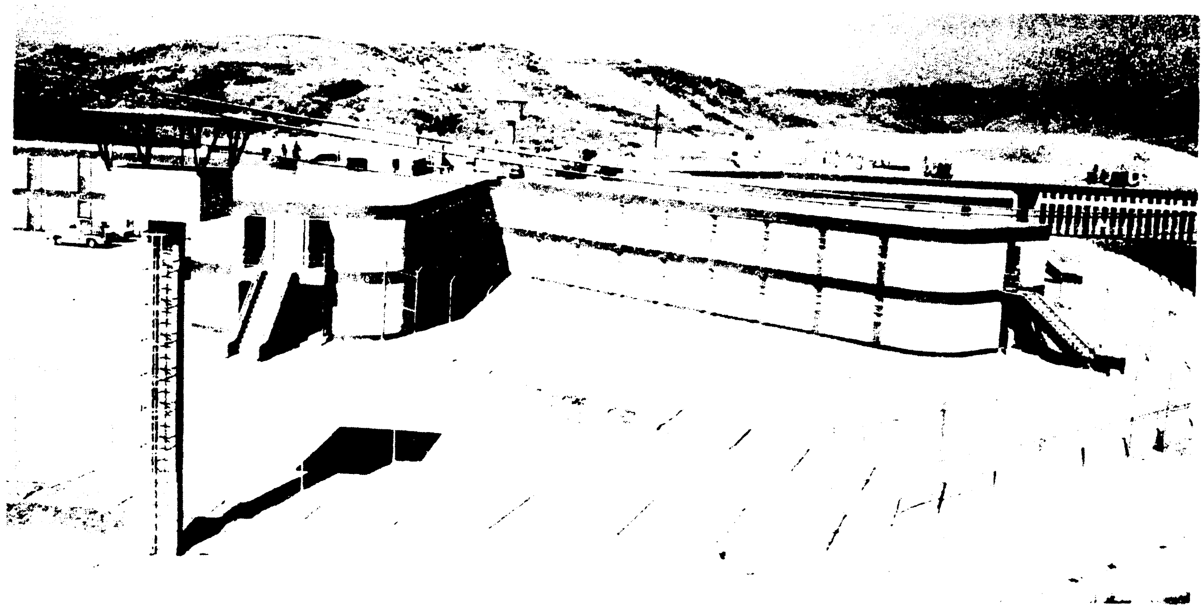


Fig 2-7. The medium view is also called the follow in shot.

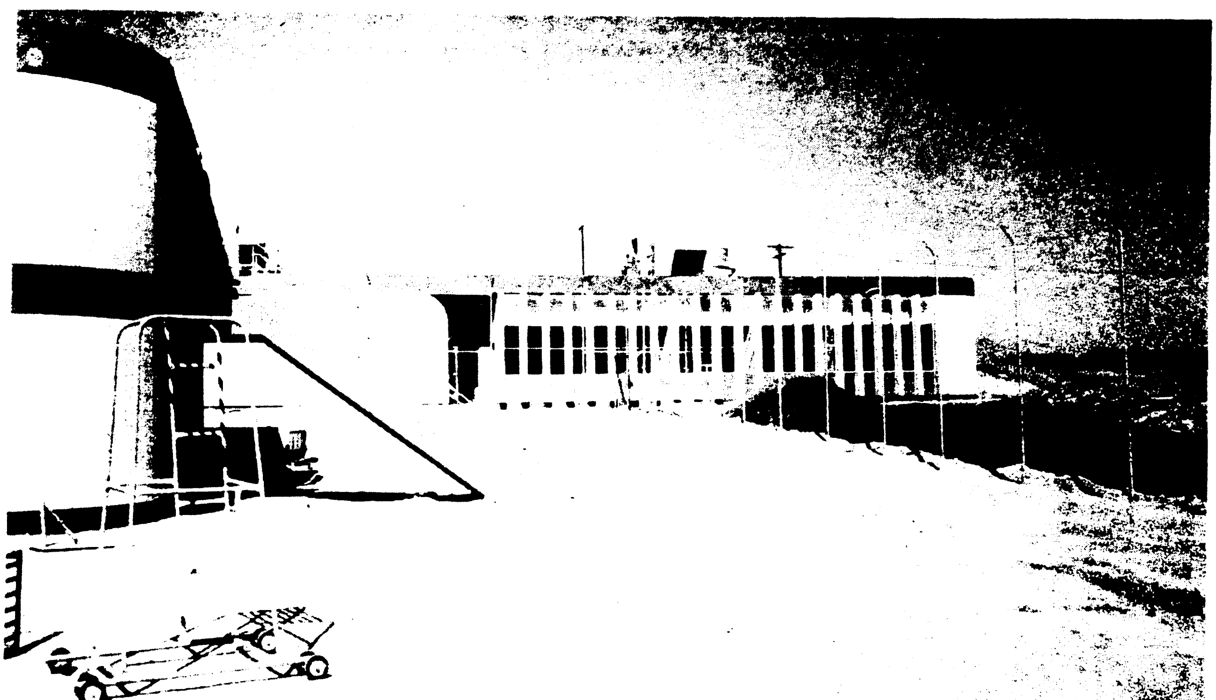


Fig 2-8. The closeup is also called the detail view or the structural shot.

c. Detail. Learn the performance characteristics of your camera. Find the most satisfactory exposure setting, then use it. If you have to take photographs in adverse weather conditions, do not worry about the quality of your negative. Use adequate exposure. If in doubt, overexposure correction can be made during developing, and good prints can be made by the intelligence personnel. It is up to you to keep the lens clean and the picture in focus. Focus carefully to show detail. Special features, such as the construction of roadbeds, building materials, fabrication methods, or details of soil should be photographed as closely as focusing will permit. Normally, a medium view to show overall appearance will also be required.

d. Horizon. In distant views and particularly in beach photography, where such things as general appearances, large areas, and landmarks are being shown, include the horizon whenever possible.

e. Scale. In showing both appearance and detail, get in the habit of including an object of known size. You can use an extended measuring tape, familiar objects, items of clothing, equipment, weapons, or people. Lesson 3, "Field Sketching," of this chapter covers this topic further.

2203. Equipment

There is no simple way to tell you what to look for. You must use your own judgment and imagination, and be perceptive in your observations. In addition to the camera, which is included in the table of equipment of the Marine reconnaissance units, the team member assigned as the cameraman should be sure he has the following equipment.

(a) Film. Listed below are the advantages and disadvantages of using the different types of film.

FILM TYPE	ADVANTAGES	DISADVANTAGES
Color	Comes in slide or print. Good for showing a lot of detail.	Requires dark room and special equipment for processing.
Black and White	Can be processed in all dark rooms with minimum special equipment. Can be processed in the field, if required.	Does not show a lot of clear detail.
Infrared	Can be used effectively at night.	Must have total darkness for use.

(b) Photo log. Use the photo log to keep track of all pertinent information concerning the photographs taken, then use to complete the photo data sheet after the mission.

(c) Lens, lens paper, filter.

(d) Watch

(e) Compass

(f) Pen, pencil, notepad

2204. Photographic Techniques

Additional difficulties may arise in photographing the subject. The subject may be inaccessible, too distant, or too near. Consequently, it may be too small or too large for the camera's field of view. To help overcome these problems, use the photographic technique, panorama views.

a. Panorama views. These are a series of overlapping photographs which may be attached end to end to provide a composite view of a large area. While on a recon operation, you may very likely become handicapped by a photographic problem such as the one mentioned before. Therefore, you must obtain a panoramic view of the subject. To do this, move to an area of observation with an unobstructed view, focus at infinity, and take several, carefully exposed, overlapping views (that is, a panorama). Let the interpreter worry about the detail, or you may provide it by means of additional views. Medium views and closeups are desirable if you can take them; if not, annotate points you want noticed. There are other techniques to obtain specific panoramic photographs. We will discuss the sweep panorama, used to photograph large areas, and the 360 degree panorama, used to photograph a full 360 degrees.

b. Sweep panoramas. Sweep panoramas are those views in which the photographer stands at one point and rotates the camera with each succeeding photograph so that the area in the viewfinder overlaps that covered in the previous exposure (fig 2-9).

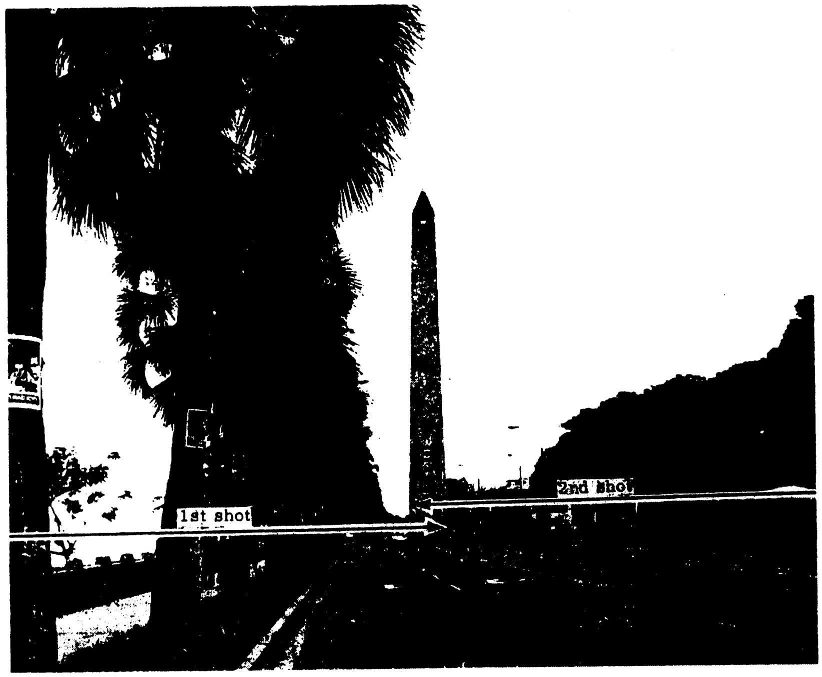


Fig 2-9. Sweep panorama.

c. <u>360 degree panorama</u>. A 360 degree panorama is a sweep panoramic view for the full 360 degrees. It is possible to take relative azimuths from such photographs after assembling them. For example, assume that when the photographs are pasted together, the entire 360 degree panorama measures exactly 18 inches. Each inch on the photograph represents approximately 20 degrees. Therefore, the relative azimuth between two points can be approximated.

When north is known, relative azimuths become true azimuths. If two 360 degree panoramas are taken from nearby hills, the terrain shown in both sets of views can be mapped with fair accuracy.

So far we have explored two areas. We have discussed the different methods available to enhance your ability to take better photos and we went over the rules of photography. Now, let's review. What are the three types of views required to provide satisfactory ground photography?

(1) ______________________________

(2) ______________________________

(3) ______________________________

If you answered distant, medium, and closeup views, you are correct.

2205. Photo Log

a. Purpose of photo log. Documentation of the photo mission is the most important step in reporting the essential data. Without pertinent data, photos are mere curiosities. But by providing the data, you create a source of intelligence. The photo log allows the photographer to provide adequate and accurate data, which the interpreter can later use to provide adequate and accurate intelligence.

b. Photo log: Components, Completion, and Use. The photo log helps the photographer process data after the mission. The photographer fills out the log during the mission and uses it to make photo annotations, overlays, and complete the photo data sheet (fig 2-10). The following information is usually found in a photo log.

(1) Photographer. Name of the Marine taking the picture.

(2) Target. Name the object photographed.

(3) Camera/lens. Name the camera name used.

(4) Type of film. State the type of film used.

(5) ASA used. State the number of ASA used.

(6) Lighting/conditions. State the weather conditions (cloudy, hazy, sunny, etc.)

(7) Exposure number. State the exposure number of the photo (first picture taken, second picture taken, etc.).

(8) DTG. State the day time group.

(9) Shutter speed. State the shutter speed setting used.

(10) F-stop. State the f-stop setting used.

(11) Range in meters. State the range in meters from the camera to the object from your position.

(12) Azimuth (magnetic). Provide the magnetic azimuth to the object from your position.

(13) Grid coordinates of target. State the six or eight digit grid coordinates.

(14) Remarks. State additional remarks pertinent to the photograph.

On the following page is a completed photo log with labeled parts.

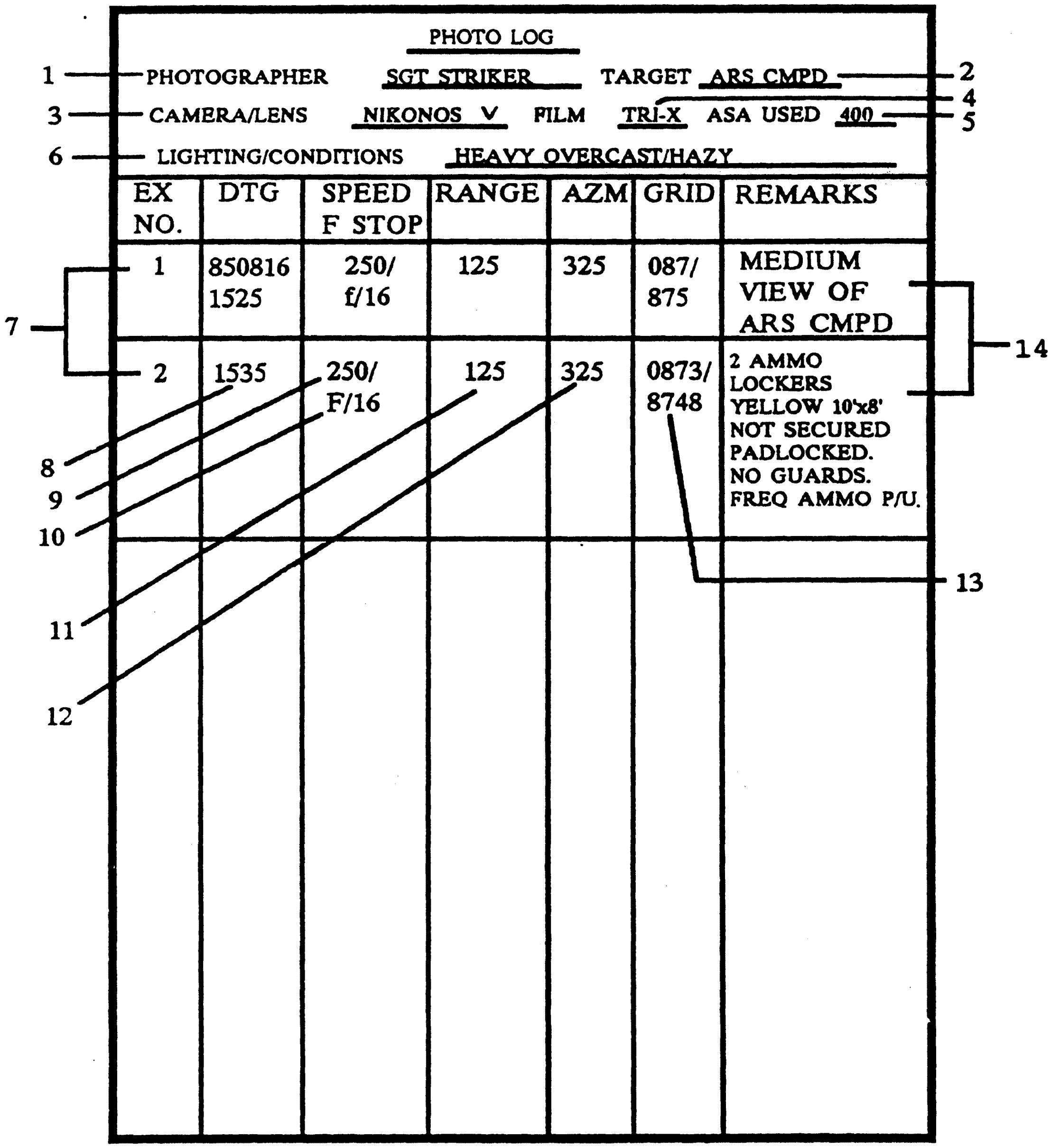


PHOTO LOG

PHOTOGRAPHER SGT STRIKER TARGET ARS CMPD

CAMERA/LENS NIKONOS V FILM TRI-X ASA USED 400

LIGHTING/CONDITIONS HEAVY OVERCAST/HAZY

EX NO.	DTG	SPEED F STOP	RANGE	AZM	GRID	REMARKS
1	850816 1525	250/ f/16	125	325	087/ 875	MEDIUM VIEW OF ARS CMPD
2	1535	250/ F/16	125	325	0873/ 8748	2 AMMO LOCKERS YELLOW 10'x8' NOT SECURED PADLOCKED. NO GUARDS. FREQ AMMO P/U.

(1) Photographer
(2) Target (in general)
(3) Camera/lens
(4) Type film
(5) ASA used
(6) Lighting and conditions
(7) Exposure number
(8) DTG (day time group)
(9) Shutter speed
(10) F-stop
(11) Range in meters
(12) Azimuth (magnetic)
(13) Grid coordinates of target
(14) Remarks

Fig 2-10. Completed photo log.

2206. Photograph Data Sheet

The reconnaissance Marine uses the photo data sheet to amplify information on photographs which are turned in for intelligence interpretation.

a. <u>Photograph data sheet</u>. Figure 2-11 shows a completed photograph data sheet.

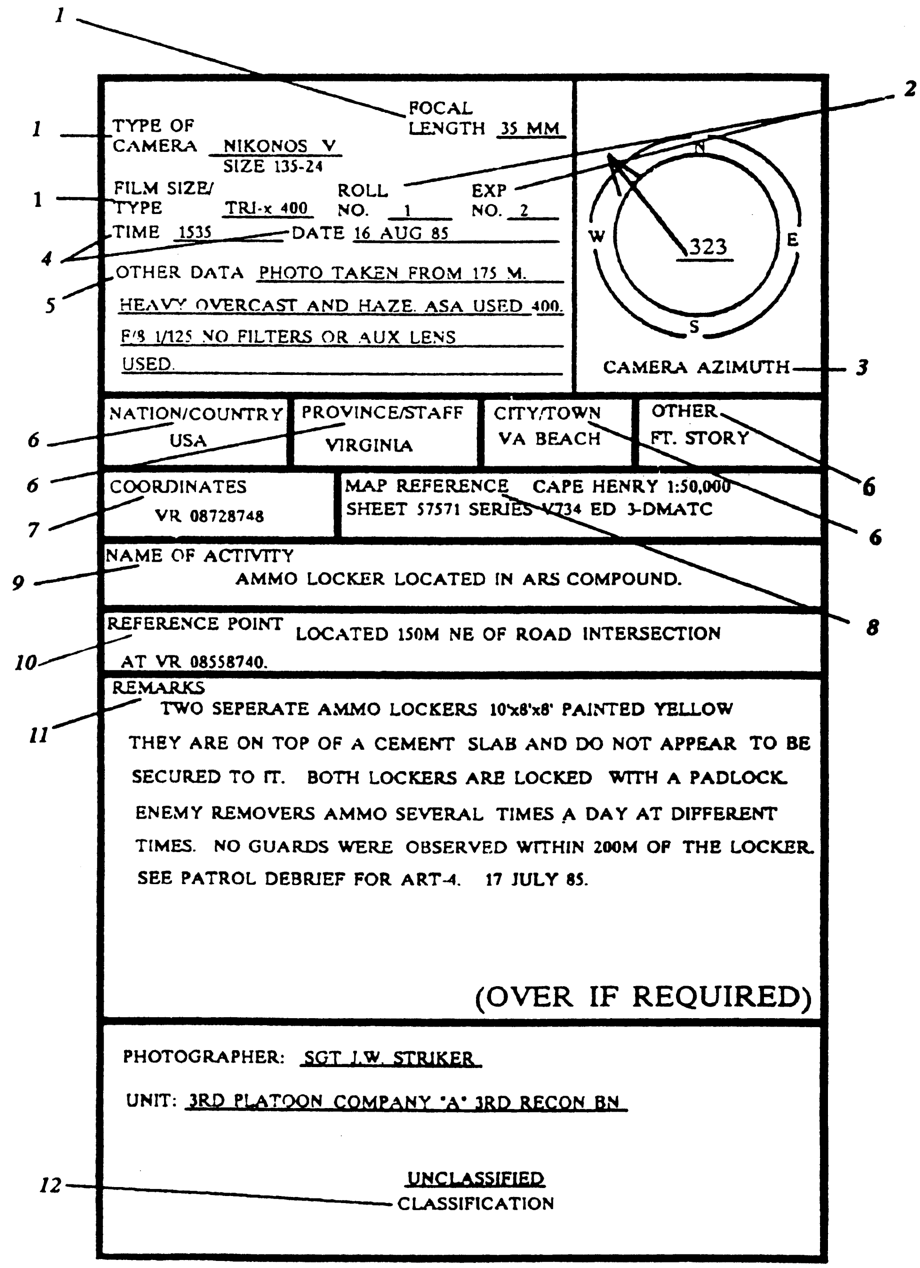


Fig 2-11. Completed photograph data sheet.

(1) Type of camera, focal length, and film size. Fill in the camera name and type, providing the focal length (distance from the lens to the film) in inches or centimeters. This information is essential for making measurements from the photographs. Do not repeat this information on succeeding sheets if the series of exposures was made with the same equipment.

(2) Roll number and exposure number. Number each data sheet to match corresponding exposure or print. Unidentifiable photographs are of limited use.

(3) Camera azimuth. Camera azimuth refers to the direction in which the camera is aimed. Show direction by printing the azimuth in degrees.

(4) Time and date. Record the Greenwich time and date. Indicate the day photographs were taken, not the day they are processed or transmitted.

(5) Other data. Give the approximate distance from the camera to the subject. Provide references to other photographs or intelligence reports. Note the use of filters, auxiliary lenses, or other conditions which may affect the photography.

(6) Nation/country, province/state, city/town, other. Provide enough geographic information to locate the subject accurately. In the space marked "other," indicate the part of town or the street location. Do not repeat this information if a series of photographs covers the same area.

(7) Location coordinates. Provide coordinates as accurately as possible, particularly in the case of isolated activities.

(8) Map reference. If a reference map is used, give the name, the scale, the area shown, the producing agency or source, and the edition date. This information is essential if a foreign map series is used.

(9) Name of activity. The activity is also referred to as the area or subject. Give complete and exact military or commercial nomenclature. Pinpoint the location by providing distance and direction from a known landmark.

(10) Reference point. Locate a recognizable feature on the ground that can be used as an orientation point or as a starting point for cardinal direction to the target area. Usually given as grid coordinates.

(11) Remarks. As much as possible, describe the activity, the characteristic features, and the processes used. Evaluate their importance. Identify structures or areas that may be vital. Take additional photographs to show detail or special features. State the relationship of these with the subject in terms of distance, direction, and use.

(12) Classification. On the bottom of each page, mark an appropriate security classification. The minimum is "confidential", except in training, which is "unclassified".

b. Annotations. When you look at the photograph of the subject, you may feel that certain features should be emphasized. If so, simply make necessary notes on the photograph. For instance, you may mark the azimuth in degrees at the top center of the photograph (fig 2-12) and provide additional information about the features on the back of the photograph. You must remember that the print is part of an intelligence report so annotate it carefully so you don't obscure important details.

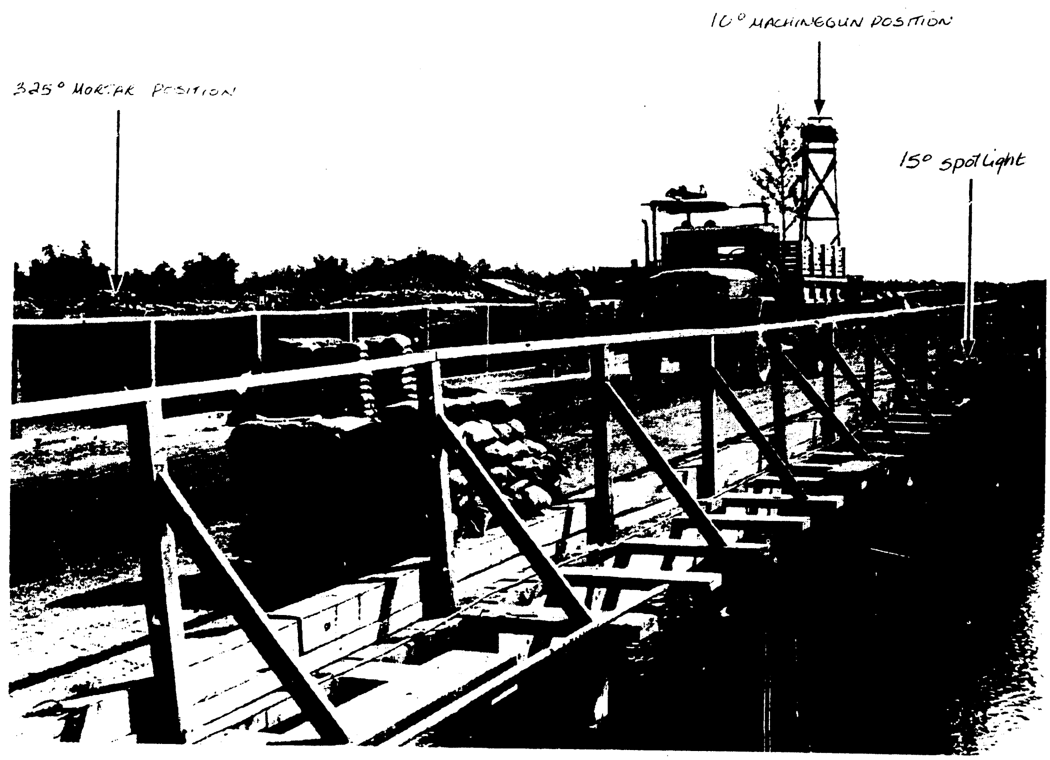


Fig 2-12. Annotated photograph.

Now that we have discussed the photo log and photo data sheet, what is the purpose of the photo log?

If you wrote, "To help the photographer process data after the mission," you're correct.

Lesson Summary. During this lesson you learned the characteristics of ground photography, and how to complete a photo log and photo data sheet. The next lesson will discuss field sketching.

Lesson 3. FIELD SKETCHING

LEARNING OBJECTIVES

1. Select the appropriate type of sketch to use for a specific mission.

2. Select the purpose for using a sketching sheet.

3. Select the scale used when drawing a panoramic sketch.

4. Identify the proper sequence of steps to follow when placing information on a panoramic sketch.

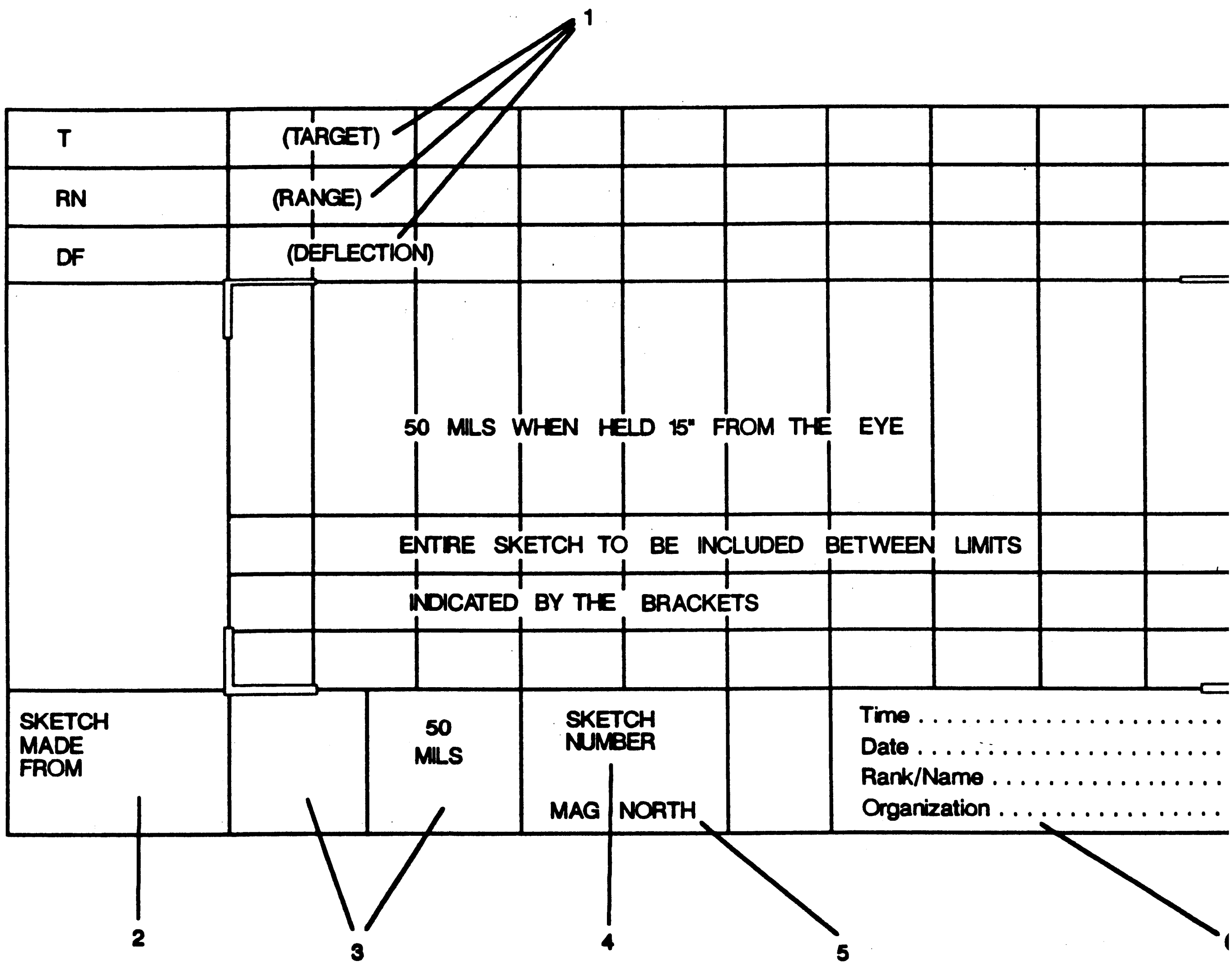
5. State the two factors that determine the scale of a military sketch.

Imagine that you are on a reconnaissance mission to photograph an enemy ammo compound. However, during your insertion by rubber craft, one of the boats capsizes and your camera is lost at sea. How will you accomplish the task? Your only tools to accomplish your mission are a small pad and pencil. When photographs cannot be taken, the simple method of field sketching can be used for obtaining information such as location, orientation, and measurement.

During this lesson you will cover the sketching sheet which is a tool to help in the construction of an accurate sketch, and the two types of sketches. The first, the panoramic sketch, is drawn while remaining at one observation point. The second, the military sketch, illustrates an overhead view of the area. We will also discuss how to determine which type of sketch is appropriate to accomplish a specific task.

2301. The Sketching Sheet

a. Definition. The sketching sheet provides space for recording necessary data to help you construct an accurate sketch in a systematic, uniform manner (fig 2-13). The sketching sheet provides vertical guidelines spaced 3/4 inch apart for indicating horizontal measurements. When the sheet is held 15 inches from the eye, each 3/4 inch space is 50 mils wide. Since there are nine of these spaces on the sheet, a sector of terrain 450 mils wide can be covered on one sketching sheet. Although the sketching sheet is both a useful and convenient aid to the sketcher, it is not necessary. A perfectly satisfactory sketch can be made on a message blank or on any other sheet of paper.



(1) Target Information
(2) Location Data
(3) Scale
(4) Sketch Number
(5) North Arrow
(6) Remarks

Fig 2-13. Sketching sheet.

b. <u>Components of the sheet</u>. Let's take a closer look at the sketching sheet by examining the explanation of each numbered section of the sheet on the following page.

(1) Target information.

(a) Target block. Name(s) of major targets drawn on the sketch.

(b) Range block. Range in meters from the observation post (OP) to the target.

(c) Deflection block. The angle of horizontal deflection in mils from the reference point to the target.

Note: This information is centered on the top three lines above the target with a straight line extending down to the target with an arrowhead.

(2) Location data

(a) Location of sketcher. An eight digit grid coordinate of the OP.

(b) Grid. A six or eight digit grid coordinate of the target area.

(3) Scale. Normally fixed at 3/4 of an inch which equals 50 mils.

(4) Sketch number. Number of your sketches. For example, # 1 of 3.

(5) North arrow. Draw an arrow drawn to magnetic North from the relative direction of the sketch.

(6) Remarks. Provide the following information:

(a) Time - time that sketch was started

(b) Date - date that sketch was made

(c) Name - rank, last name, and initials of sketchman

(d) Unit - unit designation of sketchman

c. Guidelines. The upper 1/3 of the sketching area (parallel vertical lines) is used for drawing the skyline. The lowest portion of the skyline will be represented by touching the top horizontal line. The lower 2/3 of the sketch area (grid pattern) is the actual sketching area of the target area. The horizontal and vertical guidelines are 3/4 inches apart and represent 50 mils. Deflections/depth measurements taken of the target area can be accurately transposed on the sketch using these lines.

2302. The Panoramic Sketch

a. Definition. The panoramic sketch is a pictorial representation of the terrain. It shows elevation and perspective as seen from one point of observation. The panoramic sketch shows the horizon, which is always of military importance, and intervening features such as crests, woods, roads, structures, and fences. An excellent means of target designation, the panoramic sketch may be used quite effectively by reconnaissance teams on patrol or in a static observation post or radio relay. If your team has TIME RESTRAINTS, the panoramic sketch offers the advantage of requiring very little time to complete. However, the disadvantage of the panoramic sketch is that it shows only one point of view.

b. Construction of a panoramic sketch. Now that we have described the panoramic sketch and how it is used, let's discuss its construction. The seven steps in the construction of a panoramic sketch are: study the terrain; select a reference point; fill in marginal data; sketch skyline; draw terrain features; draw major target features; and add vegetation. Detailed discussion of these steps follows.

(1) Study the terrain and scale size. Before beginning your sketch, carefully study the terrain so that you can distinguish the various crestlines and their proper relationship to one another. Also study the map at the same time you are studying the terrain. You may use field glasses or the M-49 observation scope (fig 2-14) to observe small details. The scale used when drawing a panoramic sketch is simple -- draw the objects in proper proportion to each other.

Fig 2-14. M-49 observation scope.

(2) Select a reference point and reference line. Select a conspicuous and permanent reference point in the sector to be sketched, preferably not closer than 500 meters. Holding the pad in a vertical plane at 15 inches from the eye, place it so that the upper corners are approximately in line with the limits of the sector. Then looking at the reference point, move the pad slightly so that the nearest vertical guideline coincides with the reference point. Mark this line with a heavy arrowhead at the top and with a zero in the space for deflection. It now becomes the reference line for all horizontal measurements in the sketch.

(3) Marginal data. As soon as you have marked the reference line, fill in the data on the bottom of the sketch. Complete the scale, before proceeding with the sketch. Without this information the finest sketch is useless, while with it, every line added to the sketch increases its military value. If the sketcher is interrupted or becomes a casualty before completing his work, the sketch may still be properly understood.

(4) Sketch the skyline. The skyline is the vertical control reference line. Sketch it so that the lowest portion of the skyline touches the top horizontal guideline on the sketch sheet. Take all vertical measurements from the lowest portion of the skyline and record them on the sketch, using the top horizontal guideline as a measuring tool.

(5) Draw terrain features. Draw in main terrain features such as roads, trails, crests, draws, and folds in the land. This will provide a framework for the remainder of the sketch. Compare and correct as needed.

(6) Draw major target features. Locate the target features and place and them on the sketch sheet. Reference each target horizontally from the reference point using the reference line. Also reference each target vertically from the skyline using the top guideline. After drawing each target, draw a line with an arrow from the target block to the target, then complete the targeting information. Do not overcrowd the sketch with needless detail. Include those items which are needed to provide orientation to the specific target area. Two methods for locating target features are described below. Keep in mind that none of these methods alone will work all the time. You may find it necessary to use a combination of the two.

(a) To use method 1, hold the pad about 15 inches from your eyes and slightly below the horizon. Sketch in the skyline and prominent features very lightly at the top of the pad. Then transfer this skyline to the proper place in the sketch. The lowest point of the skyline should touch the top-most of the faint horizontal guidelines (fig 2-15).

(b) To use method 2, hold the pad as described for method 1 and mark the top of the pad directly on line with a number of prominent features. Then draw light lines downward across the sketching space from the points thus obtained. These lines will serve to locate the corresponding features on the sketch (fig 2-15).

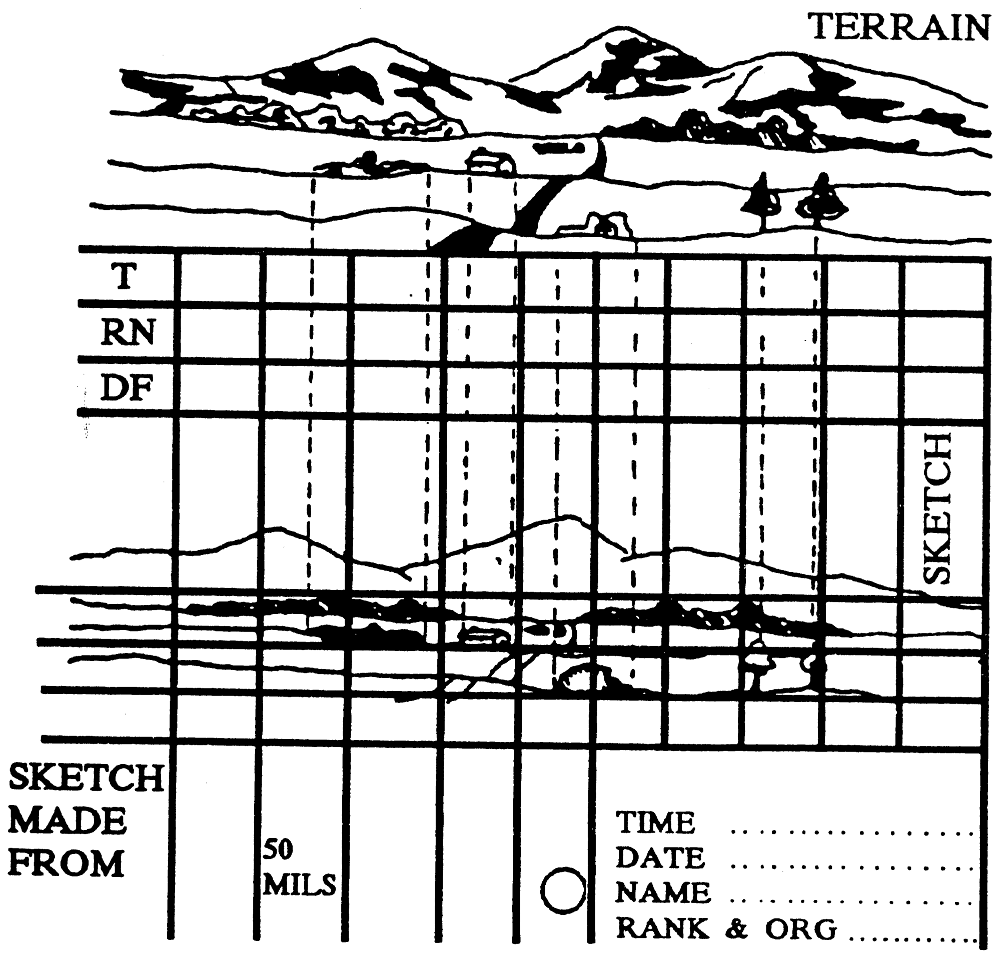


Fig 2-15. Location of features using a combination of methods 1 and 2.

(7) Add vegetation. Shade in the areas and add main vegetation clumps to finish the sketch. Add just enough to make a statement, but do not go overboard. Figure 2-16 illustrates a completed panoramic sketch.

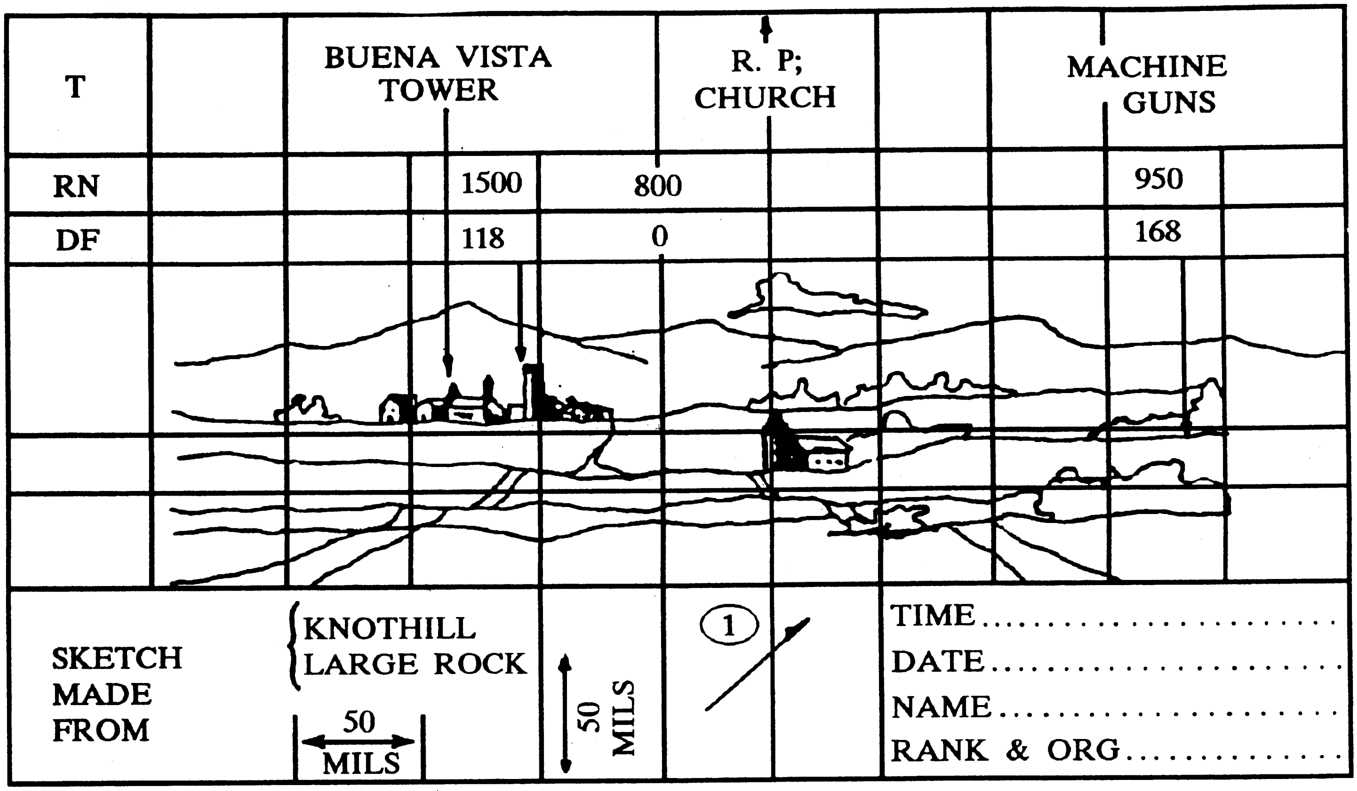


Fig 2-16. Completed panoramic sketch.

If you want to be efficient in the area of sketching, you must continuously practice the rules and guidelines outlined here. In addition, you must practice self-criticism. Examine your photography and sketching critically to determine whether they provide sufficient intelligence coverage. Remember that it must provide factual information to someone who will not have had the benefit of personal observation of the subject.

2303. Military Sketches

a. Definition. Military sketches show an overhead view of the subject. No portion of the area sketched is hidden from the viewer. Since Marines are familiar with military maps, interpreting the sketch poses no problem if it is drawn to a suitable scale and all non-standard symbols are explained in a legend.

b. <u>Advantages and disadvantages</u>. Military sketches are easily transferrable to hydrographic charts but panoramic sketches are not. If the assault boat coxswain uses a military sketch, he must keep in mind that the panoramic sketch will show the beach and hinterland as they would appear from the sea while the military sketch will show only an overhead view of these areas.

c. <u>Referencing</u>. Every detail that is included on the sketch must be referenced to a permanent map or chart feature by distance and azimuth. The reference point is predetermined from an existing map or chart of the area to be sketched. All the inclusions on the sketch will be measured to their exact width and height. Listed below are three methods of measuring.

(1) Physically measure the target (the least desired method).

(2) Compare the target with an object of known size, such as a man or vehicle.

(3) Use the mil relation formulas:

(a) One mil equals one meter at 1000 meters

(b) The WERM formula, <u>W</u>idth <u>E</u>quals <u>R</u>ange times <u>M</u>ils

(c) The WORM formula, Range equals <u>W</u>idth <u>O</u>ver Range times <u>M</u>ils.

Figure 2-17 illustrates a military sketch. Now let's take a closer look at the details and how this sketch is constructed.

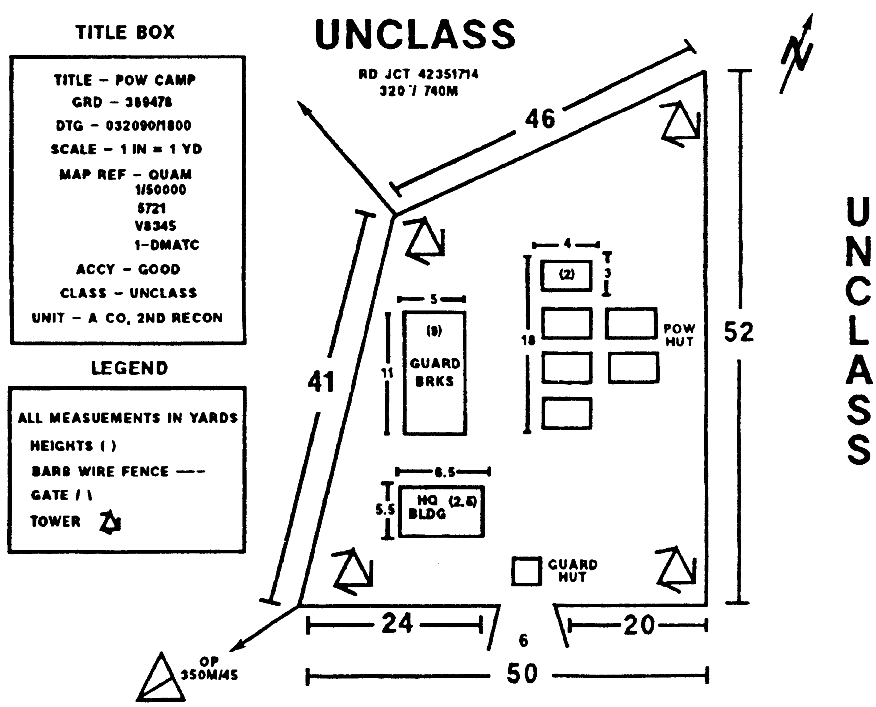


Fig 2-17. Military sketch.

d. <u>Construction of a military sketch</u>. Military sketches are not difficult to draw if you follow a few simple guidelines. Do not confuse simplicity (which is how the sketch is drawn) with complexity. On a military sketch, <u>ALL</u> letters and numbers are written in block letters. Listed below are the steps to follow to complete a military sketch.

(1) <u>Study the terrain</u>. Begin construction of the military sketch as you did for the panoramic sketch, study the crestlines and their proper relationships. Be sure to check maps.

(2) <u>Determine the scale</u>. Scale is governed by the size of the area to be sketched and the size of the sketching materials on hand. Suitable scales are:

1:360 1 inch = 10 yards/meters
1:900 1 inch = 25 yards/meters
1:1800 1 inch = 50 yards/meters
1:2700 1 inch = 75 yards/meters
1:3600 1 inch = 100 yards/meters

Avoid scales that will overcrowd the sketch. Ten by ten graph paper has a grid pattern of one-inch blocks subdivided into one-tenth inch blocks. Use this paper to aid in accurate measurements.

(3) <u>Draw in the title box</u>.

(a) Write title/subject of the sketch and its location (grid coordinates).

(b) Indicate the date time group.

(c) Identify the scale used, and the contour interval used.

(d) Write in the map reference (name, scale, sheet, series, and edition).

(e) Rate the accuracy of the sketch (poor, fair, good, or excellent).

(f) Indicate the classification of the sketch. The minimum is confidential. (Training is unclassified.) The classification should be labeled at the title box, top, and side of the sketch.

(g) Write the name and unit of the sketcher.

(h) Box-in the title box and label it "TITLE BOX".

(4) Draw the legend box.

(a) Indicate the unit of measurement used (e.g., feet, yards, meters).

(b) Provide all nonstandard military symbols used in the sketch.

(c) Semi-box/box-in the legend box. Fill in while sketching.

(d) Identify legend.

(5) Draw the outside border. Measure the outside borders of the target and symmetrically place on the graph paper.

(6) Draw features. For each object in the sketch, determine the size of the object and how far it is from the other objects. Place the objects on the sketch. Remember to count the number of blocks on the sketch sheet to determine the scale.

(a) Draw in the north-seeking arrow.

(b) Draw an arrow in the direction of the reference point. Indicate what it is, its grid, direction, and distance.

(c) Mark the observation post on the sketch.

If the sketch is used in conjunction with a hydrographic survey, include beach exits, survey base lines, and gradient information. As your last step ensure you evaluate and check for accuracy. A completed sketch, shown in figure 2-18, illustrates a military sketch drawn on ten by ten (10x10) graph paper. It has a grid pattern that facilitates the scales mentioned and is easily transferred to hydrographic cartography.

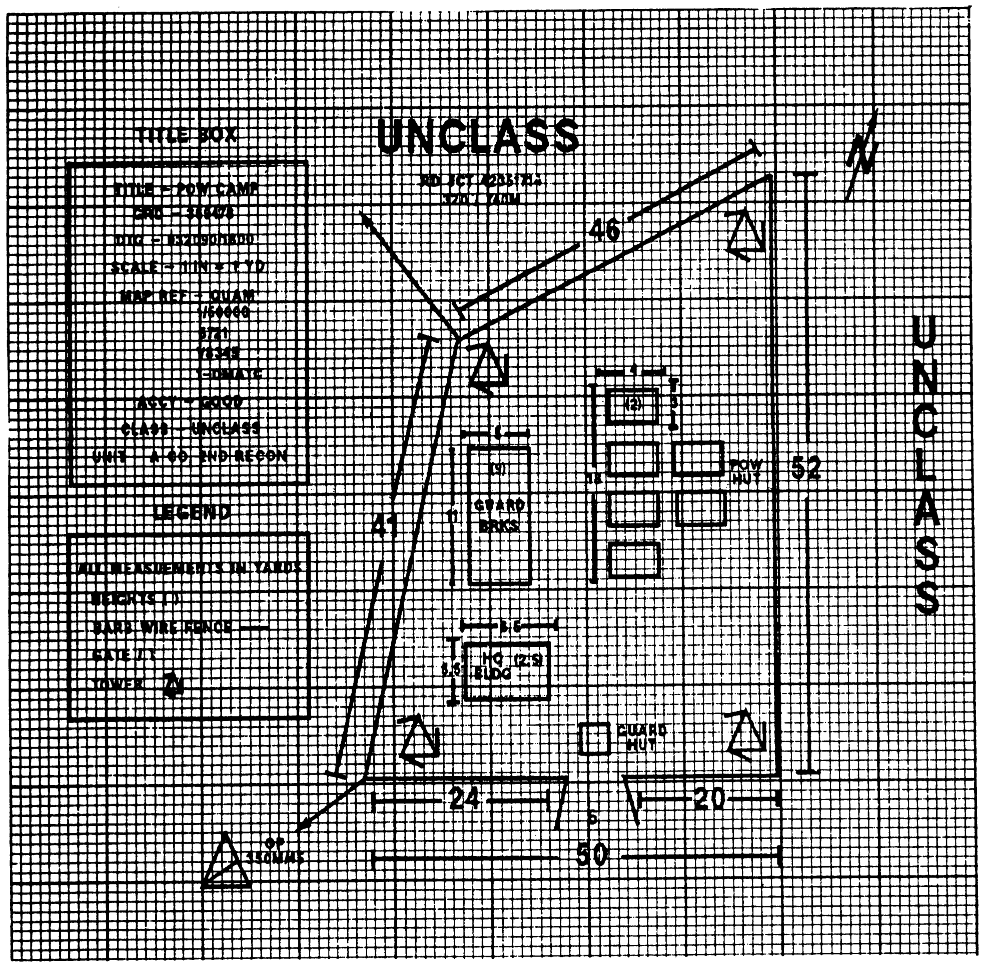


Fig 2-18. Military sketch on graph paper.

Now that we have covered the sketch sheet, panoramic sketch, and the military sketch, let's review. What two factors determine **the scale of a military sketch?**

(1) ____.

(2) ____.

The correct answers are: the size of the area to be sketched and **the size of** the sketching materials (graph paper) you have on **hand.**

Unit Exercise: Complete items 1 through 27 by performing the action required. Check your responses against those listed at the end of this study unit.

Matching: For items 1 through 4, match each camera term in column 1 with its appropriate definition in column 2. Selections in column 2 cannot be used more than once.

Column 1	Column 2
Camera terminology	Definition
____1. Shutter speed	a. Combination of ISO shutter speed, and f-stop setting
____2. Aperture	b. A mechanical device that opens and shuts the lens aperture of a camera
____3. Exposure control	c. An adjustable opening in an optical instrument that limits the amount of light that pass through the lens
____4. Depth of field	d. The zone that extends from in front of the subject to behind the subject, that appears to be in focus
	e. Used for mounting a strobe or socket

Matching: For items 5 through 10, match the nomenclature in column 1 with the correctly labeled part in the illustration.

Column 1

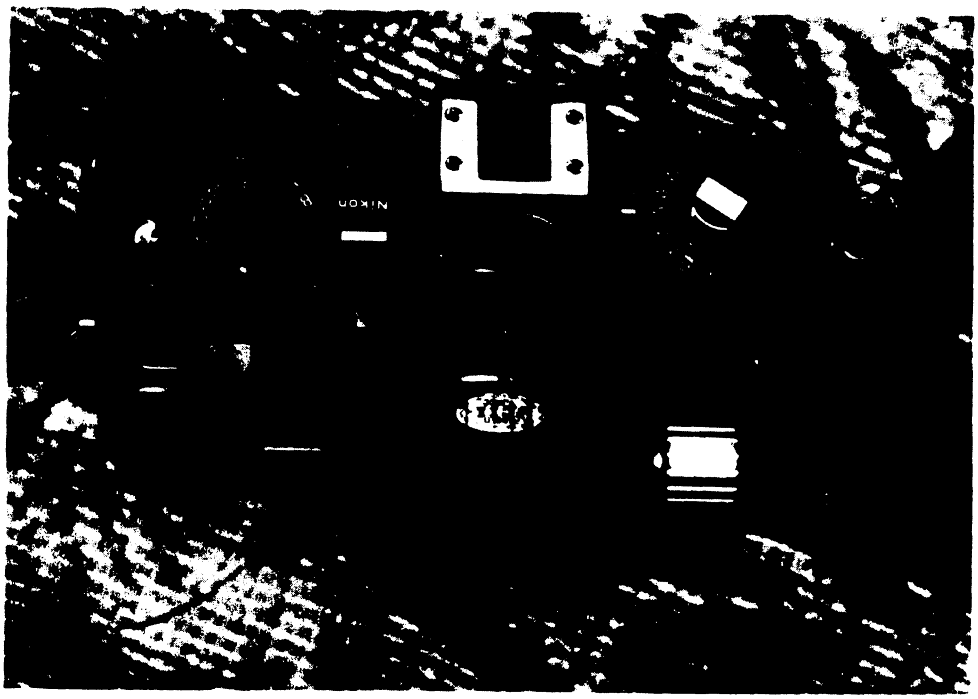
____5. Frame counter
____6. Film rewind crank
____7. Shutter release button
____8. Film advance lever
____9. Shutter speed and mode selector dial
____10. ASA/ISO film speed dial

A

B

C

F



E

D

11. Identify the proper sequence of steps to follow when preparing a Nikonos V camera for operation.

(1) Load film
(2) Mount lens
(3) Install batteries
(4) Check battery power

a. 3,2,4,1
b. 3,2,1,4
c. 3,4,2,1
d. 2,3,4,1

12. Your recon team is on a mission to perform a beach reconnaissance and photograph an ammo supply point two kilometers north of the beach. You have completed the beach recon and have reached a point where you cannot get any closer to the second objective without running the risk of compromising your patrol. You're fairly inexperienced at photography, but have a basic understanding of it. After you have set your f-stop setting, what is the best exposure setting for this photograph?

a. manual
b. M90
c. automatic
d. bulb

13. From the scrambled list of steps below, select the proper sequence to unload the Nikonos V camera.

(1) Lift up the film rewind knob and rotate it in the direction of the arrow to secure it.
(2) Open the camera back and remove the film.
(3) Fold out the rewind crank and rotate it in the direction of the arrow and continue to rewind until you feel the tension.
(4) Set the shutter and speed mode selector dial to R.
(5) Close and lock camera back.
(6) Place film in an airtight covering or in the original container.

a. 4,1,6,5,3,2
b. 4,1,3,6,2,5
c. 4,1,3,2,6,5
d. 4,1,3,2,5,6

14. List the three types of photographic views required to provide satisfactory ground photography.

1.______________________________

2.______________________________

3.______________________________

15. You are on a reconnaissance mission to photograph a bridge. Upon reaching your objective you realize your team cannot get closer to the objective due to the risk of being compromised. Your view of the objective is very distant. To get the best possible photograph you would

    a. move to an unobstructed view, focus at infinity, and take several, carefully exposed, overlapping views.

    b. move to an unobstructed view, focus at the center, and take one, carefully exposed photograph.

    c. move to an unobstructed view, focus at infinity, and take several photos of the center portion.

    d. move to an unobstructed view, focus at the ends of the object, and take two, carefully exposed photographs.

16. What is the purpose for maintaining a photo log?

    a. Allows the photographer to provides adequate and accurate data, which the interpreter can later use to provide intelligence.

    b. Keep track of the amount of film used, assist in the construction of the panoramic sketch, and aid in filling out the photo data sheet.

    c. Assist the photographer in processing data during the mission, locate the object for an air strike, and assist in completing the photo data sheet.

    d. Keep track of the amount of film used, assist in constructing the military sketch, and help make photo annotations and overlays.

Matching: For items 17 through 22, complete the photo data sheet by matching the lettered item on the illustration below with its correct information in Column 1.

Column 1

Photo Data Sheet information

____17. Cape Code 1;50,000 sheet 56471 Series V734 Ed 3-DMATC
____18. Located 300 meters SW of road intersection
____19. Ammo locker located in ARS compound
____20. Two separate ammo lockers painted green 12'x4'x4'; located on top of a cement slab and don't appear secured to it; both lockers locked with a padlock
____21. Nicaragua
____22. Tri-x 400

PHOTO DATA SHEET

Type of Camera ____________ Focal Length ________

Film size/ Type a. ______________ Roll No _____ Exp No _____

Time ____________ Date ______________

Other Data _________________________

____

Camera Azimuth

Nation/Country b.	Provence/State	City/Town	Other

Coordinates	Map Reference f.

Name of Activity d.

Reference Point e.

Remarks

c.

(OVER IF REQUIRED)

Photographer: ________________________________

Unit: ____

UNCLASSIFIED

Classification

23. Your reconnaissance team is conducting a rubber boat helicast 15 miles offshore an enemy beach. Your team's mission is to conduct a hydrographic survey of the beach and photograph an enemy compound. Once finished, your team will move back to the beach for extraction. During the waterborne movement, a large wave hits your team and capsizes the rubber craft, causing loss or damage to some of the equipment. Part of the gear lost was the team's only camera. Although the team does not have much time to complete the mission, your team leader is determined to finish both tasks. Instead of photographing the site, you will sketch it. Due to the time restraints and lack of equipment, which type of sketch would be appropriate to accomplish the mission?

a. Military
b. Picture
c. Data
d. Panoramic

24. Select the purpose for using a sketch sheet.

a. The sketch sheet is a tool, used to help in the construction of an accurate sketch. It provides enough space for 450 mils of data.

b. The sketch sheet is a tool, used to help fill in information for the Photo Data Sheet. It provides enough space for 200 mils of data.

c. The sketch sheet measures deflection in mils from a reference point to target features. It provides enough space for 100 mils of data.

d. The sketch sheet is a tool, used to help pinpoint targets for air strikes. It provides enough space for 450 mils of data.

25. State the two factors that determine the scale of a military sketch.

1. ______________________________

2. ______________________________

26. Select the appropriate scale to use when drawing a panoramic sketch.

a. Objects are drawn in proper proportion to each other.
b. Ten by ten graph paper provides the scale size needed.
c. The size of available sketching material determines scale.
d. Scale will be determined after the sketch is turned in.

27. Identify the proper sequence of steps to follow when placing information on a panoramic sketch.

(1) Draw major target features
(2) Sketch skyline
(3) Draw terrain features
(4) Add vegetation
(5) Select reference point
(6) Study the terrain
(7) Fill in marginal data

a. 6,5,7,2,3,4,1
b. 6,5,7,4,1,3,2
c. 6,5,7,2,3,1,4
d. 6,5,7,3,2,4,1

UNIT SUMMARY

There are many tasks that recon Marines are expected to perform. Study Unit 2 covered the use of the Nikonos V camera, photo data sheet, photo log and the two types of field sketches. As you can see, reconnaissance Marines are not expected to retain all the information gained from their missions to memory. You will see in the following study units that there are many tools used by recon Marines to help in the accomplishment of the missions. In study unit 3 we will cover reconnaissance communications.

Study Unit 2 Exercise Solutions

		Reference
1.	b.	2101e
2.	c.	2101d
3.	a.	2101g
4.	d.	2101f
5.	b.	2102 (7)
6.	e.	2102 (3)
7.	f.	2102 (6)
8.	a.	2102 (4)
9.	c.	2102 (1)
10.	d.	2102 (2)
11.	b.	2103
12.	c.	2104b
13.	c.	2105
14.	Distant view Medium view Closeup	2202b
15.	a.	2204a
16.	a.	2205a
17.	f.	2206a
18.	e.	
19.	d.	
20.	c.	
21.	b.	
22.	a.	
23.	d.	2302a
24.	a.	2301a
25.	The size of the area to be sketched. The size of available sketching material.	2303d(2)
26.	a.	2302b(1)
27.	c.	2302b

STUDY UNIT 3

RECONNAISSANCE COMMUNICATIONS

Introduction. There was a time in history when a commander of an army could position himself in a secure location that allowed him to observe the entire battle as it unfolded before him. He could influence the battle by sounding a horn or sending a speedy messenger to control the fighting and the positions of his men. Today, a commander may find himself sitting in front of a large map which shows both the locations of his reconnaissance unit and what they're up against. All the tactical information on his map, usually provided by radio, is provided by his unit's reconnaissance in the field (fig 3-1). Effective military communication requires speed, security, reliability, and flexibility. Being able to use communications equipment to report enemy activity or to call supporting arms may be the determining factor in the fast arena of the modern battlefield. This study unit will cover techniques to enhance your communication capability, basic communications equipment,and field expedient antennas.

Fig 3-1. Field communicator.

Lesson 1. COMMUNICATIONS GUIDELINES

LEARNING OBJECTIVES

1. State the two important factors that you should consider when positioning your communications equipment.

2. Select the appropriate course of action to enhance your radio communications capabilities.

3. List the three ways to avoid detection during radio communication.

3101. Establishing Communications

You are on a reconnaissance mission to collect information on an enemy ammo compound. After establishing your observation post, you find that communicating with headquarters has become very difficult to maintain because of the distance and terrain. How are you going to correct this problem? As you study this lesson, you will learn techniques to enhance the transmitting and receiving capabilities of your radio.

a. Positioning communications equipment. Optimum communications and the ability to camouflage your communications equipment are two factors which play an important role in positioning your equipment. Unfortunately, you will seldom be able to position your equipment so that you can communicate well and yet be hidden from enemy observation, enemy fire, or enemy direction finding equipment. The ideal location for a radio antenna is as far away from cover as possible. A suitable location would be a mountain-top or out in the middle of a large field. However, this location does not always agree with the commander's requirement for his troops and equipment to be hidden from observation. Therefore, plan the location of equipment in detail to achieve the best results.

b. Enhancing communications capabilities. Obstacles such as trees, buildings, and hills between a transmitter and receiver will weaken the signal or stop it altogether. Aircraft flying along the path will also interfere with your reception. Listed below are the correct measures to enhance your radio communications capabilities.

(1) Ensure all connecting parts have had preventive maintenance performed (PM).

(2) Position your antenna as high as you can to overcome obstacles, especially if you are communicating in the direction of trees or buildings.

(3) Keep your radio as far back as possible from obstacles, which are in the direction of your transmission, to prevent interference or damage to your equipment.

(4) Avoid all electrical power sources and large metal objects.

Now that we have covered the guidelines of communications, let's review. What are the two important factors you should consider when positioning your communications equipment?

(1) ____

(2) ____

If you listed optimum communications and camouflage your communications equipment, you are correct.

c. Avoiding detection. Nothing is more obvious than an antenna protruding from a tree line. Remember that it doesn't take much intelligence for the enemy to realize where you are located. Listed below this page are ways to avoid detection.

(1) Camouflage. Cover the wire or antenna with foliage or manmade material.

(2) Terrain shielding. Direct your transmission or message in one direction away from the enemy (fig 3-2). Try to put some terrain between you and the enemy. This way he can't easily intercept your communications or jam your circuit.

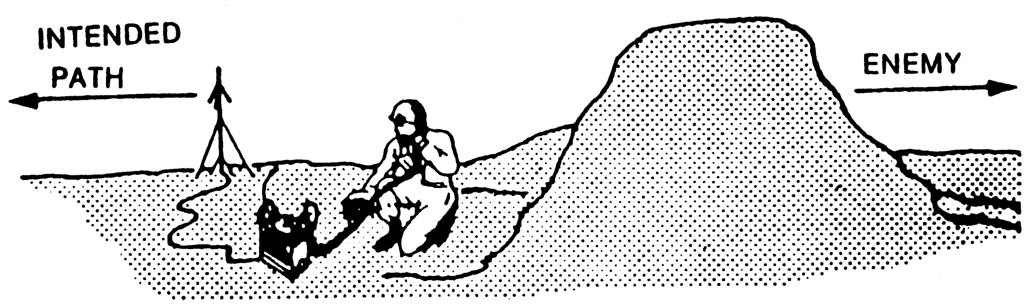


Fig 3-2. Terrain shielding.

(3) Hillside to hillside. Instead of communicating on top of hills or along the valley floor, communicate from hillside to hillside. This method of communication makes it harder for the enemy to locate your unit.

Before learning about the AN/PRC-104 radio, let's review. List the four courses of action you would take to enhance your radio communications capabilities.

(1) ____________________

(2) ____________________

(3) ____________________

(4) ____________________

The basic ways to enhance your communications are to ensure all connecting parts have had preventive maintenance performed, position your antenna as high as you can to overcome obstacles, keep your radio as far back as possible from obstacles, avoid all electrical power sources and large metal objects.

Lesson Summary. This lesson covered important factors to consider when positioning your communications equipment and ways to enhance your radio capabilities through appropriate courses of action. In the next lesson, you will cover the AN/PRC-104 radio.

Lesson 2. THE AN/PRC-104 RADIO

LEARNING OBJECTIVES

1. Identify the basic characteristics of the AN/PRC-104.

2. Identify the correct set-up procedures for the AN/PRC-104.

3201. General Characteristics

Marine reconnaissance units have the need for an extended communications operating range. One of the radios that the Marine Corps uses to accomplish this need is the AN/PRC-104 radio.

a. Characteristics. The AN/PRC-104 is a lightweight transmitter which operates in the HF (high frequency) and the upper part of the LF (low frequency) spectrums. Frequencies that you may use are 2.0 to 29.999 MHz (megahertz). This radio weighs 14 lbs with the battery. The AN/PRC-104 is water tight, submersible and capable of rough handling in a field environment. The AN/PRC-104 operates in the upper sideband (USB) and lower sideband (LSB) modes so that you can communicate using voice. Other functions are continuous wave (CW) for morse code, or frequency shift keying for transmission and reception of teletype data. Figure 3-3 illustrates the operating ranges with different antennas.

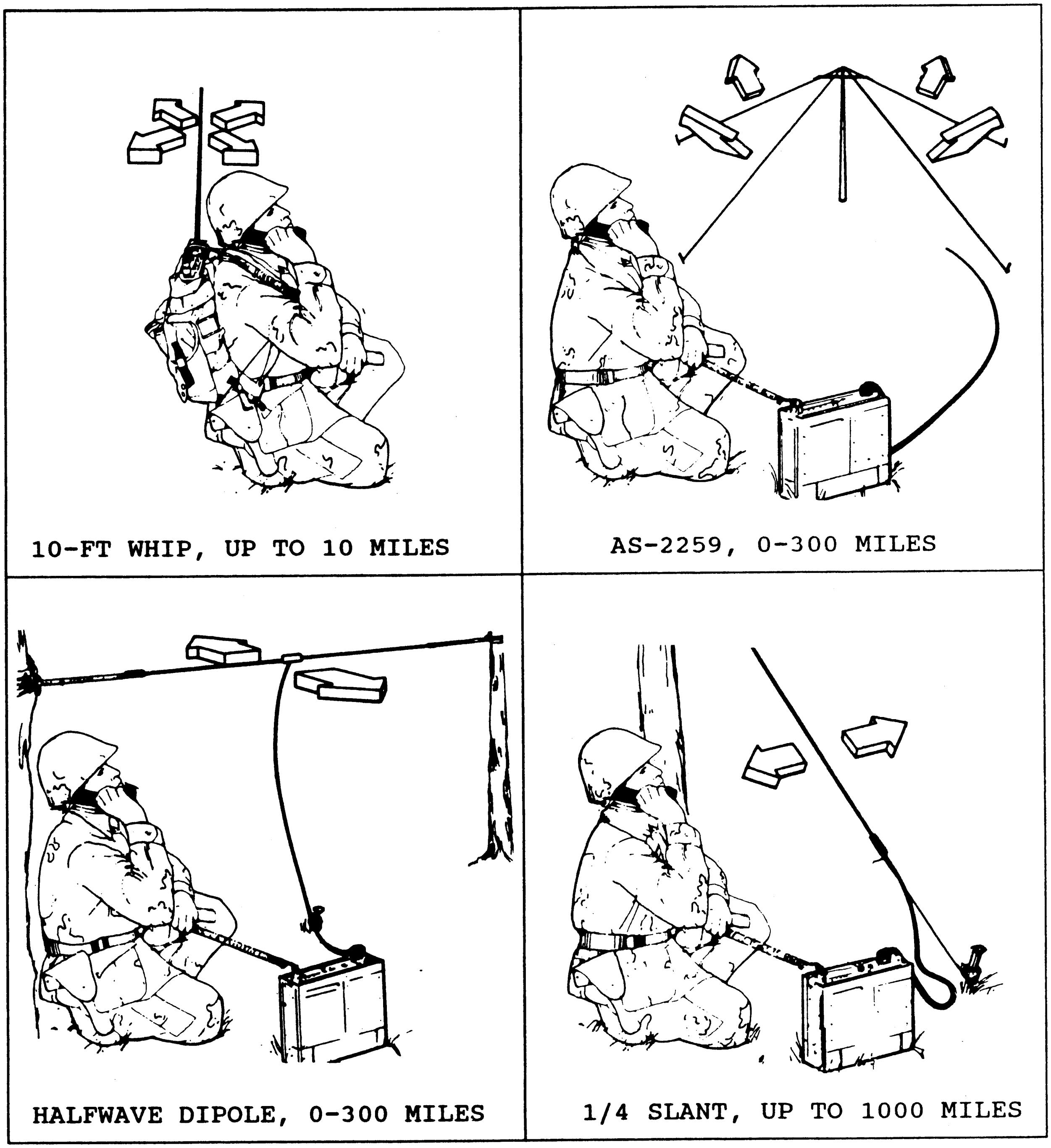


Fig 3-3. Operating ranges with different antennas.

b. Components. The components of the AN/PRC-104 radio and a description of each function are illustrated on the following page in figures 3-4 and 3-5.

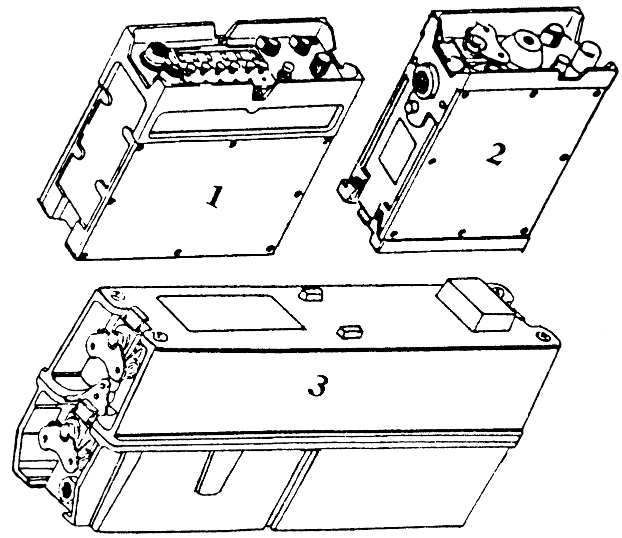


Fig 3-4. AN/PRC-104 components.

NAME OF COMPONENT	DESCRIPTION OF FUNCTION	REFERENCE NUMBER
Receiver transmitter RT-1209	The receiver transmitter RT-1209 contains the major electronic components and all operator controls.	1
Amplifier/ coupler AM-6874	The amplifier is a component that increases the strength of voltage to 20 watts. When used at that high of voltage, the enemy can detect your position much faster. Only key your handset 3 to 5 seconds to help avoid this. The coupler transfers the energy being amplified from one circuit to another.	2
Battery case/pack CY-7541	Two different types of batteries can be used in the AN/PRC-104. A pair of lithium sulfur dioxide batteries (BA-5590), or nickel cadmium (BA-590) batteries.	3

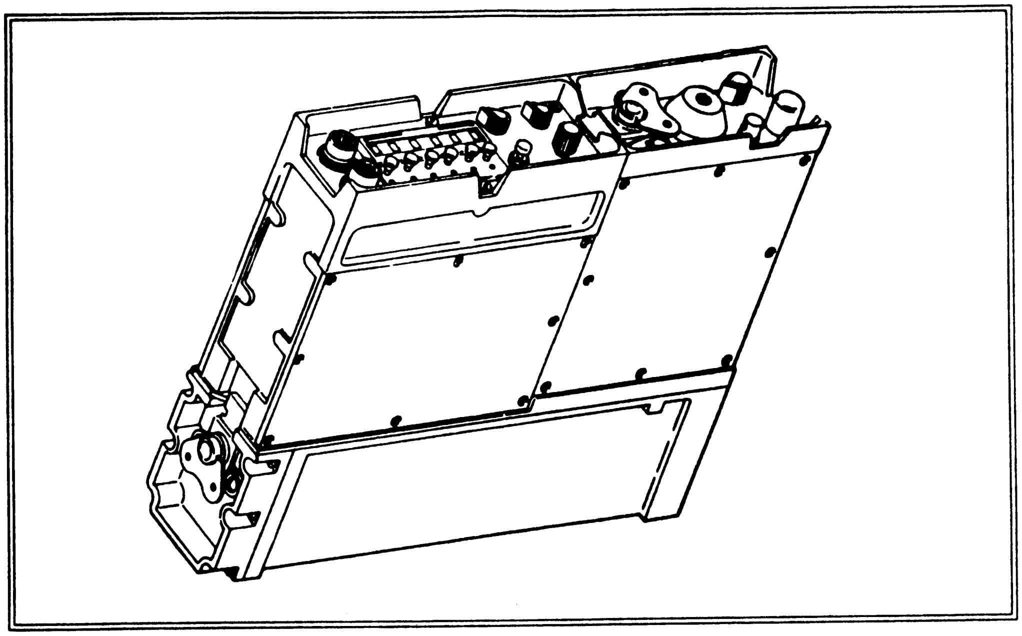


Fig 3-5. AN/PRC-104 components assembled.

c. <u>Set up-procedures</u>. Set-up procedures are used to make the radio operate, and to ensure that the radio works in the voice mode before switching to another mode. The steps and procedures to prepare the AN/PRC-104 are listed below.

STEP	PROCEDURE
1	Open the accessory/carrying case. To do this, depress the pressure valves on the side of the case which is located under the handles. Next, release the pressure.
2	Unfasten the case latches and remove the cover.
3	Remove the receiver transmitter-amplifier coupler combination from the carrying case. The receiver transmitter (RT) and amplifier always remain connected together in storage.
4	Ensure that the VOLUME OFF/MAX switch is in the OFF position.
5	Attach the power source. The batteries are never stored in the carrying case.

Now that we have covered the first five steps to set up the AN/PRC-104 radio, let's review. Without looking at the chart, list, in order, the first five set-up steps.

(1)______________________________

(2)______________________________

(3)______________________________

(4)______________________________

(5)______________________________

If you listed the procedures in the following order, you are correct: (1) open the accessory case, (2) unfasten the case latches and remove the cover, (3) remove the receiver transmitter-amplifier coupler combination from the carrying case, (4) ensure that the volume off/max switch is in the off position, and (5) attach the power source. Let's continue.

STEP	PROCEDURE
6	Attach the antenna shock mount with the whip antenna to the antenna socket.
7	Connect the handset to the AUDIO connector, set the MODE switch to V-TR, and set the ANTENNA SELECT switch to the WHIP position.
8	Set the frequency to 2.221.2 KHz.
9	Set the SIDE BAND SELECT switch to the USB. Next set the volume to your desired listening level.
10	Set the frequencies. a. Allow the set to warm-up for one minute. b. Press the handset's PUSH TO TALK BUTTON. The set should tune automatically. Note: If the radio does not tune, turn off the power for a moment and try again. c. Transmit a test count to another radio's frequency to the frequencies listed below: 1. 3,334.0 KHz 2. 6,665.6 KHz 3. 8,889.8 KHz 4. 15,554.5 KHz 5. 27,778.7 KHz

After you have checked that all frequencies are operating and all set-up procedures are complete, you are ready to establish your desired communications.

Now that we have covered the last five steps to set up the AN/PRC-104, let's review. List, in order, the last five steps when setting up the AN/PRC 104.

(6)____

(7)____

(8)____

(9)____

(10)____

The correct answers are as follows: (6) attach the antenna shock mount with the whip antenna, (7) connect the handset, (8) set the frequency to 2.221.1 KHz, (9) set the side band select switch to USB, and (10) set the frequencies.

d. <u>Operation</u>. Operating the AN/PRC-104, as with all HF radio communications, depends upon several factors. The reliability and effectiveness of radio communications in the HF frequency range depends upon the terrain around the transmitting site. Some of the other factors are time of day, distance between stations, atmospheric conditions, and the effects of the ionosphere on radio waves. You can control some of these factors by selecting the proper antenna or frequency.

e. <u>Antenna selection</u>. The operator can control some of the limiting factors by selecting the proper antenna. The field environment, tactical situation, and the proper range also help to select the proper antenna. If the radio is manpacked, there is only one antenna that you can use; the whip antenna. The whip antenna is mostly used for short ranges. The maximum operating range for this antenna is 10 miles. If the radio set is operated in a fixed location, you can use one of the following three antennas: a simple halfwave dipole, which is good from 0 to 300 miles; an AS-2259, which is good for the same ranges as the dipole; and the quarter wave slant antenna, which is good up to 1000 miles.

<u>Lesson Summary</u>. This lesson covered the basic characteristics of the AN/PRC-104 radio and its set-up procedures. In the next lesson, you will cover the AN/PRC-113.

Lesson 3. THE AN/PRC-113 RADIO

LEARNING OBJECTIVES

1. Identify the basic characteristics of the AN/PRC-113.

2. Identify the correct set-up procedures for the AN/PRC-113.

3301. General Characteristics

The AN/PRC-113 is another type of radio which reconnaissance Marines use to accomplish the mission. As with all equipment, this radio operates only as well as the operator is trained.

a. Characteristics. The AN/PRC-113 is a two band, lightweight radio with ground-to-ground, air-to-ground capabilities. The radio weighs 13 pounds with the battery. The two radio bands are very high frequency (VHF) for ground-to-ground use and ultra high frequency (UHF) for ground-to-air communications. The radio set is designed for short-range tactical use. The range of the AN/PRC-113 is line of site for ground-to-air communications; e.g., if an aircraft is in line of sight whether you see it or not you can communicate with the aircraft. Frequencies range from 116.000 to 149.975 MHz for VHF and from 225.000 to 399.975 MHz for UHF.

b. Components. The name of the components and a description of their function are provided in the chart below and on the following page.

PART NAME	DESCRIPTION OF FUNCTION	NUMBER
Receiver Transmitter (RT)	Contains the controls, indicators, and electronics to operate the radio set in the VHF/UHF tactical mode	1
Battery case	Houses the batteries	2
Handset	Provides audio UHF/VHF operations for ground-to-ground and ground-to-air communications	3
UHF antenna	Used during UHF operations for ground-to-air communications	4
VHF antenna	Used during VHF operations for ground-to-ground communications	5

PART NAME	DESCRIPTION OF FUNCTION	NUMBER
KY-57 base band cable assembly	Connects between the RT audio connector and the KY-57 unit during secure voice operation	6
Backpack	Used to carry the radio set and KY-57 unit	7

Figure 3-6 shows the components of the AN/PRC-113.

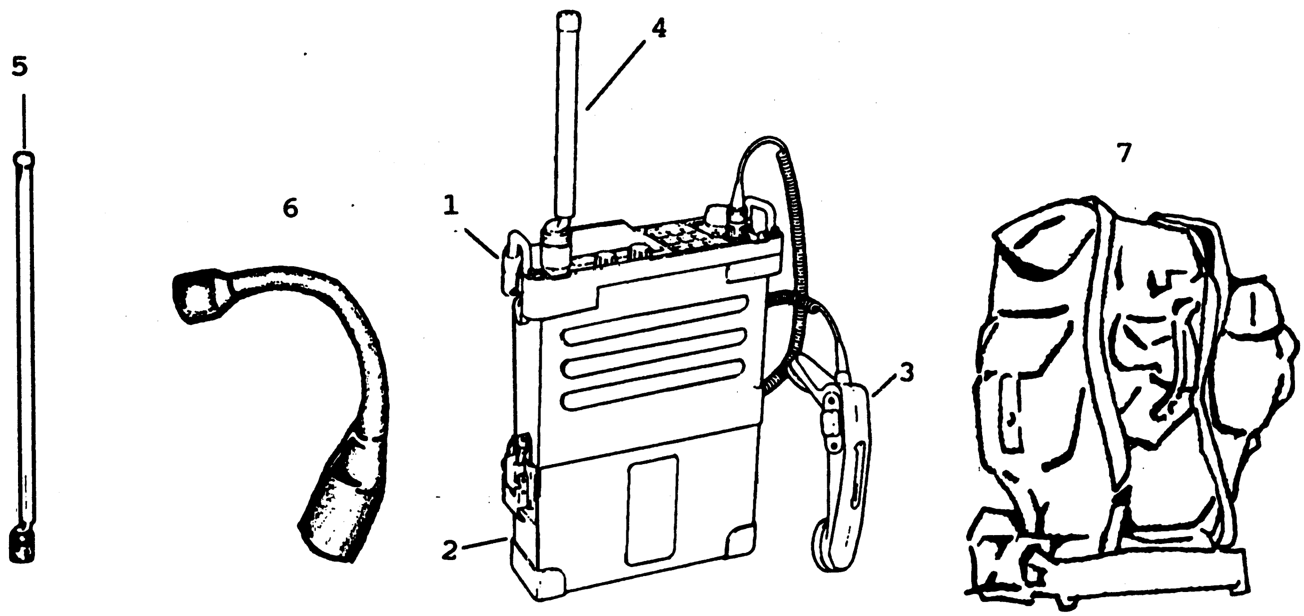


Fig 3-6. AN/PRC-113 components.

c. Set-up procedures. The set-up procedures for the AN/PRC-113 are listed below. With each step, there will be substeps to help you perform the main step.

STEP	PROCEDURE
1	Install the batteries. a. Place radio set down on handles. b. Release latches on battery case. c. Remove battery case. d. Install new batteries; mate with RT. e. Replace battery case on RT. f. Lock latches on battery case.
2	Connect the antenna. Choose the type of antenna, VHF or UHF, according to the mission.
3	Connect the handset.
4	Switch on the ON/VOL control knob by turning it clockwise. a. Ensure that the entire display is lit, which indicates that the LEDs are operational. b. Ensure that after a 4-second warm-up, the last frequency or preset frequency appears. Special operating modes, which were previously set, will also appear (e.g., GD, SQL, or LPR).
5	Adjust the dim control.

Now that you have covered the first five steps to set up the AN/PRC-113, let's review. Without looking back, list, in order, the first five steps to set up the AN/PRC-113.

(1)______________________________

(2)______________________________

(3)______________________________

(4)______________________________

(5)______________________________

The correct procedures to set up the AN/PRC-113 are as follows: (1) install the batteries, (2) connect the antenna, (3) connect the handset, (4) turn the on/off switch to the on position, and (5) adjust the dim control.

STEP	PROCEDURE
6	Observe the display decimal point. If the decimal point is blinking, replace the batteries.
7	Select the manual frequency. a. Select any frequency within one of the two possible bands, VHF or UHF. b. Observe that when the first number of the new frequency is selected and displayed, the remaining numbers of the display will go blank. Note: The selection of an invalid frequency or digit will cause that number to blink on the display. c. Press CLR to correct an error in selection.
8	Load the preset channels.
9	Select the mode of operation.
10	Transmit by operating the PUSH TO TALK switch on the handset.

Now that you have covered the set-up procedures for the AN/PRC-113, let's review. What are the last five set-up procedures for the AN/PRC-113?

(6)____

(7)____

(8)____

(9)____

(10)_______________________________________

The correct order for the last five steps are as follows: (6), observe the display decimal point, if blinking replace batteries; (7), select manual frequency; (8), load preset channels; (9), select mode of operation; and (10), transmit.

Lesson Summary. This lesson covered the AN/PRC-113 radio. As you can see, the reconnaissance Marine must understand and use equipment far beyond the M16A2 service rifle. In the next lesson, you will cover the AN/PRC-68.

Lesson 4. THE AN/PRC-68 RADIO

LEARNING OBJECTIVES

1. Identify the basic characteristics of the AN/PRC-68.

2. Identify the three main components of the AN/PRC-68.

3. Identify the correct operating procedures of the AN/PRC-68.

3401. General Characteristics

Before you can select a channel, the AN/PRC-68 must be preset by a radio technician. Up to ten channels can be preset at any given time. When you check out an AN/PRC-68 radio, you must ensure that your ten preset channels are adjusted to the frequencies you desire to use. You must verify that your preset channels match those of adjacent or friendly units.

a. Characteristics. The AN/PRC-68 is a VHF/FM radio which has an operating range of 300 yards to 1 mile. The radio weighs 46 ounces, less than 3 pounds, and can be carried in the utility jacket. The frequency range of the AN/PRC-68 is 30 to 79.95 MHz. This radio is compatible with other Marine Corps VHF equipment that use the same frequency range.

b. Radio channels. THe AN/PRC-68 has 1,000 available channels. This doesn't mean that you can select any one of the 1,000 available channels with just the flick of a knob like you can with other VHF radios. Only 10 preset channels are available to you at a time. These 10 channels must be adjusted by a technician. When you check out an AN/PRC-68 radio, you must ensure that your 10 preset channels are adjusted to the frequencies you desire to use. Remember, there are 1,000 channels available, and you can only preset 10 channels. Just because you have the AN/PRC-68 does not necessarily mean you can talk to any AN/PRC-68. You must verify that your preset channels match those of adjacent/friendly units.

c. Components. The components and functions of the AN/PRC-68 are listed below. Figure 3-7 shows the components of the AN/PRC-68.

PART NAME	DESCRIPTION OF FUNCTION	REFERENCE NUMBER
Receiver transmitter (RT)	The upper component is the RT which contains all the controls and connectors.	1
Battery box	The battery box holds the BA-1588 battery which is attached directly to the RT unit.	2
Short Antenna	Use to transmit radio waves.	3

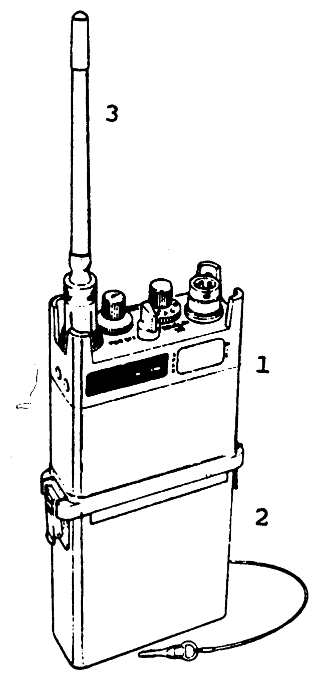


Fig 3-7. AN/PRC-68 radio components assembled.

d. Operating procedures. Figures 3-8 and 3-9 illustrate the controls and connectors of the radio. A handset can be attached to the audio connector if desired. For normal, short-range operation and usage, you would attach the short antenna to the antenna mount. For extended range, you would use the tape antenna connected in the same manner.

STEP	PROCEDURE
1	Turn the radio on. Turn the PWR/OFF/ON switch clockwise to the ON position until you hear a click.
2	Adjust the volume.
3	Activate the squelch. Place the PWR/OFF/ON switch in the squelch position.
4	Transmit. Push the TALK SWITCH and depress until you are done talking.
5	Turn the radio off. Turn the PWR/OFF/ON switch counterclockwise until you hear a click.

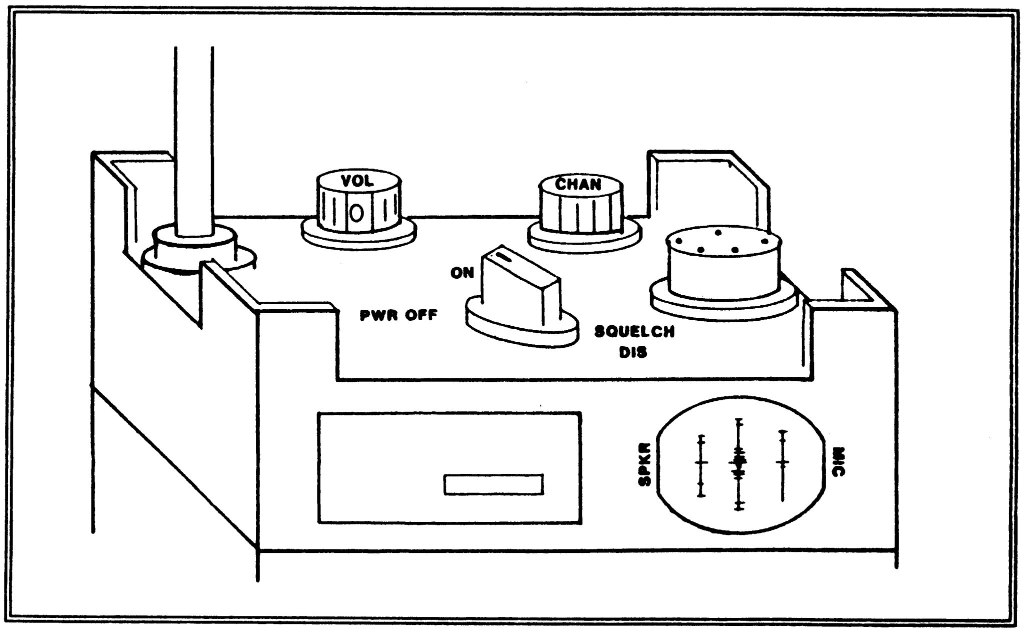


Fig 3-8. AN/PRC-68 top and front view.

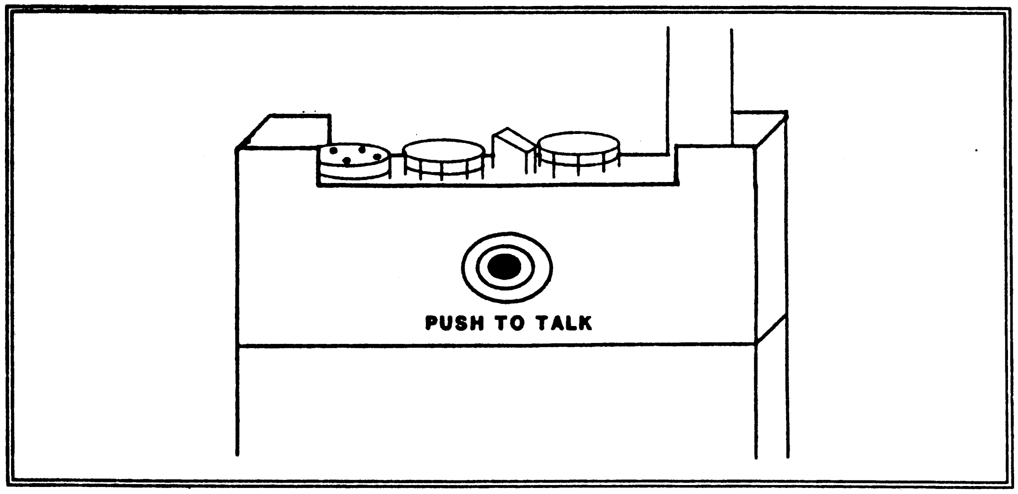


Fig 3-9. AN/PRC-68 back view.

How many channels can be preset on the AN/PRC-68 radio?

If you answered 10, you are correct.

Lesson Summary. This lesson covered the AN/PRC-68 radio. Because of its size, this radio is a versatile piece of communications equipment. While on patrol, the size of the radio allows the individual Marine to carry more equipment. In the next lesson we will cover the Marine Corps' newest communication system -- AN/PRC-119.

Lesson 5. THE AN/PRC-119 RADIO

LEARNING OBJECTIVES

1. Identify the basic characteristics of the AN/PRC-119.

2. Given a diagram of the components of the AN/PRC-119, correctly match the components to their appropriate name.

3501. General Characteristics

Currently, the Marine Corps' basic system of communications is the AN/PRC-77. The replacement for this radio is the AN/PRC-119 SINCGARS (single channel, ground, airborne, radio system). Compared to the AN/PRC-77, the SINCGARS has many new features. Compared to other radios covered in this study unit, except for the AN/PRC-68, it would take a complete MCI course to learn everything about the SINCGARS. Let's cover the basic characteristics of the SINCGARS system.

a. Characteristics. SINCGARS is a single channel, VHF/FM band radio. It is equipped with 2,320 channels you may use for transmission. It is operated by a silent push button digital tuner with visual electronic displays. This display provides quick checks for the channels during field operations. The radio is designed to hop from one frequency to another to help avoid enemy detection. The battery used to power this radio can operate for 18 to 20 hours, and it can handle secure traffic without attached equipment. The transmission power of the radio is listed below.

(1) Radio frequency switch on LO (low). The range is 0 to 300 meters.

(2) Radio frequency switch on ME (medium). The range is 3 to 4 kilometers.

(3) Radio frequency switch on HI (high). The range is 4 to 8 kilometers.

b. Operation modes. Different modes of operation and preset channel numbers are listed below.

OPERATION MODE	METHODS OF OPERATION
Single channel	Method of operation using one selected frequency. You can preset eight channels in this mode. Remember that using one channel defeats the purpose of SINCGARS. The radio is designed for frequency hopping which prevents the enemy from detecting your position.
Frequency hopping operation	Method of operation in which the circuit automatically changes frequencies rapidly. The radio can preset six channels in this mode.

3502. Components

Most manpacked radios have basically the same components and attached equipment. Figure 3-10 shows the components of the AN/PRC-119. Figure 3-11 shows a picture of the front panel of the radio.

NAME OF PART	DESCRIPTION OF FUNCTION	REFERENCE NUMBER
Manpack antenna	Radiates and receives net radio frequencies for the radio transmitter	1
Receiver Transmitter (RT)	Provides primary means of command and control with voice and digital data for the VHF-FM combat net radio	2
Handset	Used for voice communication	3
Battery box	Protects the battery	4
Battery	Supplies primary power for operation	5

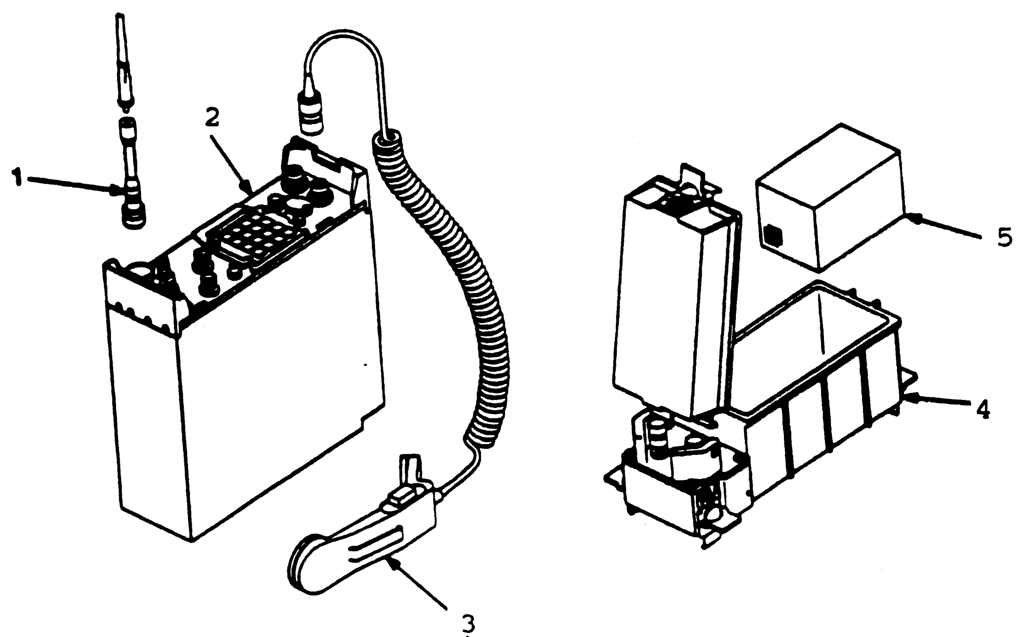


Fig 3-10. The AN/PRC-119 radio components.

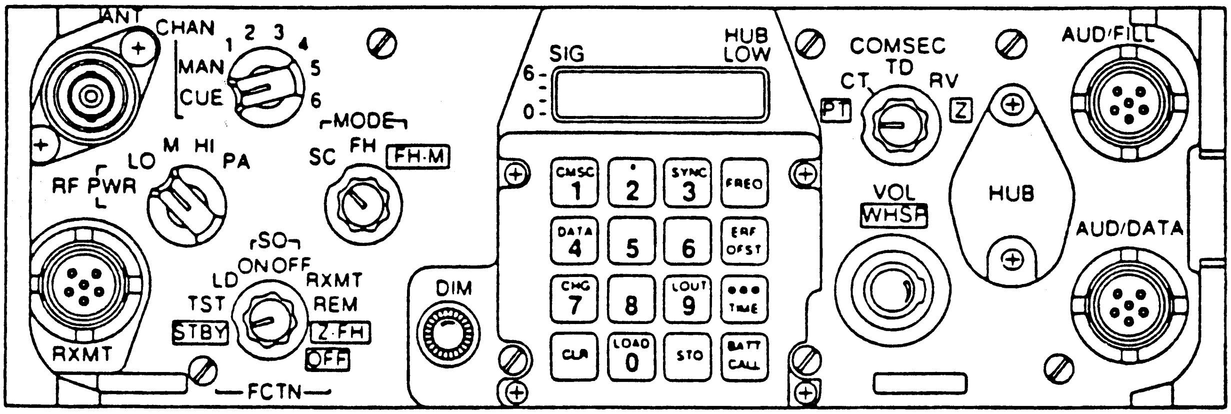


Fig 3-11. AN/PRC-119 front panel.

Now that you have covered the information about the AN/PRC-119, let's review. How many channels can be preset in the single channel (SC) mode?

If you answered eight preset channels, you are correct.

<u>Lesson Summary</u>. This lesson covered the basic characteristics of the AN/PRC-119 radio. In the next lesson, you will cover field expedient antennas.

Lesson 6. FIELD EXPEDIENT ANTENNAS

<u>LEARNING OBJECTIVES</u>

1. Match each type of antenna to its appropriate directional characteristic.

2. Given the appropriate data of a quarter wavelength antenna, identify the correct formula to obtain the length.

3. List four of the seven field expedient insulators.

4. Given illustrations of field expedient antennas, correctly match the name of the antenna with the appropriate picture.

5. Given a description of a field expedient antenna, correctly select the antenna with those characteristics.

3601. General Characteristics of Field Expedient Antennas

The most obvious reason to construct a field expedient antenna is for communication, either because the distance is too great for communicating or because your antenna is broken. Whatever your reason, remember that communication is very important. Field expedient antennas are simple to construct and are very effective. You must take the correct steps in constructing the antenna to enhance your radio transmission.

a. Communications terminology. Before learning about the various field expedient antennas, you need to understand certain communications terminology. The terminology and definitions for these antennas are listed below.

(1) Resistor. A resistor is a device used to decrease the flow of electrical current.

(2) Polarity. Radio waves being transmitted create positive polarity or power output. Radio waves being received, create negative polarity or power input.

(3) Full-wave. A term used to express the amount of wire required to construct a field expedient antenna e.g., the full wave length of the frequency that you use.

(4) Half-wave. A term used to express the amount of wire required to construct a field expedient antenna e.g., half the full-wave length of the frequency that you use.

(5) Quarter-wave. A term used to express the amount of wire required to construct a field expedient antenna e.g., a quarter of the wave length of the frequency that you use.

(6) Radiation. An antenna radiates energy at the speed of light. The energy of radio signals radiated by an antenna forms an electromagnetic field having a definite pattern, depending upon the type of antenna that you use.

b. Directional characteristics. When you fabricate an antenna, keep the following important factors in mind: the location of the station you will need to communicate with, the direction and distance of that station, and the selection of the right type of antenna. There are three types of antennas according to the directional characteristics shown below and on the following pages (figures 3-12 through 3-14).

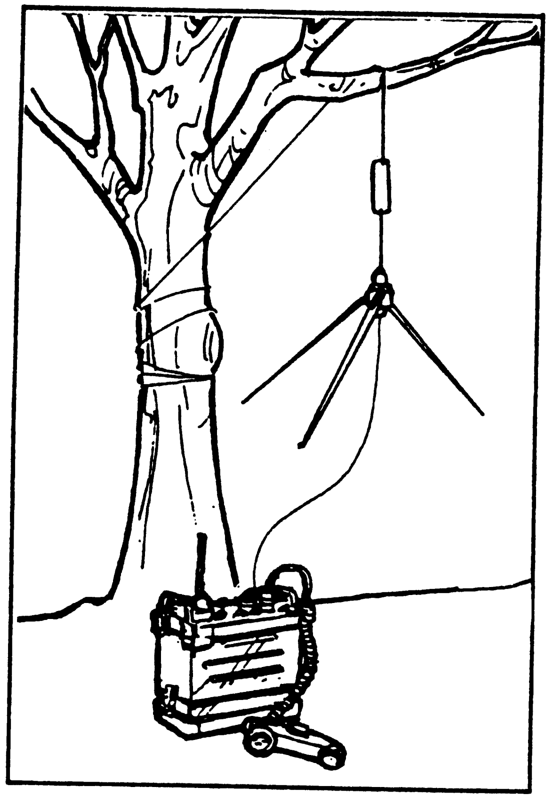


Fig 3-12. OMNI-directional, all directions.

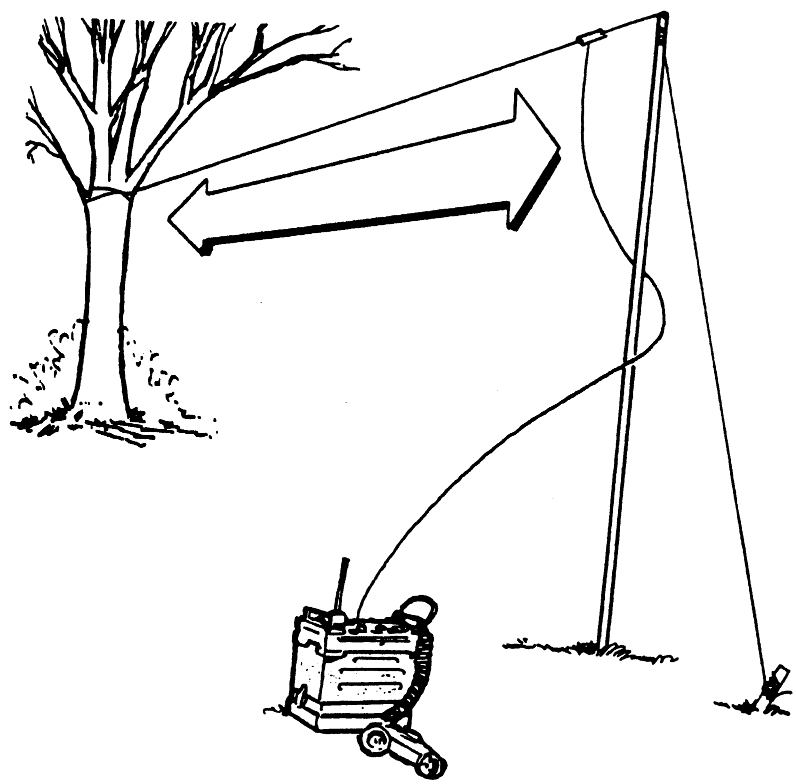


Fig 3-13. BI-directional, any two opposite directions.

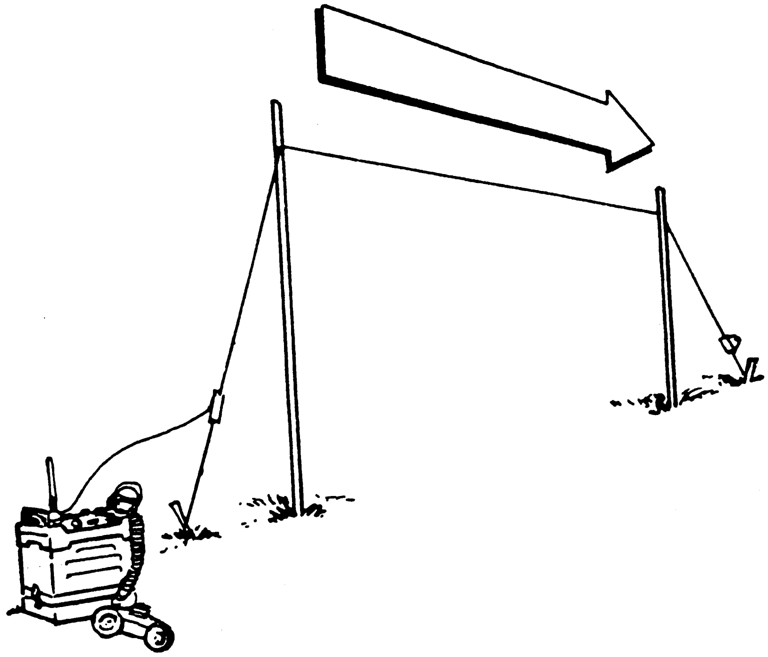


Fig 3-14. UNI-directional, any one direction.

Now that we have covered the directional characteristics of antennas, let's review. What do the terms BI-directional, UNI-directional, and OMNI-directional mean?

____

____

____

The correct answers are BI-directional, any two opposite directions; UNI-directional, any one direction; and OMNI-directional, all directions.

3602. Expedient Antenna Lengths

To be most effective, you need to cut the field expedient antenna to its proper length. Although the antenna will work when not cut exactly to its proper proportion, you will achieve much better transmission and reception when done correctly.

a. <u>Formulas and HF/VHF quick reference chart</u>. You can determine the length of the antenna by using the proper formula or the quick reference chart below (fig 3-15).

(1) To figure a quarter wavelength antenna in feet, divide 234 by your operating frequency in MHz, example: 234 divided by 44.8 = 5.22 or 5'2".

(2) To figure a half wavelength antenna in feet, divide 468 by your operating frequency in MHz, example: 468 divided by 56 = 8.36 or 8'5".

(3) To figure a full wavelength antenna in feet, divide 936 by your operating frequency in MHz, example: 936 divided by 45 = 20.8 or 20'10".

(4) To convert feet to meters, multiply by .3048, example: 110 feet x .3048 = 33.5 meters.

(5) To convert meters to feet, multiply by 3.28, example: 100 meters x 3.28 = 328 feet.

HIGH FREQUENCY(HF) ANTENNA LENGTH IN FEET & INCHES				VERY HIGH FREQUENCY (VHF) ANTENNA LENGTH IN FEET & INCHES			
Op Freq in MHZ	1/4 Wave	1/2 Wave	1 Wave	Op Freq in MHZ	1/4 Wave	1/2 Wave	1 Wave
2	117'	234'	468'	30	7'10"	15'7"	31'2"
3	78'	156'	312'	33	7'1"	14'2"	28'4"
4	58'6"	117'	234'	35	6'9"	13'5"	26'10"
5	46'9"	93'7"	187'4"	37	6'4"	12'7"	25'2"
6	39'	78'	156'	40	5'10"	11'8"	23'4"
7	33'5"	66'10"	133'8"	43	5'5"	10'10"	21'8"
8	29'3"	58'6"	117'	45	5'3"	10'5"	20'10"
9	26'	52'	104'	48	4'10"	9'8"	19'4"
10	23'5"	46'10"	93'8"	50	4'9"	9'5"	18'10"
11	21'3"	42'6"	85'	55	4'3"	8'6"	17'
12	19'6"	39'	78'	57	4'1"	8'2"	16'4"
13	18'	36'	72'	60	3'11"	7'10"	15'8"
14	16'9"	33'5"	66'10"	65	3'7"	7'2"	14'4"
15	15'7"	31'5"	62'4"	68	3'5"	6'10"	13'8"
16	14'7"	29'2"	58'4"	70	3'4"	6'7"	13'2"
17	13'9"	27'6"	55'	75	3'1"	6'2"	12'4"
18	13'	26'	52'	80	3'	5'11"	11'10"

Fig 3-15. HF/VHF Quick reference chart.

Remember that using the formulas and the quick reference chart helps you to determine the proper length of the expedient antenna and gives you a better communicating range.

3603. Expedient Communication Equipment

When in the field, whether it be in combat or in a training situation, there may come a time when you will have to improvise. As a Marine, you have become very accustomed to using many unconventional means when the proper gear to accomplish your tasks is not available. You must "drive on" and search for a way to accomplish what must be done. When dealing with communications, it could very well mean the difference between life and death.

Listed below are some field expedient items that will help get the job done in an emergency.

Original Issue	Field Expedient
If this item is not available ...	Then use ...
Antenna wire	Barbed wire, electrical wire, coaxial cable
Antenna mast	Trees, sticks, lance pole, telephone pole
Coaxial antenna	Electrical wire
Antenna guy rope	Wire, cloth belts
Guy stakes	Wire, coaxial cable
Whip antenna	Wire, coaxial cable
Pulleys	Wire, nylon rope
Insulators	Plastic rings, plastic spoons, plastic bags, wood, rope, rags, and bottles

Field expedient insulators. Insulators prevent undesired current paths or short circuits to ground. Standard insulators are supplied with the system but when they are unavailable, you'll have to use materials made of porcelain, glass, rubber, and plastic as expedient insulators. Figure 3-16 illustrates common items that are readily available for you to use as expedient insulators.

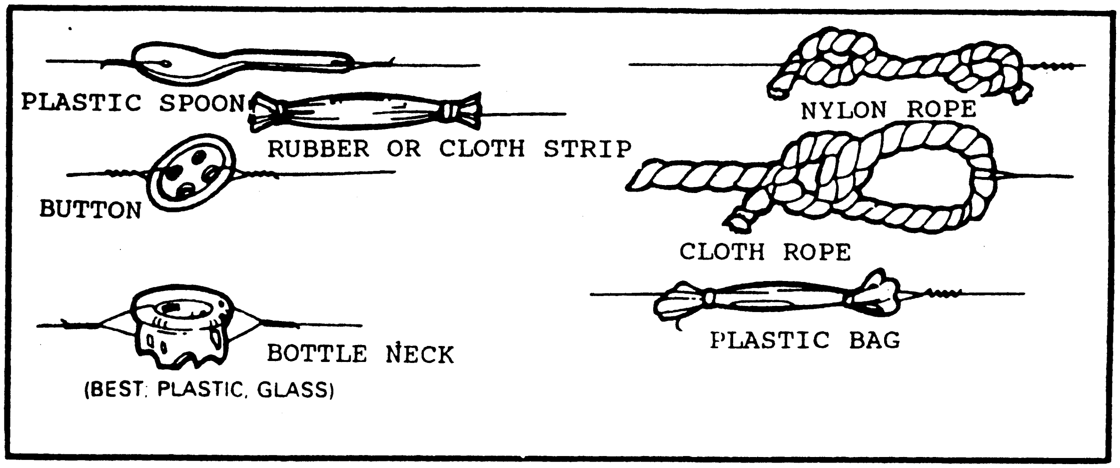


Fig 3-16. Field expedient insulators.

3604. Expedient Antennas

Radio communications is affected by many factors. Two of them are atmospheric occurrences and radio set location. Even though they may be several million miles away, sun spots and other atmospheric phenomena have a direct effect on communications. The direction of transmission and receiving can also affect your communications. For example, if the receiving radio sets are located in all different directions from the transmitter, you might use an omni-directional antenna. However, if the receiving sets are located in the same general direction from the transmitter, such as east and west or north and south, you should use a directional antenna. Listed below are different types of field expedient antennas. Remember that all the antennas work well if you use them properly.

a. <u>Half-wave center fed antenna</u>. The half-wave center fed antenna (fig 3-17) is bi-directional. Because the center fed antenna radiates on both sides your transmission range in these two directions greatly increases. The antenna is suspended in the air at a height of 10 to 50 feet. Ideally, it should be as close as possible to one-half wave lengths above the ground.

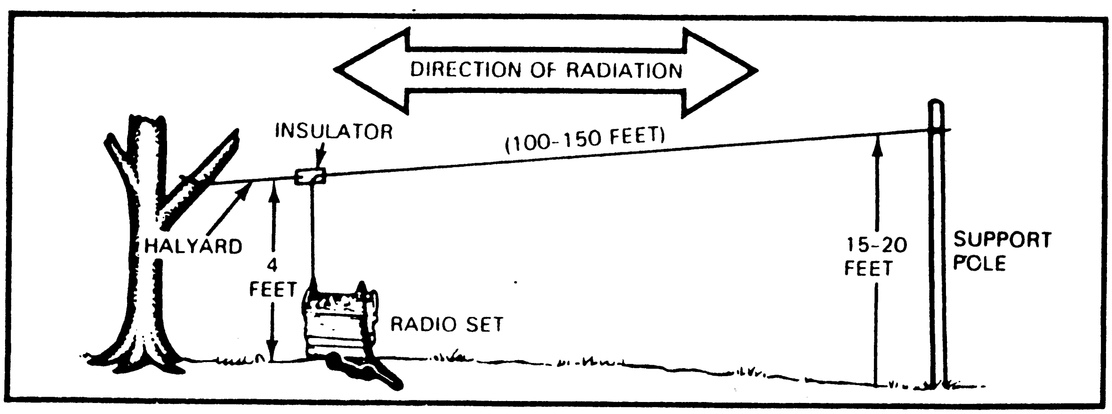


Fig 3-17. Improvised half-wave center fed antenna.

b. <u>Half-rhombic antenna.</u> The half-rhombic antenna (fig 3-18) is a terminated vertical antenna. With the half-rhombic antenna, you would use an unbalanced transmission line and a ground or counterpoise. As a result, a vertically polarized audio wave is produced and the antenna is bi-directional. You can also make the antenna uni-directional by connecting a resistor of about 500 ohms between the far end of the antenna and the ground.

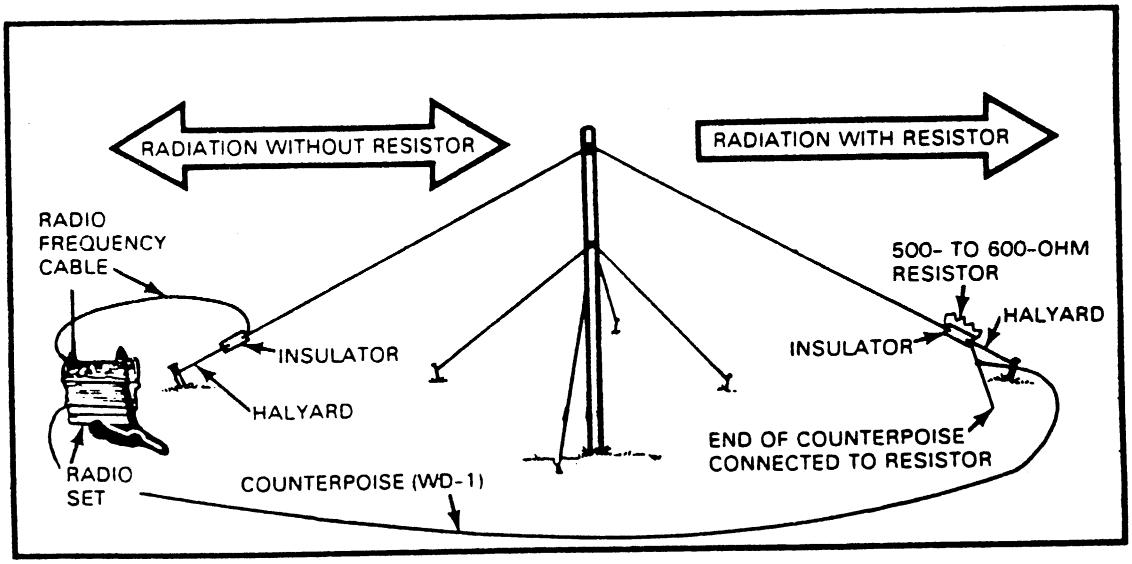


Fig 3-18. Half-rhombic antenna.

c. <u>Sloping "V" antenna</u>. The sloping "V" antenna (fig 3-19) consists of downward sloping wires arranged to form a "V" and is fed with current of opposite polarity. The greater the leg length, the greater effect of gain and directivity of the antenna. The antenna is bi-directional.

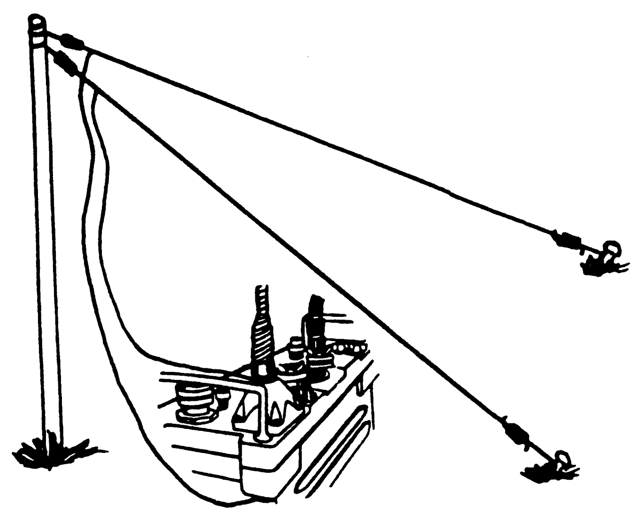


Fig 3-19. Sloping "V" antenna.

d. <u>Vertical wire antenna</u>. The vertical wire antenna (fig 3-20) looks similar to the center fed antenna, but uses two less insulators and one less wire connection. The antenna is omni-directional, and serves well as a replacement for whip antennas.

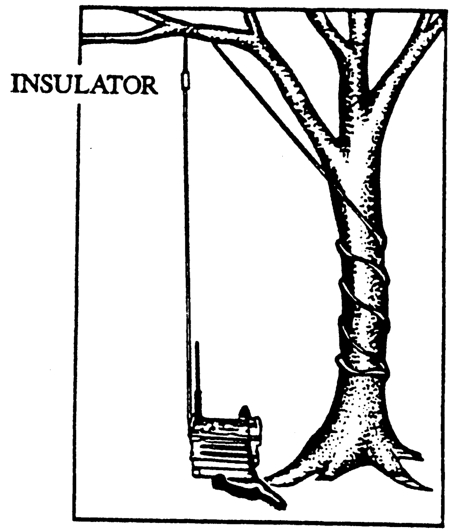


Fig 3-20. Vertical wire antenna.

e. <u>Sloping wire antenna</u>. The sloping wire antenna (fig 3-21) is uni-directional. This antenna is one of the more easier antennas to construct. A stone or something nonconductive is tied to the far end of the antenna which is simply thrown over a tree, forming an angle of 30 to 40 degrees. Use higher angles over 45 degrees for groundwave and lower angles for skywaves.

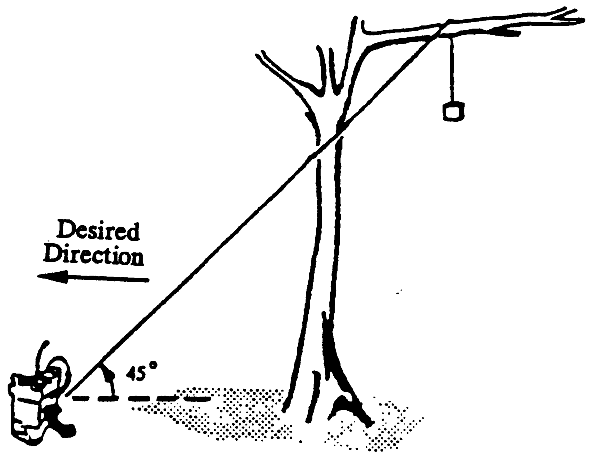


Fig 3-21. Sloping wire antenna.

Lesson Summary. This lesson covered directional characteristics and the use of field expedient antennas. Using the information from both this lesson and study unit will greatly enhance your communications ability.

Unit Exercise: Complete items 1 through 31 by performing the action required. Check your responses against those listed at the end of this exercise.

1. State the two factors that play an important role in positioning communications equipment.

____

____

2. During the occupation of a clandestine patrol base, your patrol leader wants you to distract the enemy and mask the patrols movement by calling artillery support on one of your target reference points, which is approximately a 1000 meters away. Select the appropriate course of action to enhance your radio transmission.

   a. (1) Ensure all connecting parts have had preventive maintenance performed.
      (2) Position your antenna as high as you can to overcome obstacles.
      (3) Keep your radio as far back as possible from obstacle in the direction of transmission.
      (4) Avoid all electrical power sources.

   b. (1) Position the radio in low concealed areas.
      (2) Place the radio near natural lines of drift.
      (3) Position the antenna as high as you can.
      (4) Keep the radio as far back as possible from obstacles.

   c. (1) Avoid any electrical power sources.
      (2) Avoid locating your antenna near metal objects.
      (3) Point the radio antenna in the direction of transmission.
      (4) Position the radio in low concealed areas.

   d. (1) Position the radio as high as you can.
      (2) Point the radio antenna in the direction of transmission.
      (3) Position the radio in low concealed areas.
      (4) Connect the antenna to high tension wires.

3. Select the length of time the AN/PRC-104 must warm up before using it.

a. 1 minute
b. 2 minutes
c. 3 minutes
d. 4 minutes

4. The AN/PRC-104, when set up to operate in a fixed location, has the capabilities to use three different antennas besides the 10ft whip. Select the correct three antennas the radio can use.

a. Double tape antenna, AS-2258, half-wave dipole
b. AS-2259, half-wave dipole, triple wave slant
c. AS-2359, half-wave dipole, quarter wave slant
d. Quarter wave slant, AS-2259, half-wave dipole

5. Identify the correct set-up procedures for the AN/PRC-104.

(1) Attach the power source.
(2) Remove the receiver transmitter-amplifier coupler combination from the carrying case.
(3) Ensure the Volume Off/Max switch in the off position.
(4) Open the accessory/carrying case.
(5) Unfasten the case latches and remove the cover.
(6) Set the Side Band Select switch to USB, and set the volume to desired level.
(7) Set the frequency to 2.221.2 KHz.
(8) Attach the antenna shock mount with the whip antenna.
(9) Connect the handset to the Audio connector.
(10) Set the frequencies.

a. 4,5,2,3,1,8,9,10,7,6
b. 4,5,2,3,1,8,9,7,6,10
c. 4,5,2,3,1,6,7,8,9,10
d. 4,5,2,3,10,6,7,8,1,9

6. The AN/PRC-113 is a ___ band, portable radio set.

a. one
b. two
c. three
d. four

7. The range of AN/PRC-113 is

a. line of site for ground-to-ground communications.
b. 15 miles for ground to ground communications.
c. 20 miles for air to air.
d. 23.2 miles for surface to ground.

8. Identify the correct set-up procedures for the AN/PRC-113 radio.

(1) Adjust the dim control
(2) Connect the handset
(3) Connect the antenna
(4) Install the batteries
(5) Switch on the On/Vol control knob
(6) Select mode of operation
(7) Load preset channels
(8) Transmit by operating the push to talk switch
(9) Select manual frequency
(10) Observe display decimal point

a. 4,3,2,5,1,10,9,7,6,8
b. 4,3,2,5,1,10,6,7,8,9
c. 4,3,2,1,5,10,9,6,7,8
d. 4,3,2,1,5,6,7,8,9,10

9. The AN/PRC-68 is designed specifically for short ranges from _______ yards to _______.

a. 200, 1/2 mile
b. 300, 1 mile
c. 400, 3 miles
d. 400, 5 miles

10. The number of channels you can preset on the AN/PRC-68 is

a. 4.
b. 6.
c. 7.
d. 10.

11. State the three main components of the AN/PRC-68.

____

____

____

12. The range of the AN/PRC-119 when switched on HI (high) is __________ kilometers.

a. 2 to 3
b. 4 to 8
c. 8 to 9
d. 9 to 10

13. How many channels can be preset on the AN/PRC-119 in the SC (single channel) mode?

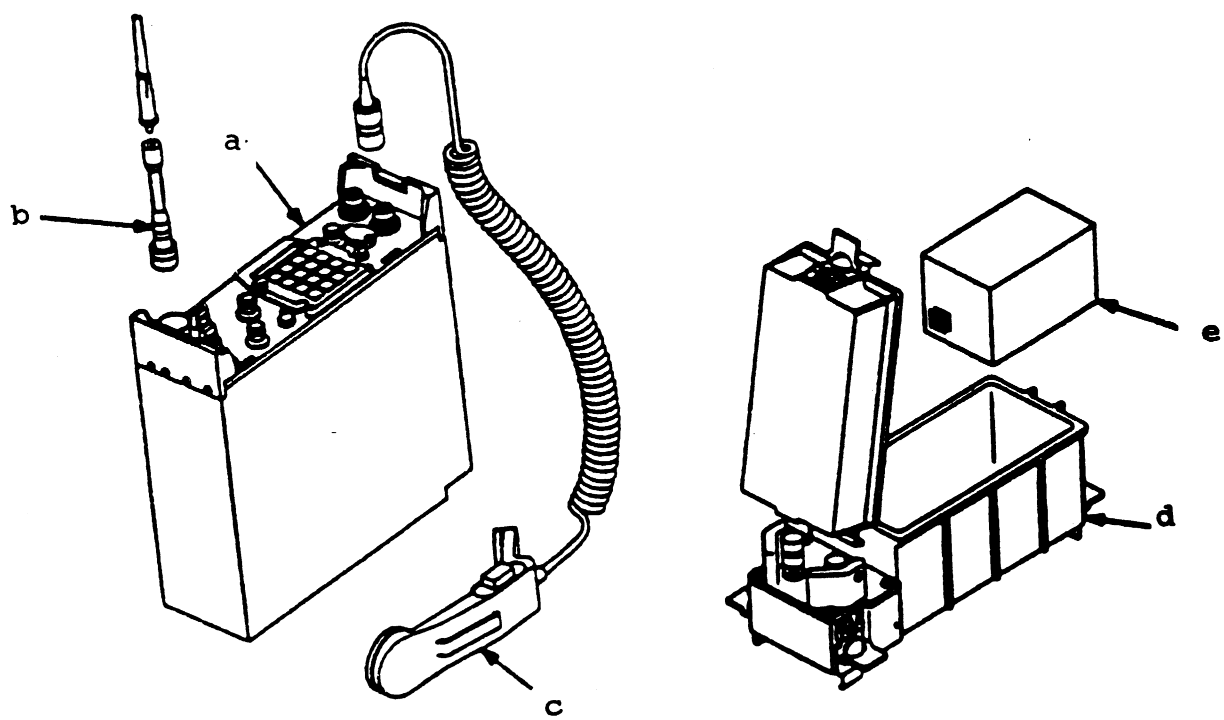
a. 4
b. 6
c. 8
d. 10

14. The battery life of the AN/PRC-119 is __________ **hours.**

a. 13 to 15
b. 15 to 17
c. 17 to 19
d. 18 to 20

Matching: Match the letter of the AN/PRC-119 component illustrated below with its corresponding name in items 15 through 19. Place your responses in the spaces provided.

____15. Battery
____16. Receiver-transmitter
____17. Battery box
____18. Manpack antenna
____19. Handset



Matching: For items 20 through 22, match the antenna in column 1 to its directional characteristic in column 2. Place your response in the spaces provided.

Column 1	Column 2
Antenna	Characteristic
____20. Omni-directional	a. Any two opposite directions
____21. Bi-directional	b. All directions
____22. Uni-directional	c. Any one direction

23. To obtain the length of a quarter wavelength antenna in feet, using the operating frequency of 44.8, identify the correct formula you would use.

    a. Divide 264 by the operating frequency.
    b. Divide 254 by the radio call sign.
    c. Divide 234 by the operating frequency.
    d. Divide 468 by the operating frequency.

24. Identify the seven field expedient insulators.

    a. Plastic spoon, button, bottle neck, plastic bag, rubber or cloth strip, nylon rope, and cloth rope.
    b. Metal, boots, books, trash cans, plastic bag, nylon rope, and rubber.
    c. Plastic spoon, button, bottle neck, boots, metal pipes, copper poles, and rubber.
    d. Metal pipes, copper, trash cans, plastic bag, nylon rope, plastic spoon, and books.

Matching: For items 25 through 29, correctly match the antenna name in column 1 with the illustrations below. Place your responses in the spaces provided.

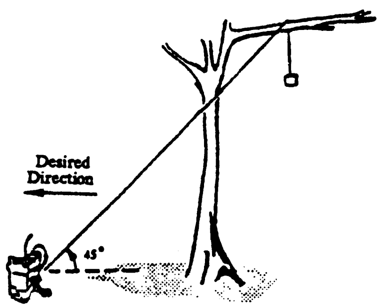
Column 1

Antenna

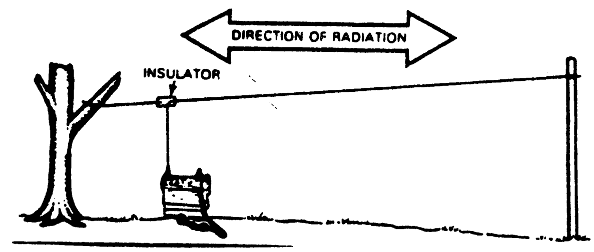
_____25. Half-rhombic
_____26. Half-wave center fed
_____27. Sloping "V"
_____28. Vertical wire
_____29. Sloping wire

Illustrations

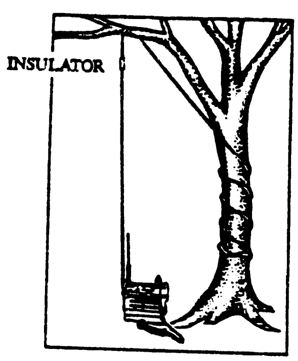
a.



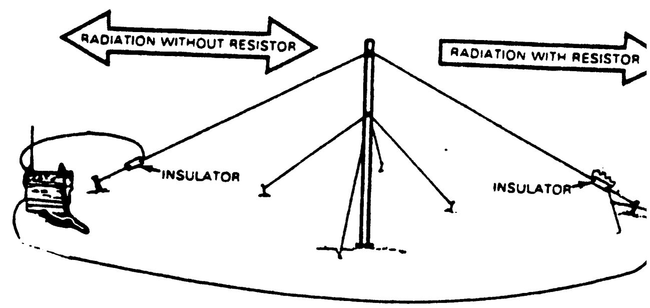
d.



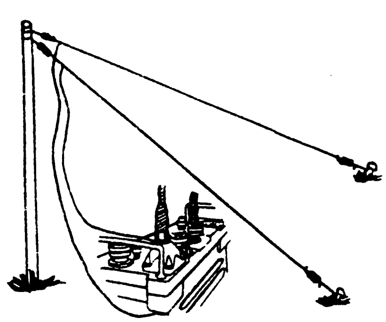
b.



e.



c.



30. The field expedient antenna that is fed with current of opposite polarity and when its legs are lengthened increases the effect of gain and directivity is the ________________ antenna.

a. vertical wire antenna
b. sloping wire antenna
c. sloping "V" antenna
d. half-rhombic antenna

31. List the three ways to avoid detection during radio communication.

____

____

____

UNIT SUMMARY

This study unit provided information on basic communications equipment and field expedient antennas. The study unit was not intended to make you an expert in the field of communications, but to give you an overview of positioning communications gear, the AN/PRC-104, AN/PRC-113, AN/PRC-68, and the AN/PRC-119.

Study Unit 3 Exercise Solutions

		Reference
1.	Optimum communications Camouflage your equipment	3101a
2.	a.	3101b
3.	a.	3201c
4.	d.	3201e
5.	b.	3201c
6.	b.	3301a
7.	a.	3301a
8.	a.	3301c
9.	b.	3401a
10.	d.	3401b
11.	Battery box Receiver transmitter Short antenna	3401c
12.	b.	3501a
13.	c	3501b
14.	d.	3501a
15.	e.	3301b
16.	a.	3301b
17.	d.	3301b
18.	b.	3301b
19.	c.	3301b
20.	b.	3601b
21.	a.	3601b
22.	c.	3601b
23.	c.	3602a
24.	a.	3603a
25.	e.	3604b
26.	d.	3604a
27.	c.	3604c
28.	b.	3604d
29.	a.	3604e
30.	c.	3604c
31.	Camouflage Terrain shielding Hillside to hillside	3101c

STUDY UNIT 4

INITIAL TERMINAL GUIDANCE (ITG)

Introduction. Marine Corps doctrine delineates two distinct sectors of helicopter landing area intelligence. The first is the helicopter landing survey area (HLSA) and the second is the pre-landing reconnaissance. The HLSA can be conducted weeks or months prior to the landing. It involves the integration of all available data from sources such as intelligence, meteorological data, existing maps, sketches, and aerial and ground photographs. When this data is insufficient, which is generally the case, the reconnaissance units, as requested, provide the data necessary for the completion of the HLSA. As a member of a recon team, you may be assigned the mission of conducting a complete HLSA or "the mission of gathering specific data" which is unavailable from other sources. The pre-landing reconnaissance is the last minute confirmation of earlier reports. It includes the current enemy situation and local weather reports, which may be obtained from aerial photographs, infantry patrols, or the friendly civilian population. The mission of pre-landing recon is normally conducted by terminal guidance teams. These are recon teams that are inserted into the landing area a few hours prior to the landing (fig 4-1). They collect and report this last minute information and then provide guidance for the initial flight of helicopters. During this study unit, you will cover the missions, organization, and terminology of ITG (Initial Terminal Guidance).

Fig 4-1. Reconnaissance team insertion.

Lesson 1. ITG MISSIONS/TERMINOLOGY

LEARNING OBJECTIVES

1. Identify the five possible missions an ITG team can perform.

2. Identify the different methods of insertion for an ITG team.

3. Match each terminal guidance term with its appropriate definition.

4101. Missions, Insertions, and Equipment

The mission of an initial terminal guidance team is to vector or guide helicopters into a specified point of the helicopter landing zone.

a. Missions. When conducting ITG, your mission may include the following:

(1) Conducting terrain reconnaissance in the vicinity of the preselected HLZ's.

(2) Clearing, marking, and preparing the HLZ's for ITG operations.

(3) Providing the pre-H hour reports of enemy activities, obstacles, and weather encountered in the HLZ during daylight or night helicopter assault operations.

(4) Providing ITG (navigational assistance) to assault waves of helicopters when required (fig 4-2).

(5) Providing landing assistance and limited traffic control facilities for helicopter assault operations conducted during periods of reduced visibility.

Reconnaissance ITG teams may conduct other missions not specified above which may be assigned by a higher headquarters.

Fig 4-2. Assault wave of helicopters.

b. Insertions. ITG teams, as with all reconnaissance units, are capable of being inserted into the general vicinity of the HLZ by many different methods. Listed below are various methods used by ITG teams.

(1) Parachute. The most feasible and uncompromising method of insertion.

(2) Helicopter. Helicast or inserted inland.

(3) Motor vehicle. Trucks used to drop Marines off at designated insertion areas.

(4) Landing craft. Used when the possibility of enemy contact is not expected near the beach.

(5) Rubber boat. Can be launched from a submarine or high speed transport.

(6) Infiltration. Infiltrate as a ground patrol.

c. Equipment. ITG equipment requirements are based on the assigned mission, terrain, enemy situation, and method of insertion and extraction into and out of the Recon Area of Operations (RAO).

The following equipment may be used by terminal guidance teams:

(1) Axes, hatchets

(2) Machetes

(3) Tree climbers

(4) Wire cutters

(5) Demolitions

d. Landing zone marking equipment. Additional equipment used to actually mark the HLZ is as follows:

(1) Glide path approach indicator light (GAIL)

(2) Anemometer, windspeed

(3) Signal batons

(4) Smoke grenades

(5) Air panels

(6) Strobe lights

(7) Signal mirrors

(8) Visual approach path indicator (VAPI)

Now that you have covered the missions, equipment, and insertions of ITG teams, let's review. What are the five missions that can be assigned to an ITG team?

(1) ____________________

(2) ____________________

(3) ____________________

(4) ____________________

(5) ____________________

The correct answers are conducting terrain recon in the vicinity of the HLZ; clearing and marking HLZs; providing pre-H hour reports on the enemy, obstacles, and weather in HLZ; providing ITG; and providing landing assistance and limited traffic control.

4102. ITG Definitions

As with many tasks performed in the Marine Corps, the mission of ITG is unique. To perform the task of ITG, you need to become familiar with the terms used. You need to pay close attention to the definitions on the following page. During the course of this study unit, you will continually see these terms.

ITG TERMINOLOGY	DEFINITION
Helicopter landing zone (HLZ)	HLZ is defined as a specific ground area used for landing a helicopterborne force. HLZs are usually designated by the name of a bird, for example, LZ-Hawk or LZ-Bluebird.
Helicopter landing area (HLA)	HLA is exactly what the name implies; an area in which a helicopterborne assault will be landed. It is made up of one or more HLZs.
Helicopter wave	One or more helicopters grouped under a single leader and scheduled to land in the same landing zone approximately at the same time.
Landing site	Landing sites are defined as an area within a landing zone where waves, flights, or flight increments of helicopters will land. Landing sites are designated by colors such as landing site Green or landing site Blue.
Landing point	A specific point on the ground where the helicopter will land. It may be designated by a 2-digit number.
Initial point (IP)	Serves as an air central point (IP) within a 2-mile radius of the landing zone from which individual flights of helos are directed to their prescribed landing sites.
Terminal guidance	Any electronic, mechanical, visual, or other assistance given to helicopter pilots to facilitate arrival within, operating over, or departure from a landing zone.
Initial terminal guidance (ITG)	Assistance given to the pilots of leading helicopter waves. Initial terminal guidance ceases upon the arrival and establishment of the landing zone control center (LZCC) and upon direction of competent authority.

ITG TERMINOLOGY	DEFINITIONS
Helicopter support team (HST)	A task organized unit which is formed and equipped for employment in an HLZ; duties include: load and unload helicopters, emplace and operate navigational aids, participate in local HLZ security, and evacuation of casualties and EPWs.
Landing zone control center (LZCC)	An element of the HST. These personnel conduct landing zone traffic control and are normally landed in the early assault waves. Once landed and prepared, they relieve the reconnaissance teams of ITG mission.
Landing signalman enlisted (LSE) signals	LSE signals are visual hand and arm signals used by ITG personnel to tell pilots where to land their helicopters.
Landing zone control team (LZCT)	The LZCT establishes communications with inbound helicopters and controls the HLZ during ITG missions.

Let's review. What does the term "initial terminal guidance" mean? ______________________________

If you said, "assistance given to the pilots of leading helicopter waves," you are correct.

Lesson Summary. During the first lesson, you have covered ITG missions and terminology. During the second lesson, you will cover organization of the ITG team and how to establish ITG.

Lesson 2. ESTABLISHING ITG

LEARNING OBJECTIVES

1. Identify the organization of an ITG team.

2. Identify the five priorities of work when preparing an HLZ.

3. Given a situation, determine the correct method for marking the HLZ.

4. Given specified LSE signals, match each signal with the appropriate illustration.

4201. ITG Organization

Organization of an ITG team will vary slightly depending on the particular reconnaissance unit you are assigned to and the time of day in which the mission will be performed. There are, however, specific jobs that must be performed during ITG.

Team Organization. There are no hard and fast numbers associated with the composition of an ITG team. These teams are task organized to perform an assigned mission. The team is well balanced, flexible, highly trained, and capable of performing its primary mission. The primary elements of the ITG team are the landing zone control team, landing site team(s), and the security team (fig 4-3). If an initial point (IP) is required, the initial point party will be utilized to perform this mission, otherwise the initial point party is not one of the primary elements of the ITG team. The number of helos and assigned landing sites in the HLZ will dictate the number of Marines in the ITG team. Keep in mind that depending on the particular unit you are assigned and the time of day in which the mission will be performed, the organization may vary slightly.

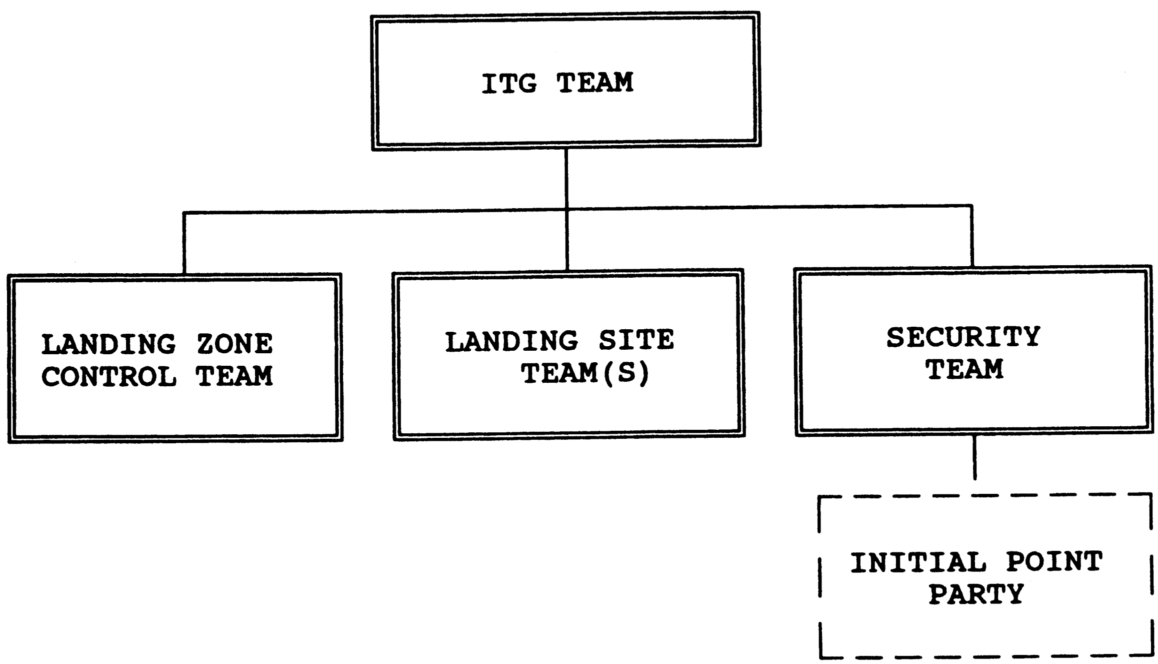


Fig 4-3. ITG team organization.

Now that we have covered the organization of the ITG team, let's review. What are the primary elements in the organization of an ITG team?

(1)_______________________

(2)_______________________

(3)_______________________

If you answered the landing zone control team, landing site team(s), and the security team, you are correct. Now that we have covered the organization, let's move on to what each element does during an ITG mission.

a. Landing zone control team. The LZCT consists of the team leader, ITG control net radio operator, an air/ ground radio operator, messenger, and the assistant team leader. As a young recon Marine, you may be assigned one of these tasks, depending on your knowledge and experience.

(1) Team leader has overall responsibility, (including the responsibility for carrying out the mission). He supervises the establishment and operation of the landing zone. His duties and responsibilities include:

(a) Maintaining communications with the incoming helicopters.

(b) Vectoring the initial assault waves of helicopters to the landing zone.

(c) Controlling of air traffic in the immediate area of the landing zone until properly relieved by elements of the HST arriving with the initial waves.

(d) Acting as ground-to-air radio operator in an emergency.

(2) Assistant team leader is the second in command. He aids the team leader by supervising and coordinating all the actions listed above.

(3) ITG control net radio operator establishes and maintains local communications within the landing zone utilizing an FM radio. He serves as the net control station for the ITG team and relays all messages from team leader to the landing site teams.

(4) Air/ground radio operator. Operates the landing zone control net utilizing the AN/PRC-77 ground-to-air radio set. His duties include the following:

(a) Maintains continuous communications with the assault waves of helicopters.

(b) Supplies aerological and tactical information to the helicopters.

(c) Directs helicopters in the immediate vicinity of the HLZ using voice radio instruction.

(d) Relays all messages from the team leader to the helicopter flight leaders.

(5) Messenger. Carries out duties as directed by the team leader.

b. Landing site team(s). Each team consists of the landing site NCO and the fieldmaster. Depending on the size of the HLZ and the number of required landing points, these important factors will determine how many landing site teams you will need.

(1) Landing site NCO. He is responsible for the satisfactory operation of a landing site. He obtains the speed and direction of the wind, the landing azimuth, number of landing points available, and number and placements of obstacles; and he estimates the number of enemy personnel in the area. This information is relayed to the team leader via the ITG control net (ITGCN). Upon confirmation of the landing azimuth from the LZCT, the site NCO clears and marks the landing points and directs the positioning of the visual navigational aids. He provides LSE signals when necessary to land the helicopters. He sets up troop assembly aids such as air panels, smoke, horns, and whistles, or provides physical guidance to the troops who are landing and getting off the helos.

(2) Fieldmaster. Assists the landing site NCO in the operation of the landing site.

c. Security team. The security team will provide security for the ITG team while it performs its mission. The security team is not large enough to engage conventional forces. It is primarily used to alert the ITG team, and if necessary, provide time for the teams to withdraw to safety if attacked.

d. Initial point party. If an initial point (IP) is used, then the initial point party will direct the heliborne waves to a specific HLZ.

4202. Preparation of the Helicopter Landing Zone

In many cases, if the HLZ that was selected by aerial reconnaissance or maps is not appropriate to use (too many rocks or trees or the ground is not level), the reconnaissance team will try to locate another HLZ. If locating another HLZ is not possible, the equipment carried by the team may be used to prepare the original HLZ. In either case, the ITG team has certain priorities that need to be followed to prepare the HLZ.

a. Landing zone priority of work. The ITG team establishes several landing sites within the landing zone and the command post for the landing zone control team. The amount of effort exerted toward preparing landing sites will depend on their intended use. The ITG team's priority of work and the procedures discussed below and on the following page are primarily for sites in forward areas and are within the capabilities of your team.

(1) Establish and maintain security around the HLZ.

(2) Erect and place in operation all ground-to-air radio/helicopter direction nets.

(3) Prepare the helicopter landing sites.

(4) Erect all visual and navigational aids.

(5) Prepare and mark troop assembly areas.

Now that we have covered the priority of work for an ITG team, let's cover what needs to be done to the landing site.

b. Considerations when preparing the landing site. The recon team uses engineer tools and demolitions to prepare the landing sites and points for inbound helicopters. The five considerations when preparing a landing site are listed below and on the following page.

(1) Approaches and exits. The rule of thumb for determining distance required between a landing point and high obstructions usually is a 10:1 ratio but a 5:1 ratio can also be used. This means that the landing point should be ten times as far from a tree as the tree is high.

(2) Ground obstacles. Obstacles on the ground such as stumps or rocks should not exceed 1 foot in height on level ground and should be less on sloping ground.

(3) Gradient (slopes). Ground slope has considerable effect on the selection of a landing site or landing point. A helicopter cannot land safely where the ground slope is in excess of 14 degrees.

(4) Surface conditions. Mud, excessive dust, and loose debris are considered undesirable surface conditions for helicopters. Mud causes the helicopters to become bogged down. Excessive dust reduces visibility and may compromise the location of the landing site to the enemy, and loose debris could be sucked up into the rotor blades (or turbine intakes) causing serious damage to the helicopter. However, shallow water (less than 18 inches deep) with a firm bottom can be used as a landing site.

(5) Winds. If ground winds are in excess of 10 knots, then helicopters will land into the wind.

c. Marking the day HLZ. Landing sites should be equipped with a means of indicating wind direction and velocity usually by smoke or verbal radio message. The landing site team marks the landing site as prescribed by the team leader or as previously coordinated by the helicopter unit. Landing sites are normally marked in the following manner for daytime use:

(1) Smoke and landing point panels are used to mark a day landing site. They should be the same color as the designation of the landing site to aid in identifying the site to the helicopter. For example, LS GREEN uses green smoke and green landing points panels for marking the site.

(2) Obstacles that cannot be removed are marked by single red panels and their location reported to the landing zone control team for further relay to the helicopter waves.

(3) Flank panels of a different color than the landing point panels are used on the landing site to mark an assembly area for helicopter borne troops in daylight operations. They should not be red.

(4) Wind speed and direction in the landing site are relayed to the pilot by the landing zone control team. Smoke may also be used to indicate wind speed and direction.

d. Marking the night HLZ. The use of a helicopter landing zone at night or during periods of reduced visibility is inherently more complex than for daytime operations. Special lighting equipment or field expedient illumination is required. The following information is considered essential when marking a landing site at night:

(1) Outlines of the landing sites must be indicated by low intensity markers.

(2) Obstacles in the vicinity of the landing sites must be indicated either by low intensity markers or voice radio instructions.

(3) Wind direction must be indicated either by illumination (shooting up a pop up and watching its drift) or by voice radio instructions.

A slowdown in tempo is normal for night helicopterborne operations. (The requirement for positive control for landing of individual helicopters limits the number of landing points that can be established.) Flight safety considerations limit the size of helicopter formations and longer loading and unloading time increases the time interval between waves.

> Note: The standing operating procedures (SOP) for the organization and operation of landing zones at night vary among the different Marine helicopter squadrons. The organization and operation of the night HLZ previously discussed is not the only way of conducting terminal guidance at night.

As mentioned previously, marking the HLZ at night is different from marking it during the day. One obvious difference is that lighting is used. The following discusses the different methods of positioning the lighting equipment during night operations:

- Landing "T" marking. The "T" method of marking an HLZ (fig 4-4) is best used for approaches initiated from altitudes above 500 feet above ground level. The apparent distance between the light in the stem of the "T" can be used as a reference for maintaining a constant approach angle. The approach should be terminated in the upper left portion of the "T".

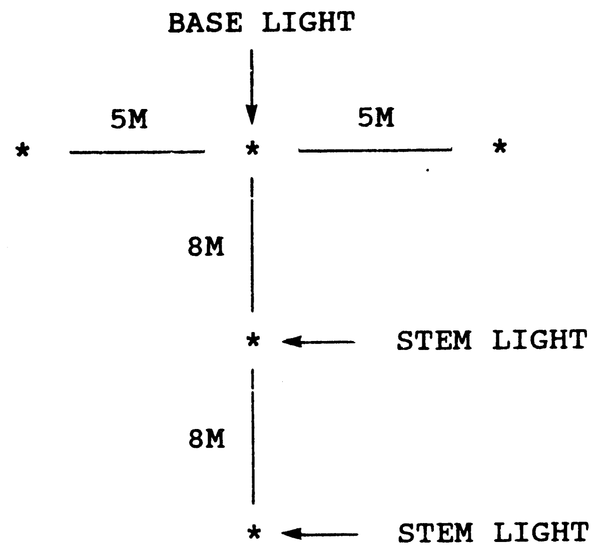


Fig 4-4. Landing "T".

The landing "T" used with the VAPI (Visual Approach Path Indicator) system is shown below in (fig 4-5).

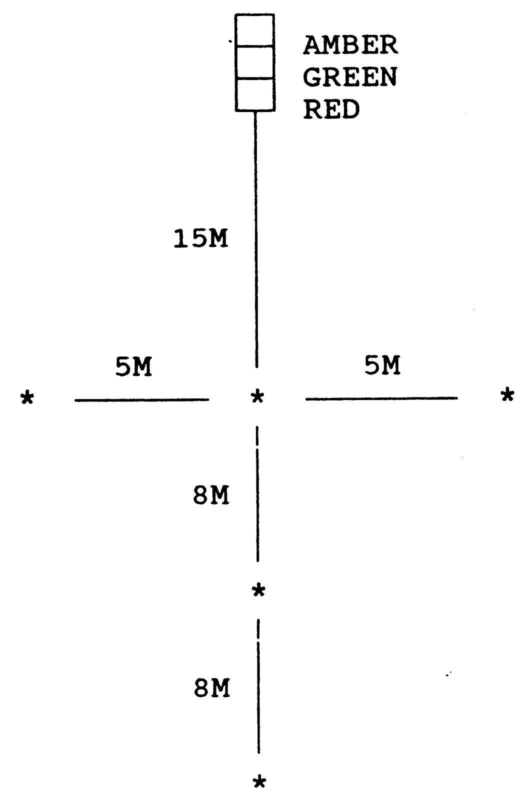


Fig 4-5. Landing "T" using the VAPI.

- <u>Inverted "Y" marking</u>. The "Y" method of marking an HLZ (fig 4-6) is best used for an approach initiated from terrain flight altitude. The desired touchdown point is midway between the front two lights with the fuselage of the aircraft aligned with the stem lights. A minimum of four lights is used.

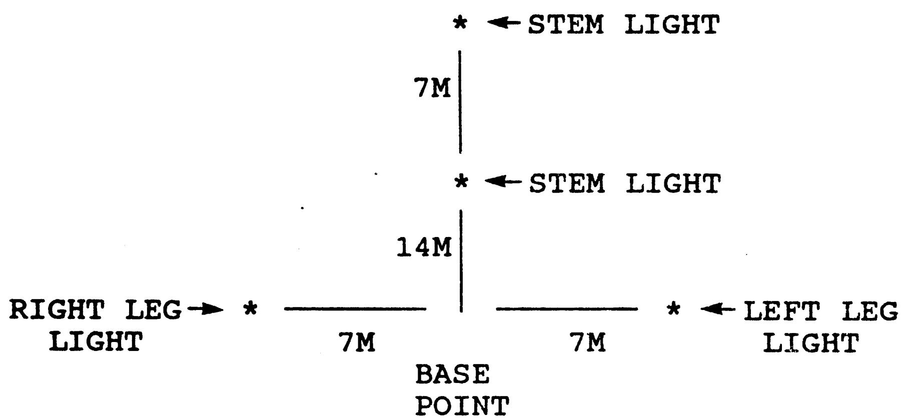


Fig 4-6. Inverted "Y".

The inverted "Y" method being used with the VAPI system (fig 4-7).

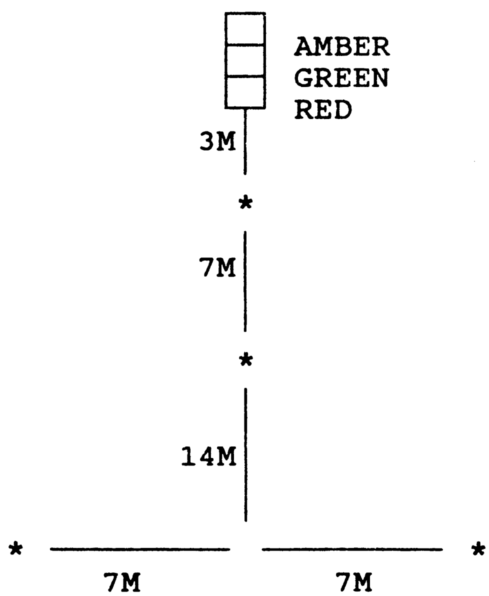


Fig 4-7. Inverted "Y" using VAPI.

Now that you have covered the priorities of work for HLZs and the way in which landing zones are marked, let's review. What are the five priorities of work for an ITG team?

(1)____

(2)____

(3)____

(4)____

(5)____

The correct answers are establish and maintain security; erect and place in operation radio nets; prepare the helicopter landing sites; erect visual and navigational aids; and prepare and mark troop assembly areas.

4203. Landing Signalman Enlisted (LSE)

These signals are provided on daylight operations when visibility is such that the pilot cannot see the landing points or obstacles because of dust, fog, or mud. These signals, when executed correctly, will help assist the pilot maneuver his aircraft safely.

a. <u>LSE duties</u>. All ITG personnel should be qualified in the use of LSE signals. The confidence of the pilot in the LSE's signals and the relative importance of the signals depends on the confident, precise manner in which the LSE gives the signal. The movements are sharp and precise. During periods of reduced visibility, ITG LSE's must use illuminated wands. Below are some of the basic principles by which the pilot operates and how he uses the LSE.

(1) <u>Responsibilities</u>. The pilot is responsible for his own approach and landing. However, he relies heavily on the LSE to warn him of conditions of which he is not aware of and to direct him to a safe landing point.

(2) <u>LSE signals</u>. The only LSE signal which must be given to the pilot by the LSE on the ground is the wave off. All other signals are advisory signals to the pilot. The decision to accept or reject a signal is solely the responsibility of the pilot. Responsibility for the safety of the aircraft can never be relinquished to the LSE. The waveoff signal is given when it is not safe for the helicopter to land.

b. <u>LSE signals</u>. The following signals (figs 4-8 through 4-18) are used for daytime ITG operations. Signals given at night are executed in the same manner except an illuminated amber director's wand is held in each hand.

(1) <u>Prepare for guidance</u>. Extending both arms above the head, palms facing inboard (fig 4-8).

Fig 4-8. Prepare for guidance.

(2) <u>Forward movement</u>. Raise both hands to shoulder level in front of the body, palms facing away from the helicopter. Move the hands in such a motion as to simulate a pulling motion (fig 4-9).

Fig 4-9. Forward movement.

(3) Backward movement. Extend both arms straight up above your head with palms facing the helicopter. Move your hands forward and back to simulate a pushing motion toward the helicopter (fig 4-10).

Fig 4-10. Backward movement.

(4) Move to the right. Extend arms horizontally sideways, with palms up. While keeping the arms straight, swing your right arm over the head in the direction you want the helicopter to go. Continue the arm motion until the helo has turned (fig 4-11).

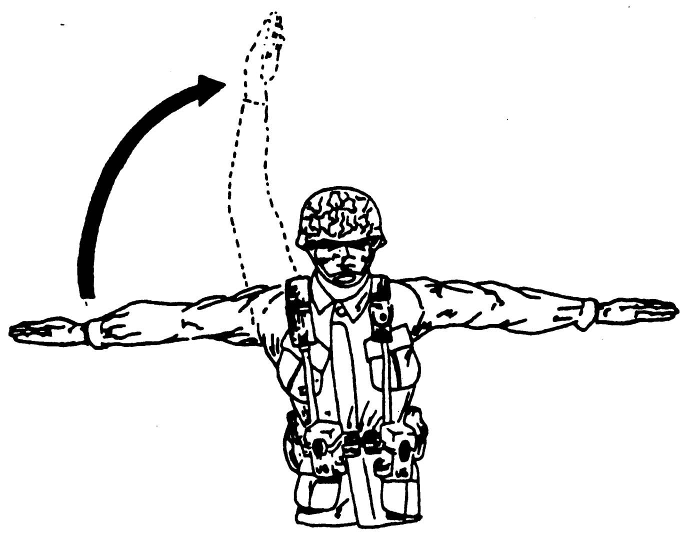


Fig 4-11. Move to the right.

(5) Move to the left. Extend arms horizontally sideways, palms up. While keeping the arms straight, swing your left arm over the head in the direction you want the helicopter to go. Continue the arm motion until the helo has turned (fig 4-12).

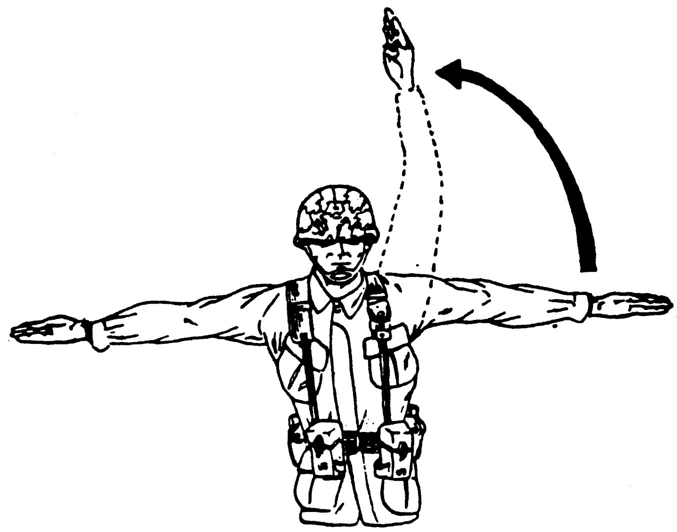


Fig 4-12. Move to the left.

(6) Move upward. Extend arms horizontally sideways and then move both arms in an upwards motion with palms turned up (fig 4-13).

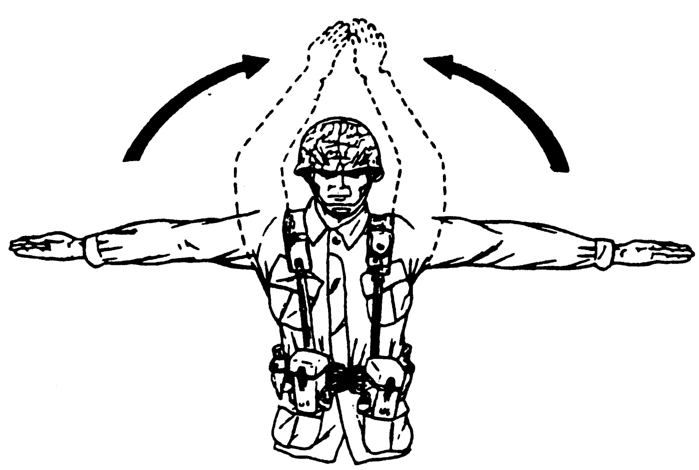


Fig 4-13. Move upward.

(7) Move downward. Extend arms horizontally sideways and then move both arms in a downwards motion with palms turned down (fig 4-14).

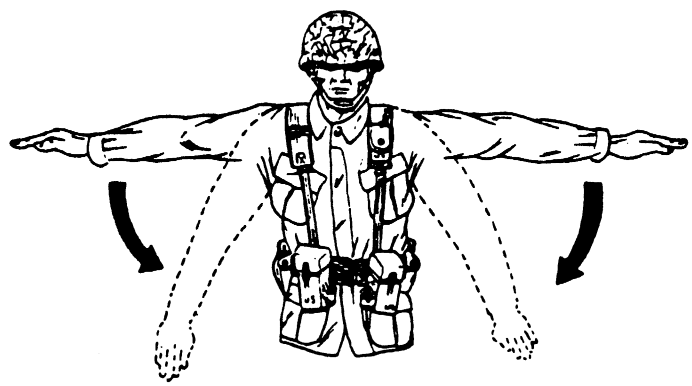


Fig 4-14. Move downward.

(8) Hover. Extend arms horizontally sideways, palms down, and remain in that position (fig 4-15).

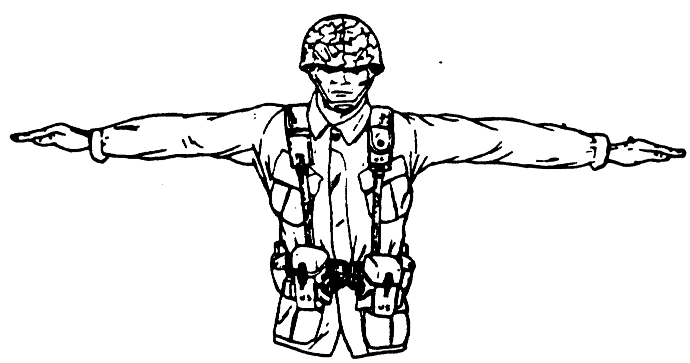


Fig 4-15. Hover.

(9) Land. Cross and extend both arms downward in front of your body, remain in that position until the helicopter has landed (fig 4-16).

Fig 4-16. Land.

(10) Take off. Execute circular motions of the right hand overhead, ending in a throwing motion into the direction of take off. (fig 4-17).

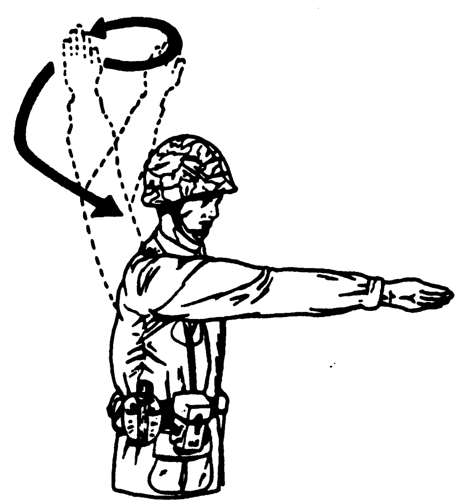


Fig 4-17. Take off.

(11) Wave off. Arms are waved rapidly at the same time they are being crossed over the head (fig 4-18).

Fig 4-18. Wave off.

c. Landing formations. The arrangement of the landing points within the landing site is normally dictated by terrain and wind conditions. When visibility is good and the landing site is spacious and free of obstacles, helicopter pilots will often disregard the layout of the site and choose their own landing points and formations. However, some general guidelines should be followed in laying out the site.

(1) Helicopters will normally land and take off into the wind to gain additional lift and control.

(2) The flight leader's landing point should be placed farthest upwind so that the other pilots can always observe him while landing and taking off.

(3) A column or echelon formation is usually preferred by helicopter pilots when landing.

d. Concept of operation of the HLZ. The landing zone control team net is placed in operation and monitored about 15 minutes prior to the scheduled arrival of the first wave of helicopters. Actual communications between the helicopter wave and LZCT are initiated by the flight leader as he passes over the initial point. The ITG control net (ITGCN) is placed in operation as soon as the ITG team arrives and begins setting up the landing sites. All radios on the ITGCN must be attended by an operator at all times in order for the LZCT to coordinate the operation wave pass over the IP. Each flight will alter its course to the proper heading bringing the flight to its prescribed landing site.

Lesson Summary. During the second lesson, you have covered the organization, preparation, and marking of the HLZ. The third lesson will cover the HLZ site report.

Lesson 3. HELICOPTER LANDING SITE REPORT

LEARNING OBJECTIVE

Given a HELLSREP format and information pertaining to one of the phonetic lines, write the appropriate encode for the information given.

4301. HLZ Subject Lines

The helicopter landing site report is one of many reports completed by recon Marines. In most cases, the preliminary information collected by the reconnaissance team should be relayed to the requesting unit as quickly as possible. The most secure method of returning this information is with the team; however, this is also the slowest method. The fastest method is by radio, but with modern direction finding equipment, lengthy transmissions may jeopardize the team's security by disclosing its location. To assist in reducing the transmission time, format messages have been developed. The following is a HELLSREP format (fig 4-19).

Alpha	Unit of measure.
Bravo	DTG.
Charlie	HLZ location.
Delta	Orientation of long axis.
Echo	Number and size of landing points.
Foxtrot	Method of deplanement.
Golf	Landing surface condition.
Hotel	Direction of approach and exit.
Juliet	Wind direction and speed.
Kilo	Approach angle for helos entering HLZ.

Fig 4-19. HELLSREP format.

Lima	Recognition aids/smoke/panels.
Mike	Landing aids angle of approach indicator/white marker lights.
November	Cloud cover.
Papa	Visibility and temperature.
Quebec	Known enemy strength and weapons.
Romeo	Position of the amphibious recon team (ART).
Sierra	Obstruction in the direction of approach and exit.
Tango	Vehicle exits from the landing site.
Uniform	Restrictions on troop movement.
Victor	Remarks. Other pertinent information.

Fig 4-19. HELLSREP format - continued.

a. HELLSREP subject lines. For ease and consistency of information, the reconnaissance of a helicopter landing site is reported by using a HELLSREP. The subject lines of the message and the serial number followed by helo landing site designation is allocated prior to the recon mission. Each subject line is explained in subparagraphs (1) through (19).

(1) ALPHA. All reports will have units of measure indicated by the below listed number code.

Unit of Measure	Number Code
Meters	1
Yards	2
Feet	3
Degrees Magnetic	4
Mils Magnetic	5
Kilometers per hour	6

Unit of Measure	Number Code
Miles per hour	7
Knots (nautical miles per hour)	8
Degrees Celsius	9
Degrees Fahrenheit	10

(2) BRAVO. DTG (date, time, group) the mission was completed.

(3) CHARLIE. Location of the HLZ. Landing site prefixed by two-letter grid zone designator when there is any possibility of uncertainty about the part of the map used.

(4) DELTA. Orientation of the long axis of the landing site.

(5) ECHO. Number and size of landing points. Size to be given as large (L), medium (M), or small (S), as briefed.

(6) FOXTROT. Method of deplanement. The following numerical codes is used:

Deplanement method	Number Code
(a) Land	1
(b) Hover	2
(c) Rope	3
(d) Rappel or winch	4

The method of deplanement is determined by the nature of the ground. Before helicopters can land, the landing point must be cleared of all obstructions which might damage wheels, skids, underbelly, or aerials. Maximum heights for deplanement methods are:

a. Hover - 6 feet	c. Rappel - 200 feet
b. Rope - 30 feet	

(7) GOLF. The landing surface should be reported in three parts. First, it should be classified as:

Surface condition	Number Code
(a) Hard. Can support the helicopter and be used by 2-wheel drive vehicles or 4-wheel drive vehicles and trailers unless heavy and continuous use is intended.	1
(b) Moderate. Can be used by 3-or-4 ton vehicles which should be able to start from using 4-wheel drive.	2
(c) Soft. 4-wheel drive vehicles cannot start from a stopped position but might cross if already on the move.	3

Second, when describing the surface in more detail, use the following format:

Surface	Letter code
1. Sand	A
2. Grass	B
3. Scrub	C
4. Snow	D
5. Ice	E
6. Marsh	F
7. Dust	G
8. Any other surface	H

Third, when the ground is covered with snow, sand, and dust, report on whether the surface will recirculate when the helicopter lands. When reporting use "Y" for yes and "N" for no. Recirculation is the effect of the downwash of the helicopter which is liable to pick up sand, dust, or snow, and blow through the rotors thereby severely reducing the pilot's visibility. This will have an adverse affect on the frequency at which helicopters can land.

(8) HOTEL. Direction of approach and exit for helicopters. Expressed in units of measurement listed in line ALPHA. The number 1 represents the direction of approach and the number 2 represents the direction of exit. Helicopters will normally land and exit into the wind, unless enemy situation or the pilot dictates otherwise.

(9) JULIET. Wind direction and speed. The wind direction is reported as the bearing from which the wind is coming.

(10) KILO. Approach angle for helicopters to take into the HLZ. The angle is dictated by the height and proximity of surrounding obstacles. The normal maximum angle of approach should be 1 to 10 feet, as shown in the diagram below (fig 4-20).

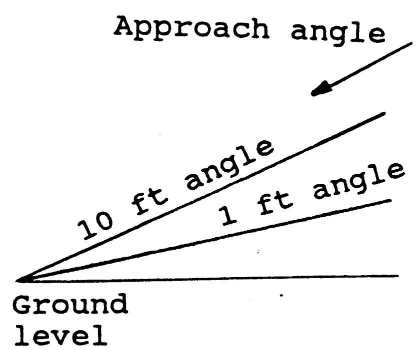


Fig 4-20. Angle of approach.

(11) LIMA. Location and recognition aids that are provided for any particular amphibious reconnaissance team (ART) must be prebriefed and allocated a number in the numerical code, for example:

Recognition aid	Number code
(a) Green smoke	1
(b) Yellow panels	2

(12) MIKE. Landing aids that are allocated in the numerical code, for example:

Landing aid	Number code
(a) Torch T	1
(b) Angle of approach indicator	2
(c) White marker lights	3

(13) NOVEMBER. Cloud cover and estimated height is reported as the proportion of the sky obscured in eights (e.g., if the sky is half covered with clouds, the number you would use is 4; for small patches of cloud cover, use the number 1). Height of the lowest cloud above the landing site is estimated in unit of measure given in line ALPHA.

(14) PAPA. Visibility and temperature is reported using measure given in line ALPHA.

(15) QUEBEC. Known enemy strength and weapons should be reported in the following way: sighting number followed by grid reference, strength, and weapons critical to the accomplishment of helicopter landings, for example:

Q1.	135684	70	2 antitank guns
2.	137592	100	

(16) ROMEO. Position of the ART if remaining adjacent to the landing zone. This is sent to avoid being mistaken for the enemy.

(17) SIERRA. Obstructions in the direction of the helicopter approach and exit are to be reported using the following letter code:

The sequence of this report is as follows: grid reference, code letter, height in unit of measure given in ALPHA. For example, S124568 B30.

Obstructions	Letter code
(a) Buildings	A
(b) Trees	B
(c) Poles	C
(d) Pylons high tension wires	D
(e) Others	E

(18) TANGO. Vehicle exits from the landing site, reported in grid reference.

(19) UNIFORM. Restrictions on troop movement. Indicate the restrictions to rapid deployment of troops from the landing site. Report by the following numerical code:

Restriction	Number code
(a) Heavy	1
(b) Moderate	2
(c) Unrestricted	3

A completed copy of the HELLSREP is illustrated on the following page.

MEANING		ENCODE
Subject line of message and serial number followed by helicopter landing site M722.26 designator; map series M722 sheet 26.		HELLSREP 2 OAK
ALPHA	Units of measurement were meters, degrees magnetic, knots and degrees fahrenheit.	A 1489
BRAVO	Reconnaissance completed 0530Z on 18th.	B180530Z
CHARLIE	Location of the four extremities of the LS are: grid references 876318, 877317, 372315, and 871316.	
DELTA	Long axis of LS is orientated 230/050	D230/050
ECHO	There is room for 3 large LP's and 1 small LP.	E3L 1S
FOXTROT	The surface of the LP's will allow the helicopters to land to deplane troops.	F1
GOLF	Surface of the LS is hard (it can support helicopters) and consists of sandy soil which is dry enough to be blown up by the helicopter.	G1 AY
HOTEL	After considering long axis, wind direction and strength, obstructions, and enemy positions, the recommended approach direction is 200 magnetic and the exit direction is 260 magnetic.	H1.200. 2.260
JULIET	Wind is blowing from 200 magnetic, strength is 30 knots.	J200.30
KILO	Obstacles on recommended approach path dictate a minimum approach angle of 1 in 15.	K1 IN 15
LIMA	Of the briefed location and recognition aids carried by the ART which were allocated code numbers: Green smoke 1 Yellow panels 2	L 1.2
MIKE	Of the briefed landing aids carried by the ART which were allocated the code number: Torch T 1 AAI 2 White marker lights 3	M1.2

Fig 4-21. Helicopter landing site report.

NOVEMBER	The sky is half covered by cloud (4/8th) which is estimated as being 200 meters above the LS.	N4.200
PAPA	Visibility is 5 kilometers, temperature minus 2 degrees centigrade.	P5000 2
QUEBEC	Enemy have been observed in three locations as follows: approximately 100 men with two antitank guns at grid 856331, approximately 80 men at 840275, and three tanks at 863325.	Q856331. 2 Anti tanks 2. 840275.80 3.863325.3 tanks
ROMEO	As elements of the ART are remaining close to the LS, their position is reported as grid reference 877316.	R877316
SIERRA	A set of pylons and high tension wires 30 meters high cross the approach, 1 kilometer away. There are also some trees 15 meters one half kilometer away.	S879328D30 878318B15
TANGO	Clear exits for vehicles at grid reference 872315 and 876318.	T872315. 876318
UNIFORM	The terrain will tend to restrict the movement of troops from the LS.	U2
VICTOR	The ART reports that a bald hill at hill grid reference 886316 is landmark to 886316 the landing zone.	V. Bald

Fig 4-21. Helicopter landing site report--continued.

b. Helicopter communications. Remember these three things when signaling or communicating with helicopters:

(1) When smoke is being used as a location aid for the helicopters, the ART should indicate when the smoke is being released, but not the color. The pilot of the lead helicopter should read back the color seen and the ART confirm that the correct color has been spotted.

(2) A waveoff signal should be prebriefed before the ART deploys in the event of the landing site being compromised immediately prior to the helicopter landing.

(3) Helicopters can easily be deceived by the enemy unless prebriefed recognition signals are used by the ART manning the landing site.

Unit Exercise: Complete items 1 through 20 by performing the action required. Check your responses against those listed at the end of this study unit.

1. Identify the five possible missions an ITG team can perform.

    a. Provide landing assistance and limited traffic control for helos, provide ITG, provide pre-H hour reports on enemy activities, prepare the HLZ for ITG operations, and conduct terrain recon in the vicinity of the HLZ.

    b. Give assistance to helos, provide ITG, call for naval gunfire, prepare the HLZ for ITG operations, and provide data on the security of the area.

    c. Conduct terrain recon, provide pre-H hour reports, provide Marines for battalion blocking positions, assist line units in the establishment of defensive positions, and call for naval gunfire.

    d. Provide landing assistance and limited traffic control for helo, call for naval gunfire, assist line units in the establishment of defensive positions, provide pre-H hour reports, and give assistance to helos.

2. Identify the different methods of insertions for an ITG team.

    a. Parachute, helicopter, landing craft, SPIE, rubber boat, and swim
    b. Helicopter, landing craft, parachute, glider, rubber boat, and helicast
    c. SPIE, glider, helicopter, infiltration, rubber boat, and parachute
    d. Infiltration, landing craft, helicopter, motor vehicle, parachute, and rubber boat

Matching: For items 3 through 11, match the ITG terminology in column 1 to its definition in column 2. Place your responses in the spaces provided. Selections in column 2 may not be used more than once.

Column 1

Terminology

____3. HLZ
____4. HLA
____5. Helicopter wave
____6. Landing site
____7. Terminal guidance
____8. ITG
____9. Initial point
____10. LZCT
____11. HST

Column 2

Definition

a. Phase of terminal guidance normally pre-H-hour, during which assistance is given to the pilots of leading helo waves
b. One or more helos grouped under a single leader and scheduled to land in the same HLZ approximately at the same time
c. An area within a landing zone where waves, flights, or flight increments of helicopters will land
d. Any electronic, mechanical, visual, or other assistance given to helo pilots to facilitate arrival to an HLZ
e. An area in which a heloborne assault will be landed; made up of one or more HLZs
f. A specific ground area used for landing a helo force
g. Serves as an air central point within a 2-mile radius of the landing zone from which individual flights of helos are directed
h. Establishes communications with inbound helicopters and controls the HLZ during ITG missions
i. Loads and unloads helos, emplaces and operates navigational aids, and participates in local security

12. Identify the organization of an ITG team.

    a. Traffic control station, landing control center, security team
    b. Security team, traffic control station, and initial point party
    c. Landing zone control team, landing site team, and the security team
    d. Landing zone control center, initial point party, and assault element

13. State the five priorities of work when preparing an HLZ.

____

____

____

____

____

14. Your team's mission is to provide evening ITG for inbound helos. After jumping into the DZ and establishing security, you learn that the helicopter unit has specified that the aircraft will be initiating the approach from 500 feet above ground level. Select the appropriate method for marking the HLZ.

    a. Inverted "Y"
    b. Lighted "Y"
    c. Standard "Y"
    d. Landing "T"

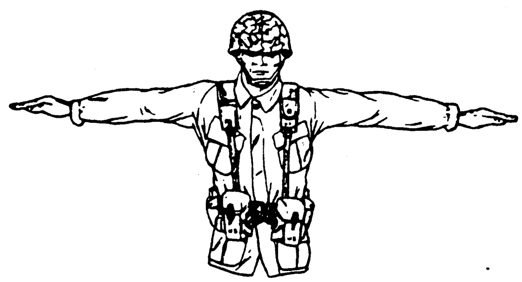
<u>Matching</u>: For items 15 through 19, match the LSE name in column 1 with the appropriate illustration. Place your responses in the spaces provided.

Column 1

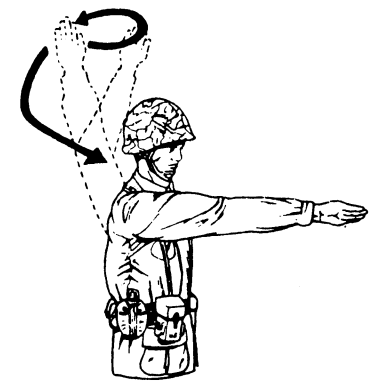
<u>LSE signals</u>

_____15. Prepare for guidance
_____16. Hover
_____17. Wave off
_____18. Take off
_____19. Land

a.



c.



b.

d.

e.

20. You are in the process of filling out a helicopter landing site report (HELLSREP). The landing site is moderate with a sandy surface which is dry enough to be blown around by the helicopter. Using the HELLSREP format below and the information provided, select the appropriate encode for the surface of the landing site.

a. G2 AG
b. G2 AY
c. G2 LK
d. G2 AN

GOLF <u>LS Surface</u>. Should be reported in three parts. First, it should be classified as:

	Number Code
<u>Hard</u>: Can support the helicopter and be used by 2-wheel drive vehicles or 4-wheel drive vehicles and trailers, unless heavy and continuous use is intended.	1
<u>Moderate</u>: Can be used by 3- or 4- ton vehicles which should be able to start from rest using 4 wheel drive.	2
<u>Soft</u>: 4-wheel drive vehicles cannot start from rest, but might cross if already on the move.	3

The surface should then be described as:

	Letter Code
Sand	A
Grass	B
Scrub	C
Snow	D
Ice	E
Marsh	F
Dust	G
Any other surface	H

When ground is covered by snow, additionally report subsurface. It should be reported whether the surface will recirculate, reporting Y for yes and N for no. Recirculation is the effect of the downwash of the helicopter which is liable to pick up sand, dust, or snow, and blow through the rotors thereby severely reducing the pilot's visibility. This will have an effect on the frequency at which helicopter can land.

<u>NOTE</u>: Wind speed at ground level at the periphery of a helicopter's rotors can be in excess of 60 knot; e.g., hard surface of snow covered grass, the snow is liable to recirculate - G1 BD Y.

HELLSREP format.

UNIT SUMMARY

This study unit provided you with information on the ITG terminology, organization, and missions. You also learned how to prepare and mark landing sites and to complete the HELLSREP. As mentioned in the study unit, there are different ways of conducting ITG. As recon Marines, you may be expected to perform the task of ITG with as few as 3 or 4 Marines.

Study Unit 4 Exercise Solutions

		Reference
1.	a.	4101a
2.	d.	4101b
3.	f.	4102
4.	e.	4102
5.	d.	4102
6.	c.	4102
7.	d.	4102
8.	a.	4102
9.	g.	4102
10.	h.	4102
11.	i.	4102
12.	c.	4201a
13.	Establish and maintain security. Erect and place in operation all radios. Prepare the helicopter landing sites. Erect all visual and navigational aids. Prepare and mark troop assembly areas.	4202a
14.	d.	4202d
15.	d.	4203b
16.	a.	4203b
17.	b.	4203b
18.	c.	4203b
19.	e.	4203b
20.	b.	4301a

STUDY UNIT 5

AMPHIBIOUS RECONNAISSANCE MISSIONS

Introduction. Regardless of whether an amphibious operation is the size of the Allied invasion on the beaches of Normandy during WWII or the size of the invasion on Grenada in 1983, an amphibious landing requires a great deal of intelligence information. Information about the enemy strengths, weaknesses, obstacles, and size and depth of the landing beaches is essential information needed prior to the actual landing of an amphibious force. The mission to obtain this information is not an easy task. Often there are miles of beach to reconnoiter. The task of completing an amphibious mission from the warning order to the debriefing of the patrol would be a course in itself. The Marine reconnaissance unit is not the only team trained to perform this mission. Very often Navy Seals work hand in hand with Marine units to accomplish the task. During this study unit, you will learn about the amphibious jobs performed by reconnaissance Marines and about the various reports that accompany each task. Some of these reports are long and detailed. You do not need to memorize the reports themselves, but you do need to become very familiar with the use of encoding the subject lines.

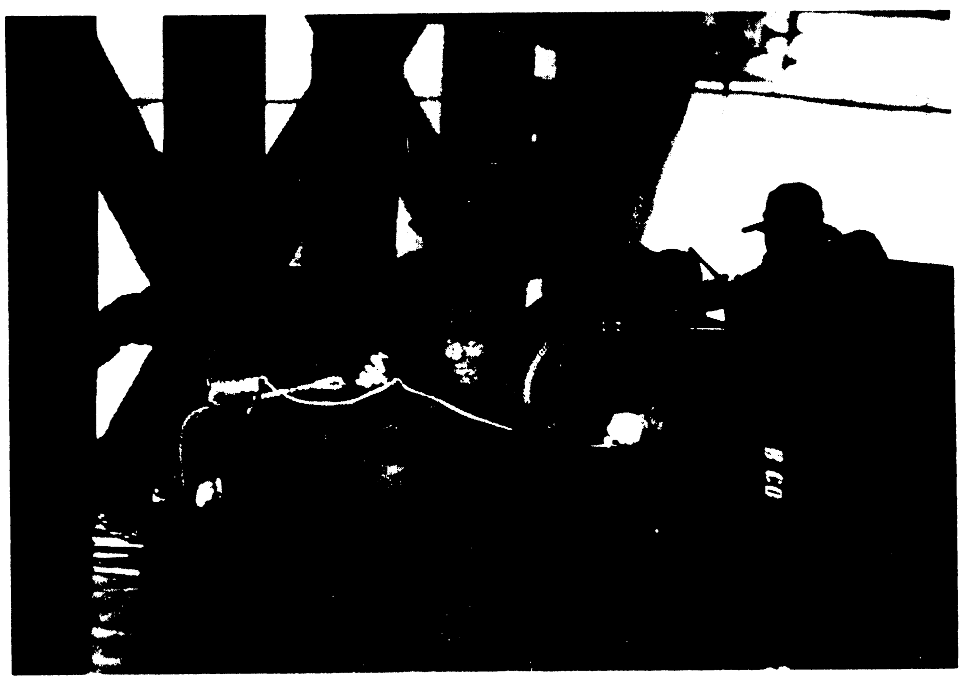


Fig 5-1. Reconnaissance Marines on mission.

Lesson 1. AMPHIBIOUS MISSIONS

LEARNING OBJECTIVES

1. List the four types of information collected by reconnaissance teams for the preassault portion of an amphibious operation.

2. Identify the purpose of a reconnaissance area of operation.

3. List the three elements of a beach survey report.

5101. Preassault Operations

The principal ingredient of any successful reconnaissance mission is continuous, careful, and detailed planning. When performing reconnaissance missions, the overall effort should be focused on collecting important intelligence data which will assist the planning of an amphibious operation. In preassault operations, the reconnaissance missions concentrate initially on coastal areas. Prior to learning the various amphibious missions and the reports that accompany each mission, you need to understand the meaning of the following amphibious terms used:

TERM	DEFINITION
Offshore	Starts at approximately a 30-ft depth away from the beach and continues into deeper water.
Nearshore	Starts at approximately a 30-ft depth away from the beach and continues toward the beach where the water hits the shore at low tide.
Foreshore	From where the water hits the beach at low tide to the point on the beach where the water reaches high tide.
Sounding	A nautical term used to measure depth of water, expressed in feet.
Fathom	A nautical term used to designate a a distance of 6 feet.
Gradient	The slope of the beach.

TERM	DEFINITION
Datum point	A fixed location designated by an object or an 8 digit grid. Used as a point of reference for illustrating and marking sounding lines.
Datum plane	The area where the water hits the beach at low tide.
Scarps	Backside of a wave.
Trough	The bottom area of the wave before the wave actually spills over.
Littoral drift	The speed of the current moving generally parallel and adjacent to the shoreline.
Breaker	Nautical term used for waves.

Now that you have a general understanding of some the terms used in amphibious missions, let's move on to the preassault missions.

a. <u>Preassault missions</u>. Preassault missions are performed to collect data about the area in which a major force will be landed. The information needed by higher headquarters will be covered in the various reports given by the team who conducted that mission. Often, reconnaissance teams will verify information already obtained by other sources (SEAL teams or photographs). After performing the preassault mission, the recon team may withdraw seaward or move inland for extraction. The four types of intelligence information collected on the preassault mission are as follows:

(1) <u>Hydrographic information</u>. If the Navy's Sea, Air, Land (SEALs) teams are not available to perform the mission, the reconnaissance team may perform the task. The information the team will collect may include:

(a) Depth of the water, out to 3 fathoms

(b) Nature of sea bottom

(c) Nature of surf

(d) Nature of currents

(e) Location of reefs, sandbars, seaweed, or manmade obstacles.

(2) Beach description. This information will generally include:

(a) Geographic location of the beach

(b) Extent of the beach

(c) Composition and consistency

(d) Gradient of the beach

(e) Natural or manmade obstacles

(f) Exit routes off the beach

(g) Dispersal and storage areas

(h) Inland limit of beach

(3) Inland terrain description. Information collected on the terrain inland of and adjacent to the beach may include:

(a) Critical terrain features

(b) Landmarks visible from seaward

(c) Natural or manmade obstacles

(d) Movement routes

(4) Enemy defenses. Reconnaissance of enemy defenses may cover the immediate beach area, inland terrain, and defenses adjacent to the beach. Information collected may include:

(a) Location of coastal defense guns, antiboat guns, and crew-served weapons

(b) Troop locations and fortifications

(c) Security outposts

(d) Natural and manmade obstacles

(e) Artillery, missile, and mortar positions

(f) Locations of reserves

(g) Air defense systems

Now that you have covered preassault operation, let's review. What are the four types of intelligence information collected by reconnaissance teams for the preassault portion of an amphibious operation?

(1)____

(2)____

(3)____

(4)____

The correct answers are hydrographic information, beach description, inland terrain description and enemy defenses.

5102. Reconnaissance Area of Operation (RAO)

Reconnaissance units, without exception, are given a reconnaissance area of operation (RAO). Recon units are employed in small, widely separated teams operating in areas which are not in close proximity to friendly units. This employment concept means that the methods used to designate operational areas for ground combat units are not readily adaptable for use by reconnaissance units.

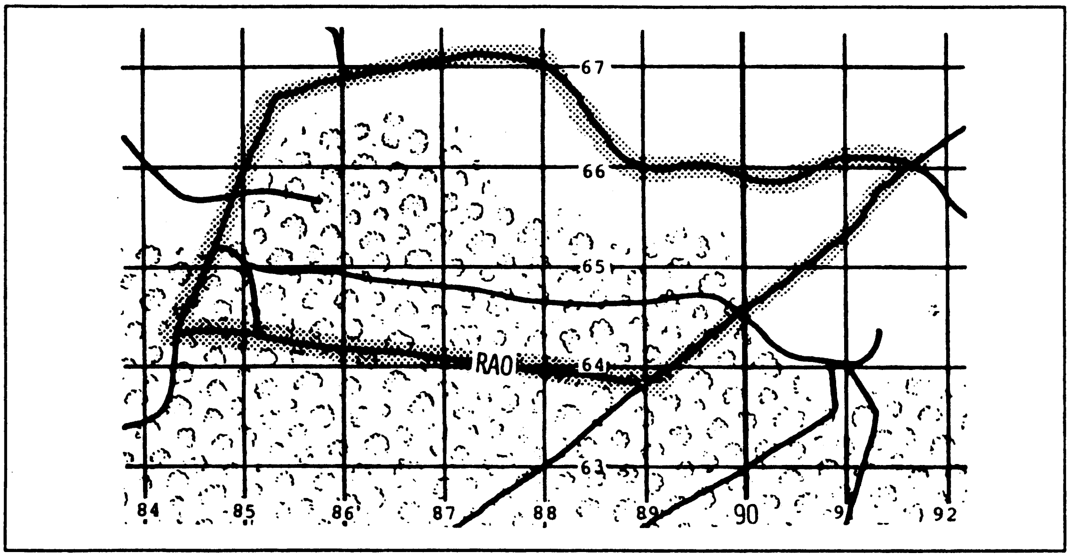
a. <u>Reconnaissance area of operation (RAO)</u>. The RAO is established to identify reconnaissance operational areas. In terms of fire support, the RAO is a permissive fire support control measure. This area functions exactly like a tactical area of responsibility (TAOR). The reconnaissance team inside the RAO may fire on any target within the RAO without outside coordination or approval. No outside fire support agency may fire inside the RAO without approval of the reconnaissance team inside the RAO. An RAO is large enough to provide a 1000 meter safety zone on all sides of the team and its patrol route. Because friendly units are usually not near a team, the need to place the RAO boundaries on recognizable terrain features usually does not exist. As a result, the RAO is usually square or rectangular in shape for ease of control. However, there may be circumstances where recognizable terrain features are used as boundaries of the RAO because of the proximity of other reconnaissance teams or other friendly forces.

b. RAO boundary. Figures 5-2 through 5-4 illustrate examples of the RAO as well as how the RAO can be designated by message. Additional information such as the RAO number, team call sign, radio frequency, and duration of the patrol can be placed on the situation maps. Use of locally assigned RAO numbers permits unclassified reference to a specific area. There are basically three different methods of using the RAO:

(1) To designate an area for a road recon

(2) When boundaries are not placed on recognizable terrain features

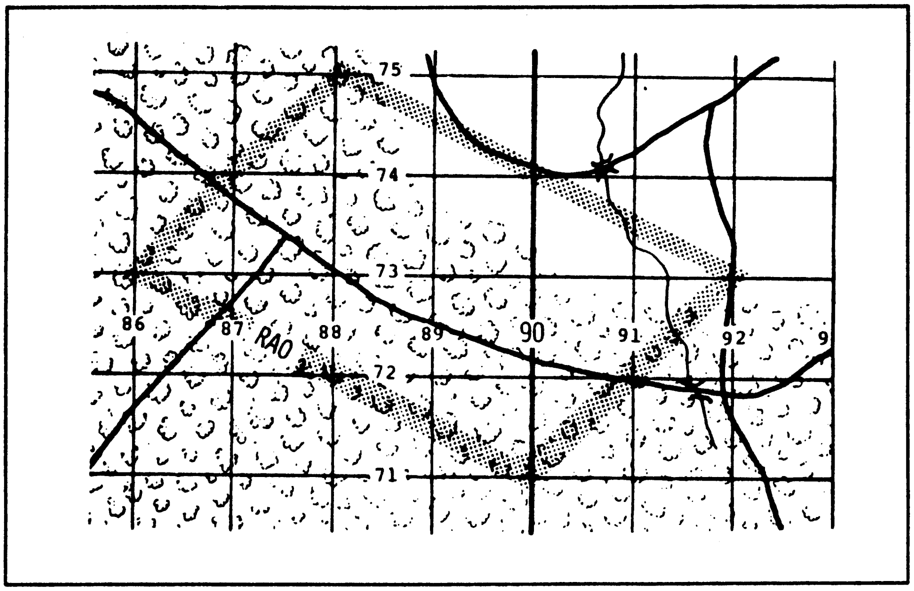
(3) When the boundary is placed on recognizable terrain features



Designation Message

RAO No.	Location
106	918660 W along RD to 853667 SW along RD to 843643 E along road to 890638 NE along road to 918660

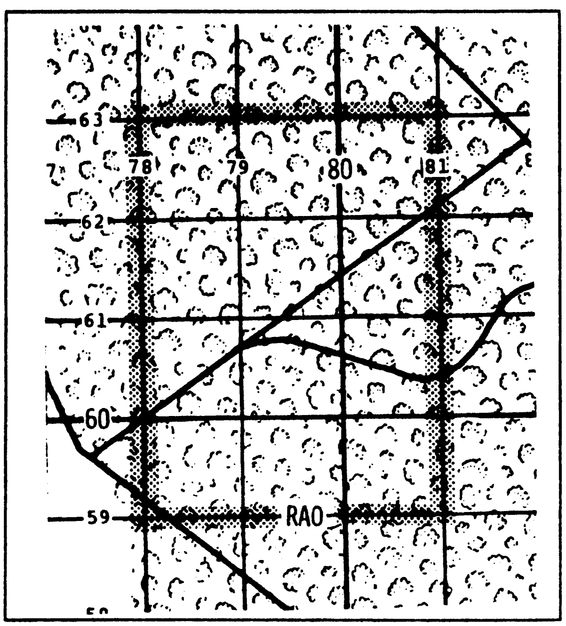
Fig 5-2. RAO using recognizable terrain features.



Designation Message

RAO No.	Location
107	FM 8673 to 9071 to 9273 to 8875 to 8673

Fig 5-3. RAO to designate a road recon.



Designation Message

RAO No.	Location
108	UL 7863 LR 8159

Note: UL is upper left
LR is lower right

Fig 5-4. RAO not using recognizable terrain features.

5103. Beach Survey

There are many different types of amphibious missions performed by reconnaissance Marines. A beach must meet certain requirements prior to a unit conducting operations on it. The recon team's mission is to gather that information to ensure the beach has those requirements. One tool used to help gather this information is the beach survey report. This report lets the team know what information is needed and helps keep track of the information obtained.

a. General. A beach is defined as a strip of sand, pebbles, or other similar material extending from the line of extreme low water inland to the coastline. Figure 5-5 is a general beach profile diagram which illustrates the physical characteristics of a beach. The beach survey is usually defined as an area whose boundaries are a shoreline, a coastline, and two natural or arbitrarily assigned flanks. The survey involves the collection of data describing the physical characteristics of a beach.

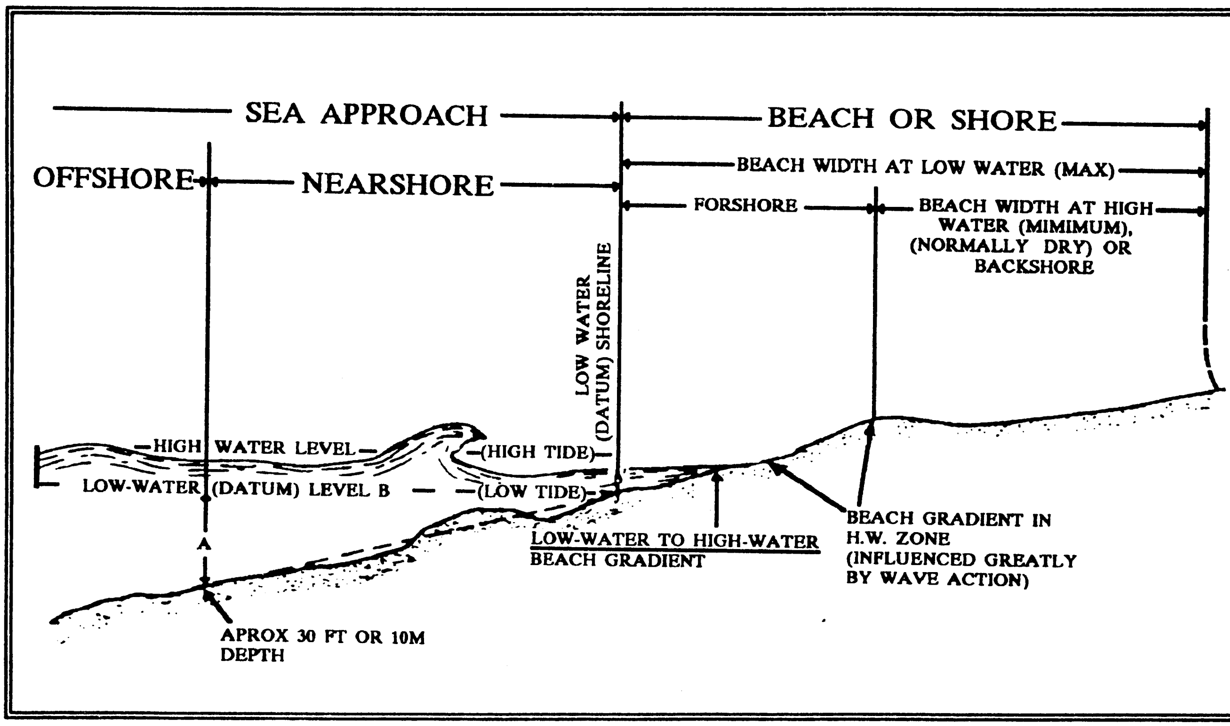


Fig 5-5. General beach profile diagram.

b. Beach survey mission. The beach survey can be conducted openly or clandestinely. As a member of a recon team, you will normally conduct clandestine surveys. After making an overall study of long stretches of coastline for the purpose of selecting suitable landing beaches for an amphibious operation, higher headquarters may direct reconnaissance teams to conduct surveys of specific beaches in order to collect or verify information about the beach and the enemy on the beach. Higher headquarters can determine how a beach will effect an amphibious landing and decide which beaches will be used for the actual landing. Physical reconnaissance of beach areas by the reconnaissance teams is the most positive and reliable source of information available to amphibious planners.

c. Beach Survey Report. The Beach Survey Report (BEACHREP) is a written account of your findings. The report has three elements which are the heading, the beach description, and the observed enemy situation. The format for the Beach Survey Report shown on the following page (fig 5-6) should be used. The report may be accompanied by sketches, overlays, annotated charts, photographs, exposed film, soil, and vegetation samples.

BEACH SURVEY REPORT
(BEACHREP)

1. HEADING

A. Date report submitted ____________ B. Unit making survey ____________

C. Identity and location of beach surveyed.

(1) Reference maps or charts ____________
(2) Designation or name of beach ____________
(3) Coordinates of the beach flanks ____________
(4) Landmarks and their position relative to center of beach ____________

D. DTG Survey started ______ E. DTG Survey completed ____________

F. Datum plane (Used to determine shoreline) ____________

G. Conditions during survey (weather, visibility, enemy activity) ____________

2. BEACH DESCRIPTION

H. Beach length and configuration ____ I. Usable beach length ____________

J. Beach interruptions and obstacles ______ K. Type coastline ____________

L. Foreshore description (1) Width _____ (2) Gradient ____________

(3) Composition ____________

M. Backshore description (1) Width _____ (2) Gradient ____________

(3) Composition ____________

(4) Vegetation ______ (5) Exits ____________

N. Hinterland description ____________

3. OBSERVED ENEMY SITUATION

REMARKS: (Include photos, sketches, samples)

Submitted by

____

Name/Rank/Team name/Organization

Fig 5-6. Beach Survey Report.

The items of information shown in figure 5-6 are not self-explanatory. The information is explained in detail in subparagraphs (1) through (13).

ELEMENT ONE. The HEADING of the survey report will encompass letters A through G.

(1) Line A, Date report submitted. Self explanatory.

(2) Line B, Unit making survey. Give the name of your unit.

(3) Line C, Identity and location of beach surveyed. Operation planners assign a code name to each beach of interest to identify the beach, to avoid confusion, and for ease of later reference. In addition to the name of the beach, the beach is further identified by giving the grid coordinates of the flanks of the beach. The shoreline (extreme low water mark) and the coastline (limit of action of normal storm waves) are two natural boundaries of any beach. The flank boundaries may be natural boundaries or arbitrary boundaries assigned by higher headquarters. Landmarks on the beach which can be used to help identify the beach from a boat in the offshore approach are described. The location of landmarks in relation to the center of the beach is given.

(4) Line D, and E, DTG survey started/completed. It is important to include the time period during which the beach survey was started and completed. The survey period should include a period of low water so that the foreshore can be reconnoitered.

(5) Line F, Datum plane. The datum plane is used to determine the shoreline. This will normally be the low water stage of the tide. It is the plane or level to which the sounding on a chart is referred to.

(6) Line G, Conditions during survey. State what the weather, visibility along the beach, and enemy activity around the area were at the time of the survey.

ELEMENT TWO. In the <u>BEACH DESCRIPTION</u> portion of the report, lines H through N are covered.

(7) <u>Line H, Beach length and configuration, and Line I, Usable beach length</u>. The beach length is the distance along the beach at the water's edge at high and low water levels. Usable beach length is the length of the beach less those areas which present obstacles which would hinder the landing of troops, vehicles, and supplies. The beach length is measured by using a tape measure or pacing. For the purpose of the beach survey, the beach is classified as one of three shapes: straight, concave, or convex.

(8) <u>Line J, Beach interruptions and obstacles</u>. Beach interruptions are areas with obstacles that would hinder the landing. The length of interruptions measured along the beach and the types of interruptions are reported. Obstacles <u>on the beach</u> include all obstacles, manmade or natural, between the low water line and the coastline that hinder foot and vehicular traffic across the beach. Obstacles <u>in the approach to the beach from the sea</u> include all obstacles, manmade or natural, that hinder the movement of landing craft to the beach. Such obstacles reported in the beach survey are normally limited to those visible from the beach. Location and description of underwater obstacles are best determined during a hydrographic survey which will be discussed later.

(9) <u>Line K, Coastline type</u>. The coastline is marked by the limit of normal storm waves and is classified as cliffs, dune, or plain.

(10) <u>Line L, Foreshore description</u>. The foreshore is part of the shore or beach lying between the extreme low water line and the upper limit of normal waves. The width of the foreshore is the horizontal distance from the low water line to the upper limit of normal waves. Beach gradients have an important effect on landing craft and are classified in the following chart.

Note: 1:120 means that the gradient of the beach falls 1 foot vertically for every 120 feet horizontal distance.	
Beach gradients	Classification
(a) Flat	Less than 1:120
(b) Mild	1:120 to 1:60
(c) Gentle	1:60 to 1:30
(d) Moderate	1:30 to 1:15
(e) Steep	More than 1:15

The composition of the foreshore refers to the type of surface materials that make up the beach. They are classified as silt, mud, boulders, rock, coral, or any combination of these. Representative samples of the beach surface materials should be taken at regular intervals along the foreshore and should supplement the report. Sand and gravel are ideal for beaching landing craft.

(11) Line M, Backshore description. The width of the backshore is measured from the upper limit of normal wave action inland to the extreme limit of storm wave action. The gradient and composition of the backshore are reported in the same manner as those of the foreshore. The backshore is normally dry since it is acted upon only by storm waves; vegetation is often found growing there.

Vegetation on the backshore is reported as to what type, density of growth, and height. Exits from the beach include any natural or artificial feature of the terrain that may be used for movement of troops and vehicles from the beach to the coastal terrain. Beach exits are reported as to their type (troop or vehicular) and location in relation to the center of the beach.

(12) Line N, Hinterland description. The hinterland is the area from the back of the beach to a distance of 5 miles inland. The hinterland is described in terms of the four aspects of topography; i.e, relief and drainage, vegetation, cultural features, and surface materials.

ELEMENT THREE. The OBSERVED ENEMY SITUATION element covers information concerning the enemy.

(13) Section 3, Observed enemy situation. A reconnaissance conducted to obtain information about the enemy on or near the beach is not a beach survey. However, such information about the enemy which may have been collected during the beach survey is included in the beach survey report. This section should include a precise report of all manmade objects on the beach, whether or not they were obviously erected as part of a beach defense. The reports of enemy defenses and activities are not limited to those occurring on the beach itself but should include all such defenses and activities observed near the beach.

Now that you have covered the beach survey report, let's review. What are the three elements of a beach survey report?

(1) ______________________________________

(2) ______________________________________

(3) ______________________________________

The correct answers are heading, beach description, and the observed enemy situation.

Lesson Summary. During this lesson you have covered preassault information gathering, reconnaissance area of operations, and the beach survey report. During the next lesson you will cover hydrographic surveys.

Lesson 2. HYDROGRAPHIC SURVEYS

LEARNING OBJECTIVES

1. Identify the three sections of a hydrographic survey.

2. Match the specified information in a surf report to the correct phonetically marked format code.

3. Given a specified part of the confirmatory beach report (CONBEREP), match the letter code with the appropriate trafficability code.

5201. Hydrographic Survey

Hydrography is the study and description of bodies of water. Hydrographic surveys are used in amphibious operations to describe the sea and marginal land areas and to describe the effects of these in such operations.

a. Hydrographic mission. The purpose of hydrographic mission is to collect information about the area in which the landing craft will land to disembark troops. This area consists of the foreshore and the nearshore sea approach. A hydrographic survey and a beach survey overlap in that they both involve the collection of data relating to the foreshore area. The survey may be conducted openly or clandestinely. When reconnaissance Marines are used, they are normally involved only in clandestine surveys. They collect and verify any or all descriptive data. Hydrographic surveys are usually conducted by SEALs but may be assigned to a Marine reconnaissance unit when a SEAL team is not available.

b. Hydrographic survey report. A hydrographic survey report may be submitted by message or by written report depending largely upon the urgency of the situation and the distance between the headquarters requiring the information and the reconnaissance unit that conducted the mission. A hydrographic sketch will be prepared in nearly all cases and the written report may be accompanied by other overlays and photographs. The samples of foreshore and nearshore approaches are appended to amplify the information contained in the report. The hydrographic sketch is a scale of the nearshore and foreshore areas as seen from above looking down.

The written hydrographic survey report contains three sections: the heading, hydrographic description, and observed enemy situation. This report will always be accompanied by a hydrographic sketch. These sections will be prepared according to the information on the following page:

SECTION	HYDROGRAPHIC SURVEY REPORT
Heading	The heading contains miscellaneous data which is used by the requester to evaluate the information contained in the remainder of the report. • DTG • Identity of the reporting unit • Mission assigned to the unit conducting the survey • Identity and location of the area surveyed
Hydrographic description	The hydrographic description section with the hydrographic sketch contains data used to evaluate the suitability of a beach for an amphibious landing. It must be detailed and precise. Descriptive data includes: • <u>Beach dimensions</u>. Beach configuration, surf characteristics, currents, and tidal ranges are covered. • <u>Nearshore description</u>. Beach gradient, bottom composition, reefs, bars, and other obstacles are covered. • <u>Foreshore description</u>. Beach width, gradient, and other obstacles are covered.
Observed enemy situation	The enemy situation section contains all information about the enemy collected during the hydrographic survey. This section contains a precise report of all manmade objects in the area surveyed whether or not such objects were obviously erected as part of a beach defense and a report of enemy defenses and activities observed.

Now that you have covered the hydrographic survey, let's review. What are the three sections of a hydrographic survey?

(1)__________________________________

(2)__________________________________

(3)__________________________________

The correct answers are the heading, hydrographic description, and the observed enemy situation.

5202. Surf Report (SURFREP)

Surf conditions on the landing beaches are among the most critical items of information required by the commanders of the landing force and amphibious task force. The only way in which information can be collected effectively at the present time is to actually put reconnaissance teams on the landing beaches to observe the surf.

a. Surf report mission. A surf report involves the collection of data describing the physical characteristics of the surf off a particular beach. Although surf reports are normally done by SEALs, such tasks may be assigned to reconnaissance teams. Since a single surf observation is of little value, a series of observations is usually made. The period between observations usually decreases as H-hour approaches.

b. Surf report format. The surf report format once coded is used to send radio transmissions. The report is submitted to the debriefing personnel at the conclusion of the patrol. The format itself is slightly longer than the previous report formats covered. Therefore the following subparagraphs are covered in detail prior to showing you the entire report.

(1) ALPHA. Units of measure used. The following selection will be used throughout:

Units of Measure	Number code
(a) Meters	1
(b) Yards	2
(c) Feet	3
(d) Degrees (magnetic)	4
(e) Mils (magnetic)	5

Units of Measure	Number code
(f) Kilometers per hour	6
(g) Miles per hour	7
(h) Knots per hour	8
(i) Degrees Celsius	9
(j) Degrees Fahrenheit	10
NOTE: The above chart pertaining to line alpha will be used for the remaining reports in this course.	

Only those numbers used in the surf report are stated on line A. Only one unit of measure for each type of measurement should be specified on line A. For example, either 1, 2, or 3, but not both 2 and 3. It is essential not to use a unit of measure that is different from the specified units of measure. The unit of measure must be stated each time it is used in the text.

(2) BRAVO. The date, time, group (DTG) surf observation was completed.

(3) CHARLIE. The average height of all breakers, observed in a 10-minute period. Expressed to the nearest 1/2 foot or 1/10 meter.

(4) DELTA. The largest breaker observed expressed in the unit of measure as shown on line A.

(5) ECHO. The time in seconds between breakers to the nearest 1/2 second.

(6) FOXTROT. The number of each type of wave followed by the letter code of that type of wave as indicated in the chart on the following page:

Wave type	Letter code
(a) Spilling. The wave becomes unstable at the crest and forms white water at the crest. The white water (foam) expands slowly down the front face of the breaker. Breaking action is mild.	A
(b) Plunging. The wave crest advances so much faster than the base of the wave that it almost falls into the trough with a violent action. The foam appears almost instantly over the complete front. At times air is caught in the breaker as it tumbles forward creating a type of explosion.	B
(c) Surging. The wave crest tends to advance faster than the base of the wave suggesting the formation of a plunging breaker. However, just before breaking completely, the wave base advances faster than the crest and the plunging is arrested. These are generally found at steep gradients.	C

(7) GOLF. The acute angle that is formed between the breaker lines and the shoreline expressed to the nearest 5 degrees. The breaker direction is the right or left direction in which the breaker moves toward the observer facing the sea. The direction is expressed as R (right) or L (left).

(8) HOTEL. The speed of the current moving generally parallel and adjacent to the shoreline (littoral current) is expressed in the velocity unit of measure shown on line A. This number is followed by the letter R (right) or L (left) to indicate the direction this current is flowing as seen by an observer facing the sea.

(9) JULIET. This is the number of well-defined breaker lines in the surf zone and the width of the surf zone using the length unit of measure specified on line A. The width is the distance from the outermost breaker to the extreme uprush of water on the beach.

(10) KILO. Any special factors which could affect the above report should be included.

Number-letter codes are used in many of the reports as a means of qualification or description. In cases where the observer is uncertain as to which single letter or number he should send, he may send two numbers/letters in order to show a compromise or halfway condition. For example, after observing waves, you note that they are the spilling and plunging type. Wave types are listed on line Foxtrot, and spilling is sublisted as (A) and plunging is sublisted as (B). In this case you would send over the radio F-A/B. An example of a surf report is shown below.

SURF REPORT (SURFREP)

MEANING		ENCODE
Subject line of message, serial number, and beach code name.		SURFREP 4 RED 1
ALPHA	Units of measure used are meters, knots per hour, and degrees magnetic.	A148
BRAVO	The surf observation was completed at 071930Z.	B071930Z
CHARLIE	The average height was 1 1/2 meters.	C1 point 5
DELTA	The largest breaker was 2 meters high.	D2
ECHO	The average time between breakers was 9 1/2 seconds.	E9 point 5
FOXTROT	Sixty spilling breakers were observed and 40 plunging ones.	F60A 40B
GOLF	The angle observed was 35 magnetic right.	G35R
HOTEL	The littoral current was produced by a a current flowing at four-tenths knot with a set to the left.	H0 point 4L
JULIET	Six well defined lines of breakers were observed in a surf zone 200 meters wide.	J6.200
KILO	A northeast wind was building up to 30 knots. Visibility was reduced to 75 meters.	K. NE WIND INCREASING 30. REDUCED VISIBILITY 75

Fig 5-7. Surf Report.

Now that you have covered the surf report, let's review. Next to the phonetic line below, list the information that belongs with that line.

Alpha ____

Bravo ____

Charlie ____

Delta ____

The correct answers are a type of measurement used, DTG, significant height of breakers in a 10-minute period, and maximum breaker height.

5203. Confirmatory Beach Reconnaissance Report (CONBEREP)

The detailed beach and hydrographic surveys which were previously discussed are not really tactical evaluations for Marine Corps reconnaissance units. These operations are for the most part deliberate and overt in practice and are assigned to recon units by default when other units with specialized training and equipment are not available. Usually in a tactical operation, Marine Corps reconnaissance units are used to confirm information already available.

a. <u>Confirmatory beach report mission</u>. Confirmatory beach report missions are performed specifically to CONFIRM information already existing about a specified beach. These missions are performed by the reconnaissance units.

b. <u>CONBEREP report format</u>. A confirmatory beach reconnaissance mission is assigned immediately prior to H-hour. The following subparagraphs offer a detailed description of a CONBEREP.

(1) <u>ALPHA</u>. The units of measure used.

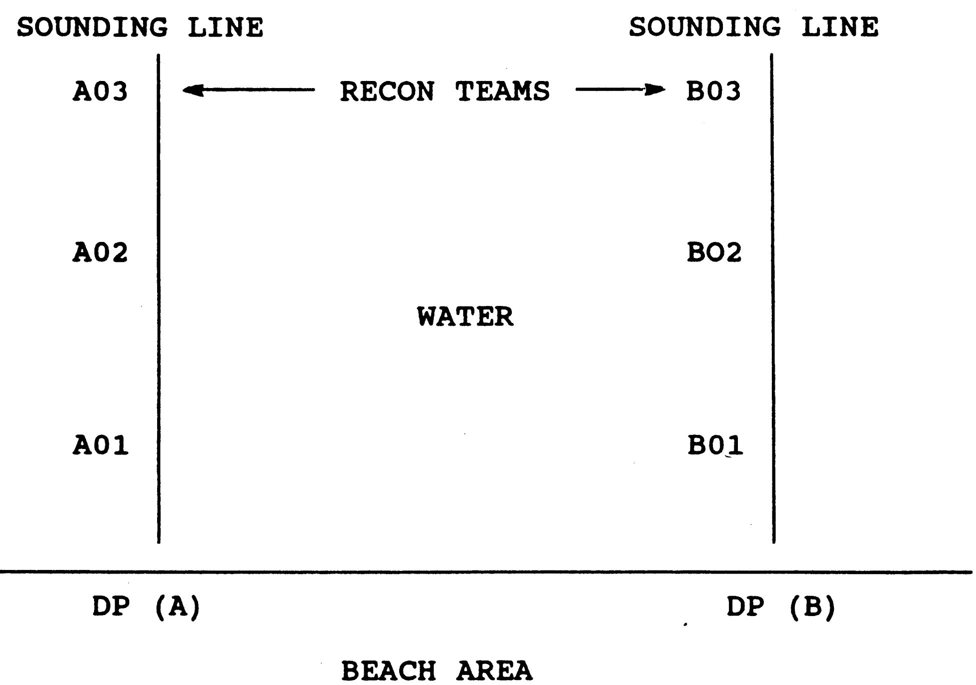
(2) <u>BRAVO</u>. Include any offshore obstructions showing above the water at low tide. Describe the obstacle and give its position using grid references or bearing and ranges from known landmarks or charted reference points.

(3) <u>CHARLIE</u>. When the littoral current differs significantly in velocity or direction from earlier estimations, indicate the new velocity in knots to the nearest tenth of a knot which equals approximately 100 feet per minute. Direction of current flow is expressed as to the left or right as viewed facing the sea.

(4) DELTA. Include datum points, which are fixed positions to which sounding lines are related. The existing situation will dictate whether one or more datum points will be required. Datum points should be designated by grid reference.

(5) ECHO. Include the sounding interval, which gives the difference between each sounding on a sounding line. The sounding interval may be varied by particular units, specified conditions, or CATF requirements.

(6) FOXTROT. The sounding line designation consists of three characters. The first character is the letter designating the datum point or DP's to which the sounding line is related i.e. A, B, and so on. The second and third characters are two-digit numerals that designate the sequential number of recon team positions along the sounding line; for example, A01, A02, A03, B01, B02, B03 as illustrated below.



An example of an encoded message would read F-A01, followed by the measurement in fathoms or soundings. The F-indicates the line number of the report, the A indicates the datum point of that sounding line, and 01 representing the position of the recon team along the sounding line, which in this case 01 is the first team. If the second sounding line has a different datum point, then the first letter would read B, and so on. Sections A-E provide the following information:

(a) Locates the waterline at the time of sounding (WLTS) in relation to the applicable DP and is expressed as bearing and range from DP. The DP will always be on the bearing of the first sounding line.

(b) Bearing of the sounding line as viewed facing the sea.

(c) Date-time group, the month and year are not required.

(d) Indicates the distance (in the unit of measure selected in line A) from WLTS to the back of beach (BOB) and the vertical rise over this distance along the bearing of the sounding line. If the vertical rise cannot be established, then the gradient should be estimated using the following letter codes.

Gradient	Letter Code
1. Flat/flatter than 1:120	V
2. Mild/1:61 to 1:120	W
3. Gentle/1:31 to 1:60	X
4. Moderate/1:15 to 1:30	Y
5. Steep/steeper than 1:15	Z

The back of beach is that part of the shoreline which is normally well-defined and where extreme storm wave action ends and hinterland vegetation begins. Where there are cliffs or sea walls and other manmade barriers, they will normally be designated the back of beach (BOB).

(e) Indicate each sounding to the nearest 1/10 meter or 1/2 foot. The sounding must be reported in linear sequence commencing from WLTS and working toward the sea. For the second and subsequent sounding lines, the report will show similar data except that, under subparagraph A, the WLTS may be expressed using any of the following methods:

1. The bearing and distance from the WLTS of the previous sounding line.

2. The bearing and distance from the DP.

3. If any sounding line is based upon a new DP, then the same procedure as in line F-1A is to be used.

(7) GOLF. This paragraph is used to indicate underwater obstacles relative to sounding lines by naming the type of obstacle, its location, depth of water over the obstacle, and its estimated size.

(8) HOTEL. Gives the general description related to the beach as a whole and is divided into two areas: mean low water (MLW) to mean high water (MHW) and the backshore. An assessment of underwater composition is required. The following letter codes should be used:

Beach Composition	Letter Code
(a) Mud	A
(b) Clay	B
(c) Sand/up to pinhead size	C
(d) Gravel/up to top of thumb size	D
(e) Pebbles/up to clenched fist size	E
(f) Boulders/larger than human head size	F
(g) Coral	G

If there is a marked variation in composition along the beach, this is to be reported using the code by reference to designated sounding line numbers; for example, HOTEL 1 A08 to B02E; that is, foreshore line A08 to B0E now composed of pebbles.

(9) JULIET. The general description of the beach as a whole. Only two areas are covered, the portion of the beach between WLTS and MHW followed by the backshore (MHW to BOB). The letter codes below should be used:

Trafficability Code	Letter Code
(a) Firm. The area can be used by 2-wheel drive vehicles and trailers unless heavy and continuous use is intended.	W
(b) Moderate. The area can be used by military 3 or 4 ton vehicles which should be able to start from rest using 4-wheel drive. It is recommended that beach matting/roadway be used.	X
(c) Soft. Four-wheel drive vehicles cannot start from rest but might be able to cross a soft patch if already on the move. It is recommended that beach matting/roadway be used.	Y
(d) Very soft. The area is impassable to wheeled vehicles. Tracked vehicles may experience difficulty. Beach matting/ roadway is required.	Z

If there are marked differences in trafficability along the beach, this should be reported in a similar manner to HOTEL above; for example, JULIET 1 A08 to B02Y; that is, foreshore trafficability can only be assessed as above WLTS. It must be clearly understood that a correct assessment of trafficability cannot be guaranteed, bearing in mind the conditions under which the reconnaissance party may be working. Allowance must be made for a high degree of error.

(10) KILO. This is the description of any new exits or existing exits which have changed. Only the beach exit point is described; that is, where the beach exit meets the BOB. Exits are described using the following letter codes:

Exits	Letter Code
(a) Infantry. If any exit is usable by infantry only, the width is given.	A
(b) Tracked. If the exit is usable by both infantry and tracked vehicles, then the width is given followed by the appropriate trafficability code in JULIET.	B
(c) Wheeled. If the exit is usable by infantry and any vehicles, then the width is given followed by the appropriate trafficability code.	C
(d) Unusable. This denotes that the exit is unusable.	D

A new exit which would take both wheeled and tracked vehicles 10 meters wide and assessed as SOFT would be signaled as follows: K1. 27642765 C10Y.

(11) LIMA. The position of the recon team after completing its reconnaissance. Position is given as a six-figure grid reference or by some other previously arranged system of reference.

(12) MIKE. If the enemy has been seen or contacted, state YES in unit report and submit a detailed SPOTREP separately. If no enemy has been seen or contacted, state NIL.

(13) NOVEMBER. Any remarks or additional information relevant to this report can be sent under this paragraph.

c. Mission. The accomplishment of the CONBEREP, as with all reconnaissance missions, will depend on the availability of equipment and the unit's SOP. Figure 5-8 on the following page is an example of a completed CONBEREP.

MEANING		ENCODE
Subject line of message and serial number of code name.		CONBEREP 2
ALPHA	The following units of measure were used: meters, degrees magnetic, knots.	A148
BRAVO	A wrecked ship was located offshore and determined to be at indicated grid reference.	B. SHIPWRECK. TP 12345678
CHARLIE	Littoral drift was measured to be different from earlier information. Now is 1.2 knots towards left.	C1 point 2 LEFT.
DELTA	Two datum points were used in order to reflect two separate sets of sounding lines. The first DP was located at the water's edge and was established by cross bearings (325 and 213) from two chartered landmarks. The second DP was indicated by grid reference TP 12455982.	D. DPA 325 YELLOW LIGHT 213 NORTH TIP GREEN ISLE. DPB TP 12455982
ECHO	The soundings were taken at an interval of 10 meters along the sounding lines.	E1Ø
FOXTROT	1. The first line of soundings based upon datum point A.	F1AØ1
	A. The position of WLTS was coincident with DPA.	A. DPA
	B. The bearing of the sounding line taken from the beach was 181 M so that the reciprocal ØØ1 M must be reported.	BØØ1
	C. The DTG when sounding commenced was recorded and is reported.	C13Ø235A
	D. The distance from WLTS to BOB was determined to be 165 meters. The vertical rise was measured as 2 meters.	D2 IN 165
	E. The soundings as measured sequentially from WLTS to seaward were Ø.3, Ø.5, Ø.7, 1.Ø, 1.5, 1.9, 2.5, 3.Ø, 3.8, 4.4, 5.1, 1.9, 2.5, 3.Ø, 3.8, 4.4, 5.1, 6.Ø, and 6.5 meters. The soundings at WLTS will always be zero so they need not be reported.	EØ.3/Ø.5/Ø.7/1.Ø/1.5/1.9/2.5/3.Ø/3.8/4.4/5.1/6.Ø/6.5
	2. The second line of soundings based upon datum point A.	F2AØ2
	A. The position of WLTS relative to DPA was 5Ø meters away on a bearing of Ø9Ø M. Bearing is always given first, range last.	AØ9ØDPA5Ø
	B. The bearing of the sounding line was the same as the first line.	BØØ1
	C. The DTG when sounding was recorded is reported.	C1 3Ø258A
	D. The distance from WLTS to BOB was determined to be 14Ø meters and the vertical rise was measured to be 1.8 meters.	D1.8 IN 14Ø
	E. The soundings as measured sequentially from WLTS to seaward were Ø.3, Ø.6, 1.1, 1.3, 1.7, 1.8, 2.4, 2.7, 3.Ø, 3.4, 3.8, 4.2, 4.6, 4.9, 5.4, 5.8, 6.2, and 6.8 meters.	EØ.3/Ø.6/1.1/1.3/1.7/1.8/2.4/2.7/3.Ø/3.4/3.8/4.2/4.6/4.9/5.4/5.8/6.2/6.8
	NOTE: The next two sounding lines in this example have been omitted to avoid needless repetition.	
	5. The fifth line of soundings but the second to be based upon datum point B.	F5BØ2
	A. The position of WLTS relative to DPB was 1Ø5 meters on a bearing of 145 M. Bearing is always given first, range last.	A145DPB1Ø5
	B. The bearing of this line from the beach was 19Ø M so the reciprocal Ø1Ø M is reported.	BØ1Ø

Fig 5-8. CONBEREP.

	C. The DTG when sounding commences.	C130334A
	D. The distance from WLTS to BOB was determined to be 75 meters and gradient was estimated as moderate. Vertical rise could not be established.	D75Y
	E. The soundings as measured sequentially from WLTS to seaward were 0.3, 0.8, 1.2, 1.9, 2.7, 3.5, 4.0, 4.4, 5.1, 5.7, and 6.4 meters.	E0.3/0.8/1.2/1.9/2.7/3.5/4.0/ 4.4/5.1/5.7/6.4
GOLF	Along sounding line A03 a small fishing craft was found completely submerged. It was 100 meters from WLTS, 5 meters left of sounding line (measurement taken from center of craft), 1 meter of water over it, and its size was 7 meters by 2 meters.	G. SUNKEN CRAFT 5 LEFT, A03. 10 WLTS 1 OVER SIZE 2 BY 7
HOTEL	Previous information showed the foreshore and backshore to be uniformly sand. Now the foreshore is composed of pebbles between sounding lines A03 and B03.	H1A03 TO B03E 2NC
JULIET	Because of pebbles found between A03 and B03, the trafficability is judged to be soft. The remainder of the beach was found to be as before.	J1A03 TO B03Y 2NC
KILO	All exits were found to be the same except two, one of which has been closed by debris and the other which now has a paved road going into the hinterland from BOB.	D1 TP 12345678D 2 UP.87655321 C8
LIMA	The ART withdrew to a small uninhabited island close offshore.	L. TP 114535
MIKE	No enemy has been sighted.	M..NIL
NOVEMBER	Three bathing huts on left side of beach at the back.	N3 BATHING HUTS AT. TP 1185567

Fig 5-8. CONBEREP--cont.

Now that you have covered the confirmatory beach reconnaissance report, let's review. Next to the trafficability limitation, place the appropriate code.

Firm_____

Moderate_____

Very soft_____

Soft_____

The correct code letters are W, X, Z, Y.

Lesson Summary. During this lesson we have covered primarily amphibious type recon missions: specifically, preassault information, purpose of the RAO, beach survey, hydrographic surveys, and the confirmatory beach reconnaissance reports. The next lesson will cover riverine reconnaissance missions.

Lesson 3. RIVERINE RECONNAISSANCE MISSIONS

LEARNING OBJECTIVES

1. Identify the factors that determine the method of waterway reconnaissance.

2. Given a river/estuary report format and information pertaining to the phonetic lines, select the appropriate encode of the information given.

5301. Waterway Reconnaissance

The use of inland waterways for military purposes is usually considered only in underdeveloped areas in which alternate routes are either lacking or insufficient. In jungle areas and delta regions, inland waterways may offer the best and only practicable means of extensive ground movement for long distances.

a. Water route use. The actual capacity of a waterway and the availability of waterborne craft are primary elements in the decision to employ inland water routes. Waterways are categorized by type: open and restricted. Lakes, rivers, canals, and other inland waterways whose fairway (a navigable part of a river, bay, or harbor) can be negotiated without restriction are defined as open, while those inland waterways whose fairways are interrupted by dams, locks or by a required portage are defined as restricted.

b. Methods of river reconnaissance. The methods employed in reconnoitering waterways are determined by time available to conduct the reconnaissance, the extent and characteristics of the waterway, the amount of detailed information required, and the mode of transportation used. A preliminary map or aerial photographic study is made. Reconnaissance of a waterway may be accomplished by either paralleling the shore on foot or in vehicles, but preferably by directly following the water course in some type of watercraft. A combination of the two methods may also be employed. Checking critical underwater features such as width, depth, and likely underwater obstacles is mandatory no matter which method is used. When waterborne craft are used, each craft should be provided with suitable armament and improvised armor plating or sandbag protection.

c. River patrolling. A river patrol may be used for reconnaissance, combat, or security. Its missions are similar to those assigned to dismounted patrols. River patrols operate at greater speeds and cover greater distances than dismounted patrols because of their mobility. The great advantage of a river patrol is its ability to carry more equipment, weapons, and ammunition.

d. Riverine movement. Careful planning prior to the use of inland waterways is necessary. Many streams and rivers are not navigable and can be used for only short distances. Adequate reconnaissance (daytime overflights, maps, aerial photos) must be made of the waterways before attempts are made to use them.

e. Capabilities of the river patrol. A river patrol can accomplish the following missions:

- Reconnoiter an area to get information about the enemy, terrain, and route of advance.

- Provide security to the front, flanks, and rear of ground elements.

- Clear blocked waterways, seize and hold critical terrain, and relieve or reinforce isolated units.

f. Forming for a river patrol. A minimum of four personnel per boat are selected to form a river patrol. One of these is the coxswain. He should be an experienced operator having knowledge of riverine operations. The remaining personnel including the boat commander form the minimum number of personnel necessary to handle the boat should poling, lining, or rowing operations become necessary. A patrol consists of two boats. This provides depth, flexibility, and safety in case one boat should come under enemy fire or be swept into obstructions. Tactical integrity should be preserved whenever possible by selecting complete squads for a patrol and by assigning members of the same squad to a boat. Information on handling and operating rubber crafts is covered in study unit 7.

5302. The River/Estuary Report (DELTREP)

a. The river/estuary report. As in all other forms of amphibious reconnaissance mission, a standard format has to be used to record the results of the reconnaissance. The river/estuary report (DELTREP) is the form used to report the trafficability of riverine area. The proper format for this report follows:

(1) ALPHA. Units of measure.

(2) BRAVO. The area covered by the report is normally given by grid reference.

(3) CHARLIE. Main channel shown in the following sequence:

(a) Location. The grid reference of the entrance to the main channel.

(b) Seaward approach. The bearing from the sea as you approach the main channel.

(c) Reference points. The entrance to the main channel may be fixed by means of transits (reference points) and bearings of prominent features as seen from the sea. These features must be recognizable on a map or chart and are reported as follows:

1. Prominent features. Description and position of the feature followed by its bearing from the sea. If more than one, they are numbered 1, 2, 3, etc.

2. Transits. Description and position of first point followed by description and position of second point. If more than one set, they are numbered 1, 2, 3, etc.

(4) DELTA. Local system of buoys (if any) or markings placed by the amphibious recon teams (ARTS) are shown as follows:

Buoy	Number Code
(a) Starboard hand buoys--shape and color (if any)	1
(b) Port hand buoys--shape and color (if any)	2
(c) ART placed markers--description and location	3

(5) ECHO. Hazards are tabulated in the following numerical code and the location and description is given:

Hazard	Number Code
(a) Sand bars	1
(b) Wrecks	2
(c) Rocks	3
(d) Tidal races	4
(e) Other obstacles	5

(6) <u>FOXTROT</u>. The navigable limits are expressed as the highest point upstream in the main channel with the following depths at low water:

Depths	Number Code
(a) 2 meters	1
(b) 1 meter	2
(c) 1/2 meter	3

(7) <u>GOLF</u>. The beaching/landing points and their exits are described in the following order:

(a) The grid reference.

(b) The type or craft which can use the landing point indicated by the following number code:

Craft	Number Code
1. Landing craft medium/utility	1
2. Landing craft personnel	2
3. Shallow boats with outboard motors	3

(c) The overall trafficability of the beaching point and exit shown by the following letter code:

Beaching point	Letter Code
1. <u>Firm</u>. Can be used by 2- or 4-wheel drive vehicles and trailers unless heavy and continuous use is intended.	W
2. <u>Moderate</u>. Can be used by 3- or 4-ton vehicles which should be able to start from the rest position using 4- wheel drive. It is recommended that beach matting roadway be used.	X

Beaching point	Letter Code
3. Soft. Four-wheel drive vehicles cannot start from the rest position but might be able to cross a soft patch if already on the move. It is recommended that beach matting be used.	Y
4. Very soft. This is impassable to wheeled vehicles. Tracked vehicles may experience difficulty. Beach matting roadway is required.	Z

Note: If the beaching or landing point or its exit is unsuitable for any vehicles, no trafficability code letter is passed.

(d) Width of exit is given in the unit of measure from line A.

(8) HOTEL. The speed of the current tidal stream should be indicated in the units of measure shown in line A as follows: velocity, direction in which flowing (use a letter or letters indicating one of the eight points of the compass; for example, SE or W), date-time group, and location (grid reference). Several of these may be given if necessary to show variation.

(9) JULIET. The texture of the river bed is given in the following order:

(a) Grid reference.

(b) Composition of river bed is given in the following letter code:

Composition	Letter Code
Mud	A
Sand	B
Rock	C
Shingle	D
Other	E

(10) KILO. Any additional remarks are given in this paragraph.

An example of a DELTREP is shown below (fig 5-9) and continued on the following page.

MEANING		ENCODE
Subject line of message and serial number.		DELTREP 3
ALPHA	Units of measure: meters, degrees magnetic.	A148
BRAVO	Location of area reconnoitered was between grid reference 2251ØØ-234184-2541ØØ.	B2251ØØ.234184. 2541ØØ.
CHARLIE	1. Entrance to main channel is at grid reference 1ØØ235.	C1.1ØØ235
	2. Bearing of the approach to the main channel was Ø42 M.	2.Ø42
	3. A prominent feature which gives a cross bearing with a transit; using the church with spire at grid reference 2181Ø1 bearing 277 M, and a transit using the factory chimney at grid reference 24812Ø and pylon on hill at grid reference 255137.	3A.CHURCH 2181Ø1/277 B.CHIMNEY 24812Ø C.PYLON ON HILL 255137
DELTA	Starboard-hand red conical buoys. Port-hand black spherical buoys. ART placed stakes at grid reference 235134-238148 on both sides of the channel.	D1.RED CONICAL 2.BLACK SPHERICAL 3.STAKES PORT AND STARBOARD 235134. 238148
ECHO	Sandbars at grid reference 2351Ø4 and 2431Ø2-25Ø1Ø7. Tidal race at grid reference 24Ø1Ø5. Mines observed in areas of grid references 235Ø98-23ØØ99.	E1.2351Ø4.2431Ø2. TO 25Ø1Ø7 4.24Ø1Ø5 5.MINES 235Ø98. 23ØØ99
FOXTROT	Highest point upstream in the main channel to which it is possible to navigate with depths at low water as follows:	F1.238157. 2.238172
	1. 2 meters: grid reference 238157.	
	2. 1 meter: grid reference 238172.	
	3. Half-meter not found.	
GOLF	Two landing points were found as follows:	
	1. At grid reference 24Ø131. Suitable for landing craft personnel and shallow draft boats with outboard motors. Can be	G24Ø131.2/3 W 8. 238163.3

Fig 5-9. DELTREP

	used by 2-wheel drive vehicles. Beach exit is usable by any vehicle. Its width is 8 meters.	
	2. At grid reference 238163. Suitable for shallow draft boats with outboard motors. Landing of personnel only.	
HOTEL	At grid reference 237132 current was as follows:	H3N Ø7143ØZ.237132 4S Ø7195ØZ.237132
	1. At Ø7143ØZ 3 knots north.	
	2. At Ø7195ØZ 4 knots south.	
JULIET	The texture of the riverbed was as follows:	J236118B.237147A.
	1. At grid reference 236118 sand.	
	2. At grid reference 237147 mud.	
KILO	8 meters high sheer bank runs from grid reference 2511Ø9-249116.	K.SHEER BANK 8 HIGH 2511Ø9 TO 249116.

Fig 5-9. DELTREP--cont'd.

Now that you have covered the DELTREP, let's review. Using the format on the following page, determine the code for the following statement.

Your team has performed a recon on a portion of a river and has tabulated the following information. There are sandbars at grid (108967) and rocks at grid (108568), the beaching/landing points are at grid 102226, and the type of craft being used would be shallow boats with outboard motors. The site is unsuitable for any vehicles. Refer to the DELTREP format on the following page to answer the following question.

To send that information over the radio, the coded message would be ______________________________.

ECHO	Hazards. These are tabulated in the following numerical code:

	Number Code
Sand bars	1
Wrecks	2
Rocks	3
Tidal races	4
Other obstacles	5

The above are normally given as a six- or eight-digit grid reference and followed by a brief description.

FOXTROT — Navigable limits. The highest point upstream in the main channel with the following depths at low water:

	Number Code
2 meters	1
1 meter	2
1/2 meter	3

GOLF — Beaching landing points and their exits. These are described in the following order:

First. Grid reference.

Second. Type or craft which can use the land point indicated by the following number code:

	Number Code
Landing craft medium/utility	1
Landing craft personnel	2
Shallow boats with outboard motors	3

Third. Overall trafficability of the beaching point and exit shown by the following letter code:

	Letter Code
Firm: This can be used by 2-wheel drive vehicles or 4-wheel drive vehicles and trailers unless heavy and continuous use is intended.	W
Moderate: This can be used by military 3- or 4-ton vehicles which should be able to start from rest using 4-wheel drive. It is recommended that beach matting/roadway be used.	X
Soft: Four-wheel drive vehicles cannot start from rest but might be able to cross a soft patch if already on the move. It is recommended that beach matting/roadway be used.	Y
Very soft: This is impassable to wheeled vehicles. Tracked vehicles may experience difficulty. Beach matting/roadway is required.	Z

DELTREP Format

The correct response would be line Echo-1-108967 3-108568, line Golf-102226/3.

<u>Lesson Summary</u>. During this lesson you have covered the riverine reconnaissance missions and the river/estuary report. Keep in mind that the mission itself involves much more than simply filling out reports. As stated previously, the report will give you a general understanding of what the team needs to obtain.

Unit Exercise: Complete items 1 through 15 by performing the action required. Check your responses against those listed at the end of this study unit.

1. List the four types of intelligence information collected by reconnaissance teams for the preassault portion of an amphibious operation.

   a. ________________________________

   b. ________________________________

   c. ________________________________

   d. ________________________________

2. Identify the purpose of a reconnaissance area of operation.

   a. Established to identify reconnaissance primary routes.
   b. Established for designating targets of opportunity for the company.
   c. Established to identify primary routes for amphibious vehicles.
   d. Established to identify reconnaissance operational areas.

3. List the three elements of a beach survey report.

   a. ________________________________

   b. ________________________________

   c. ________________________________

4. Identify the three sections to a hydrographic survey.

   a. Observed enemy situation, time of observation, and equipment
   b. Heading, hydrographic description, and mission of the team
   c. Heading, hydrographic description, and observed enemy situation
   d. Observed enemy situation, hydrographic description, and number of men in the team

<u>Matching</u>: For items 5 through 9, match the phonetic code of the surf report in column 1 to the information that belongs under the code in column 2. Place your responses in the spaces provided.

Column 1	Column 2
<u>Phonetic Code</u>	<u>Surf Report Information</u>
____5. Alpha	a. Average time between breakers was 9 1/2 sec.
____6. Bravo	b. Average height was 1 1/2 meters.
____7. Charlie	c. The largest breaker was 2 meters high.
____8. Delta	d. The surf observation was completed at 071930Z.
____9. Echo	e. Units of measure used are meters, knots, and degrees.

<u>Matching</u>: For items 10 through 13, match the trafficability of beaches from the CONBEREP in column 1 to its letter code in column 2. Place your responses in the spaces provided.

Column 1	Column 2
<u>Trafficability</u>	<u>Letter Code</u>
____10. Firm	a. Z
____11. Moderate	b. Y
____12. Soft	c. X
____13. Very soft	d. W

14. Using the DELTREP format below and the information provided, select the correct codes.

You are on a recon mission to report the trafficability of a river. You determined the grid for the beaching/landing point is 105643. The type of landing craft capable of using the landing point is shallow boats with outboard motors. The overall trafficability of the landing point can be used by 3- or 4-ton vehicles, although you recommend that beach matting roadway be used.

a. G 105643 1Z
b. G 105643 3X
c. G 105643 2W
d. F 105643 1X

GOLF   Beaching landing points and their exits. These are described in the following order:

First. Grid reference.

Second. Type of craft which can use the land point indicated by the following number code:

Craft	Number Code
Landing craft medium/utility	1
Landing craft personnel	2
Shallow boats with outboard motors	3

Third. Overall trafficability of the beaching point and exits shown by the following letter code:

Trafficability	Letter Code
Firm: This can be used by 2-wheel drive vehicles or 4-wheel drive vehicles and trailers unless heavy and continuous use is intended.	W
Moderate: This can be used by military 3-or-4 ton vehicles which should be able to start from rest using 4-wheel drive. It is recommended that beach matting roadway be used.	X
Soft: Four wheel drive vehicles cannot start from rest but might be able to cross a soft patch if already on the move. It is recommended that beach matting/roadway be used.	Y
Very soft: This is impassable to wheeled vehicles may experience difficulty. Beach matting/roadway is required.	Z

DELTREP Report Format.

15. Identify the factors that determine the method of waterway reconnaissance.

    a. The amount of time available, extent and characteristic of the waterway, the number of troops, and air support available
    b. The number of troops and air support available, the number of rubber crafts needed, extent and characteristic of the waterway
    c. The time of day, the number of rubber crafts needed, extent and characteristic of the waterway, the number of troops needed
    d. The amount of time available to conduct the reconnaissance, the extent and characteristics of the waterway, the amount of detail required, and the mode of transportation used

UNIT SUMMARY

This study unit provided you with information concerning reconnaissance amphibious type operations. The first lesson covered information collected for preassault amphibious operations, RAOs, beach survey and surf reports. In the second lesson you learned about the CONBEREP. In the third lesson, you learned about riverine reconnaissance missions. The next study unit will provide you with information concerning lines of communications type reconnaissance missions.

Study Unit 5 Exercise Solutions

		Reference
1.	a. Hydrographic information	5101a
	b. Beach description	
	c. Inland terrain description	
	d. Enemy defense	
2.	d.	5102a
3.	a. Heading	5103c
	b. Beach description	
	c. Observed enemy situation	
4.	c.	5201b
5.	e.	5202b
6.	d.	5202b
7.	b.	5202b
8.	c.	5202b
9.	a.	5202b
10.	d.	5203b
11.	c.	5203b
12.	b.	5203b
13.	a.	5203b
14.	b.	5302a
15.	d.	5301b

STUDY UNIT 6

LINES OF COMMUNICATIONS RECONNAISSANCE MISSIONS

Introduction. When conducting combat on foreign shores, the maps you have of the area may be very unreliable. You may find roads that are not on the map or see roads on the map that no longer exist. The same problem may apply to rivers and streams. The intermittent stream on the map may turn out to be a deep river 100 feet across. Prior to an infantry unit moving from one point to another, the route should be reconnoitered. Reconnaissance Marines can perform this type of advance mission to investigate an area to ensure that Marine units arriving later know what type of obstacles, manmade and natural, they will encounter. During this study unit, you will learn about route, bridge, and ford reconnaissance.

Lesson 1. ROUTE RECONNAISSANCE

LEARNING OBJECTIVE

Given the Route Report format and information pertaining to the phonetic lines, appropriately encode and record the information given.

6101. Route Consideration

Reconnaissance teams are frequently assigned the task of conducting a route reconnaissance to assist in determining the best route advancing units should take. Note, however, that reconnaissance Marines can conduct only hasty route reconnaissance. A deliberate and thorough route reconnaissance can be conducted by trained engineers.

a. General. In the event that some particular terrain is considered critical to the use of the route, such as a bridge, culvert, or road surface, the reconnaissance patrol should be augmented with qualified specialists, for example, engineers. Considerable care must be given to the selection of the individuals who will accompany the patrol since it is essential that they be capable of moving at the same pace as the patrol and they must be sufficiently trained to function properly as members of the reconnaissance team.

b. Information obtained from a route reconnaissance. The immediate military trafficability of a route can be determined by evaluating certain information about the road which a reconnaissance team obtains from direct measurement and observation. Some of this information is shown in figure 6-1 and discussed later.

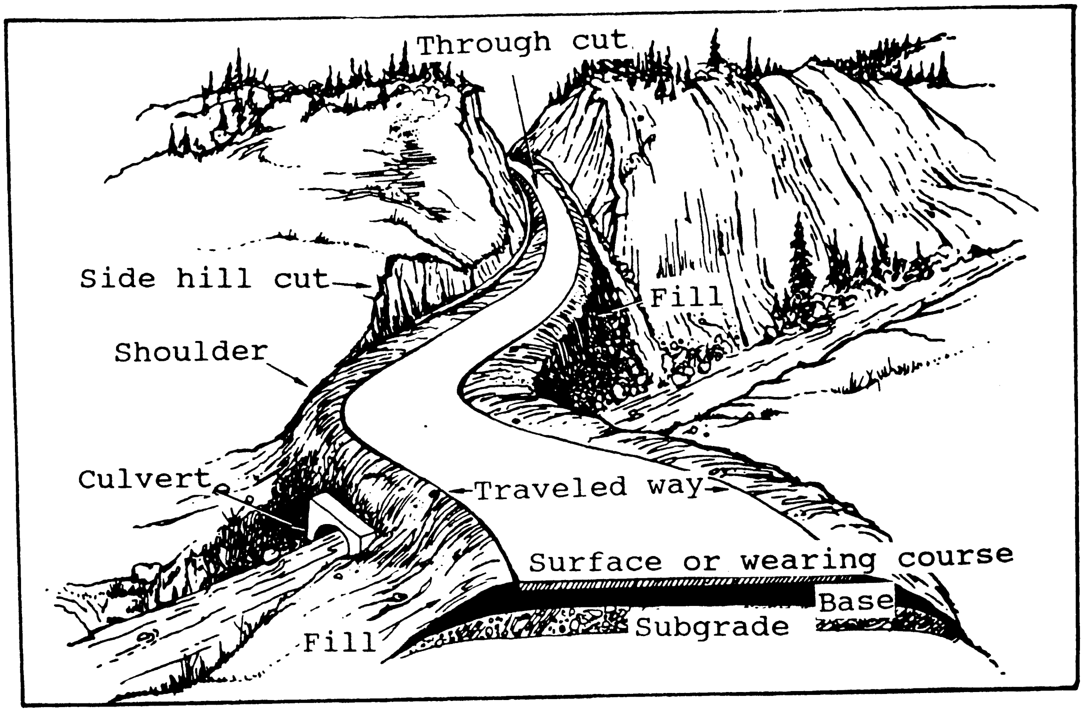


Fig 6-1. Road nomenclature.

(1) Identification. A road can be identified in two ways: by the road grid reference and by the road marking. The road grid reference refers to the 6-digit map coordinates of the points on the road where the recon will begin and end. The road marking refers to the civilian or military name and or number of the road.

(2) Distances between points. Easily recognizable points along the road are selected from a map or aerial photo study of the road. The ground distance between these points is determined by using the graphic bar scale on the map before the road recon is conducted. These points and distances are used as navigational aids; the exact distances are checked during the actual reconnaissance.

(3) Steep grades. The rise or fall of a ground form is referred to as a slope.

(4) Sharp curves. The speed at which vehicles can move along a specified route is also affected by sharp curves. Only those curves whose radius of curvature are less than 30 meters (100 feet) are reported by the recon team.

(5) Route constrictions. A route recon mission discovers any obstructions to traffic flow which place size limitations upon vehicles utilizing a specific route. At times, underpasses are obstructions. Particular care is required when measuring overhead clearance. If overhead clearance is less than 4.25 meters (14 feet) it is considered an obstruction to traffic flow. Recon Marines report the following items of information about route constrictions:

(a) Map location

(b) Type of constriction

(c) Overhead clearance

(d) Bypass information

(6) Drive off areas. Note and record the areas along the reconnoitered route which permit vehicles to enter and park on the route.

(7) Slide areas. Note and record the locations of areas along the reconnoitered route for which rockslides may present traffic hazards or obstacles.

(8) Road surface materials. Routes are designated by their ability to withstand the effects of weather. The weather classifications of routes are listed below:

(a) Type X. An all-weather route which has a waterproof surface and is only slightly affected by precipitation or temperature changes.

(b) Type Y. An all-weather route which normally does not have a waterproof surface and is considerably affected by precipitation and temperature changes.

(c) Type Z. A fair-weather route which quickly becomes impassable in adverse weather.

c. Route and road report (ROUTEREP). The information collected by a recon team conducting route reconnaissance must be combined and converted into a readable and easily understood form before it is submitted to higher headquarters. The ROUTEREP format should be supplemented by accurate overlays using standard route reconnaissance symbols, sketches, and distant, medium, and closeup ground photographs.

You, as a member of a recon team, should be able to accurately complete the data needed in a ROUTEREP if you have a working knowledge of the essential elements of route reconnaissance. The information required for completing the subject lines of the ROUTEREP is provided below.

(1) ALPHA. Indicate here the units of measure.

(2) BRAVO. Indicate here the location of start and finish points of that part of the route actually reconnoitered.

(3) CHARLIE. Indicate here the type of route as indicated by the following letter code.

Route	Letter Code
(a) All-weather route Passable to all traffic in any weather except deep snow or flood.	X
(b) Limited all-weather route Volume of traffic may be limited by bad weather; e.g., muddy or snowy roads.	Y
(c) Fair-weather route Passage only in fair weather. Quickly becomes impassable in bad weather. Cannot be kept open by maintenance short of major construction.	Z

(4) DELTA. Here only qualified personnel may indicate military classification of this route/road.

(5) ECHO. Indicate here the average width of the traveled way followed by the width of grading. The traveled way is the hard surface of the road; the width of grading is the width of the traveled way plus the width of the shoulders.

(6) FOXTROT. Indicate here route constrictions, listed individually and described in the following order.

(a) Nature of constriction

(b) Location of constriction

(c) Dimension of constriction using length/height

(d) The type and characteristics of the constriction are represented by a letter; see the letter codes listed below:

Type	Letter Code
1. Height of constriction	A
2. Width of constriction	B
3. Radius of curve constriction	C
4. Gradient	D

(e) The bypass potential at the constriction is represented by a letter; use the following letter code chart:

Bypass Potential	Letter Code
1. Bypass easy. Detour possible without engineer effort.	P
2. Bypass difficult. Detour possible after engineer improvement.	Q
3. Bypass impossible.	R

(7) GOLF. Indicate here the availability of concealment from the air categorized according to the following numerical code:

Concealment	Number Code
(a) Good concealment available at regular intervals along route.	1
(b) Some concealment.	2
(c) Little or no concealment.	3

(8) HOTEL. Indicate here any other factors that must be considered by a landing force intending to use the route. The meteorological obstacles are snow, flooding, and ice. Other considerations could include such problems as refugees and local traffic. Snow, flood, and ice hazards are listed using the numerical code below:

SNOW HAZARD		
MOVEMENT FACTOR	NUMBER CODE	LETTER CODE
Snow. No hinderance to vehicles.	1	P*
Snow. Movement difficult for wheeled vehicles. Some digging or other route preparation may be necessary.	1	Q*
Snow. Movement impossible for wheeled vehicles.	1	R*

FLOOD HAZARD		
MOVEMENT FACTOR	NUMBER CODE	LETTER CODE
Flood. No hinderance to wheeled vehicles.	2	P*
Flood. Movement difficult for wheeled vehicles. Some route preparation may be necessary in places. Water proofing or fording gear is advisable.	2	Q*
Flood. Movement is impossible for wheeled vehicles.	2	R*
Ice. If ice conditions are present and restrict movement.	3	Q*

Note: * The letter is followed by the depth of snow or water. Unit of measure given on line A. Example: Snow one inch high would be coded 1P1.

Any other conditions will be number coded as 4. An example of a completed route report is shown below.

MEANING		ENCODE
Subject line of message followed by serial number.		ROUTEREP 4
ALPHA	Measurements in feet only used.	A.3
BRAVO	Route reconnoitered between grid references 122456 and 126473.	B122456.126473
CHARLIE	Traffic volume is likely to be reduced by heavy rain.	C.Y
DELTA	No engineer advice available.	
ECHO	Average width of travelled way is 30 ft.	E30
FOXTROT	Constrictions as follows:	
	1. Low bridge at grid reference 123546 height 12 ft. Bypass impossible.	F. Bridge 123546/A12R
	2. Crater in road at grid reference 125463 leaving road width of 13 ft. Bypass easy.	Crater 125463/ B 13P
	3. Rockfall leaving 18 ft. of travelled way grid 125469. Bypass possible after engineer improvement.	ROCKFALL 125469 /B18Q
GOLF	Little or no concealment possible along the route.	G3
HOTEL	Approximately 2 ft. of soft snow is lying along the route. Examples below.	H1Q2
	<u>Smooth ice</u> is prevalent on the route	H3.4
	Refugees on this route restricting traffic flow.	REFUGEES
	<u>Flooding</u> is serious but the ART unsure if it falls into Q or R.	H2QR 1 to 2

Fig 6-2. Example of a Route Report.

Let's review. Using the report format and the situation below, write the proper encode for a radio transmission on the blank line provided.

After reconnoitering a specified route, you record the following data for encoding. The route is constricted by boulders at grid 890765 ranging from 1 to 10 meters in height and 1/2 meter in width. The bypass potential will be difficult but possible with engineer help. There are regular intervals of concealment along the route. How would you encode this information?

FOXTROT. Indicate here route constrictions, listed individually and described in the following order.

(a) Nature of constriction

(b) Location of constriction

(c) Type of constriction is represented by a letter;

Type	Letter Code
1. Height	A
2. Width	B
3. Radius of curve	C
4. Gradient	D

(d) The bypass potential at the constriction is represented by a letter; the following letter code chart:

Bypass Potential	Letter Code
1. Bypass easy. Detour possible without engineer effort.	P
2. Bypass difficult. Detour possible after engineer improvement.	Q
3. Bypass impossible.	R

GOLF. Indicate the availability of concealment from air -categorized according using the following numerical code:

Concealment	Number Code
(a) Good concealment available at regular intervals along route.	1
(b) Some concealment.	2
(c) Little or no concealment.	3

____

The correct answer for the above report is Line F. Boulders 890765/A 1-10 meters, B 1/2 meters Q, Line G.1.

Lesson Summary. During this lesson you learned about route reconnaissance and the report which is used. In the next lesson you learn about bridge reconnaissance and the mission report.

Lesson 2. BRIDGE RECONNAISSANCE

LEARNING OBJECTIVES

1. Given illustrations of various bridge spans, match each illustration to its appropriate name.

2. Given a Bridge Report format and information pertaining to the phonetic lines, appropriately encode the information given.

6201. Bridge Reconnaissance

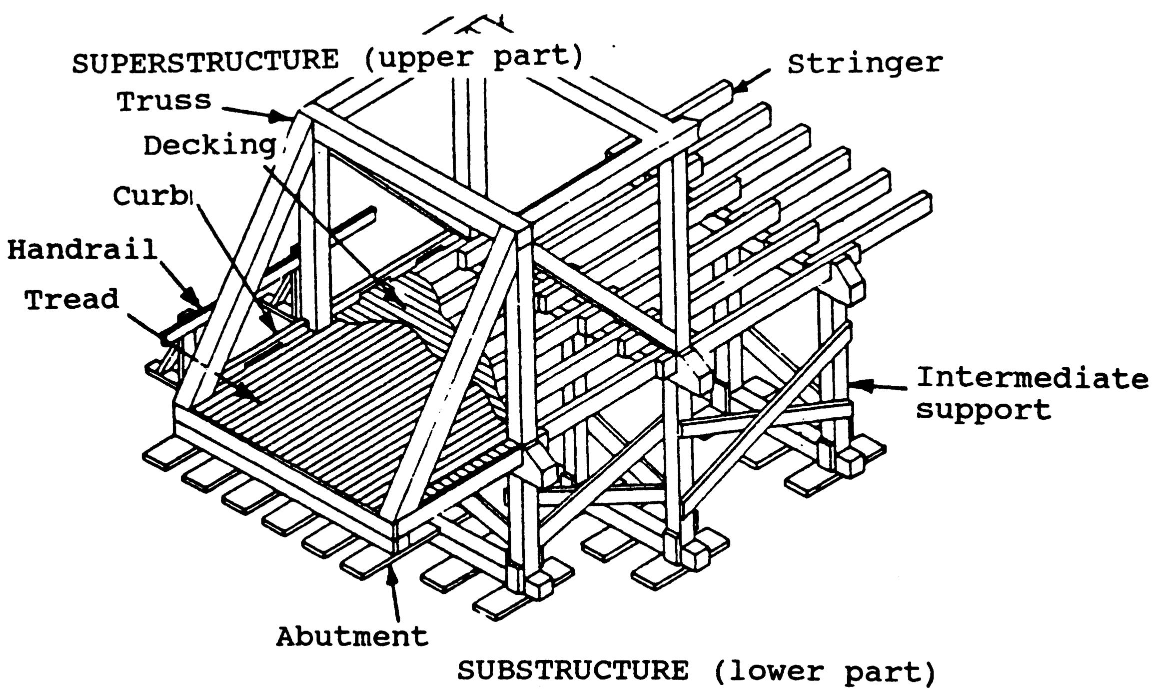
The bridge recon mission is usually conducted in conjunction with a route or road reconnaissance, but it may be assigned as a separate mission. A mission of this type will usually require the expertise of engineer specialists, although a highly trained recon Marine should be capable of conducting a hasty bridge recon mission. As in the case of a route or road reconnaissance, a bridge recon mission conducted by recon Marines is not to be considered a deliberate and thorough reconnaissance since that can be conducted by trained engineers only. Assignment of specialists to accompany a reconnaissance patrol requires the same care in selection as was previously discussed for the route and road reconnaissance mission.

a. Bridge reconnaissance mission. As stated above, a bridge reconnaissance may be conducted in conjunction with a route or road reconnaissance. Specifically, bridge recons are performed to determine the trafficability of a particular bridge. After all the pertinent information is collected about the bridge, it is determined what type of traffic can use it (such as tanks, artillery, and trucks). In addition, this information can be used to determine if the enemy will have a need to destroy the bridge or protect it for their own use.

b. Bridge nomenclature. A bridge is defined as a structure that carries a roadway or railway over a depression or obstacle. A bridge which is completely supported by its two abutments (end supports) is called a single span bridge. A bridge having one or more intermediate supports (piers) between the abutments is a multispan bridge. In general, a bridge has two principal parts: the substructure (lower part) and the superstructure (upper part). In addition, bridge approaches and bypasses are important features of a bridge complex and are included in bridge reconnaissance. Basic bridge nomenclature is illustrated in figure 6-3.

(1) <u>Substructure</u>. The substructure consists of the traverse supports for the superstructure. The supports are abutments and perhaps also intermediate supports. The substructure takes the load from the superstructure and transmits it to the ground.

(2) <u>Superstructure</u>. The superstructure consists of the stringer, flooring, curbing, walks, handrails, trusses, and other components forming the part of the bridge above the substructure.



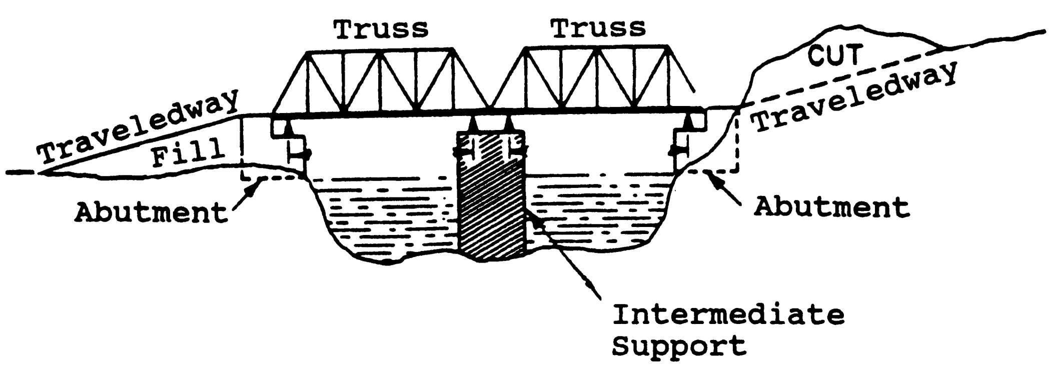
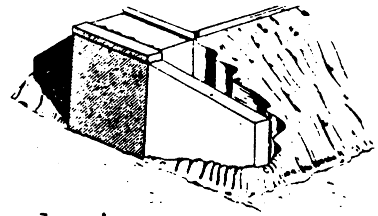
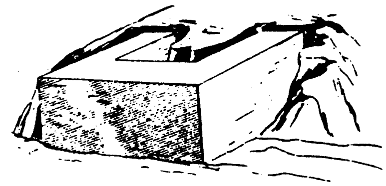


Fig 6-3. Basic bridge nomenclature.

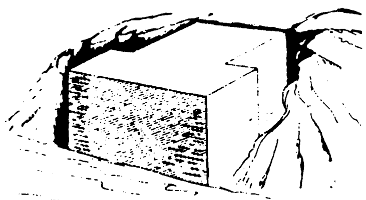
(3) Bridge abutments. The ground supports at the shore ends of the bridge are called abutments. They may be constructed of concrete, masonry, or earth with a wooden end wall and abutment sill. Typical abutments are shown in figure 6-4.



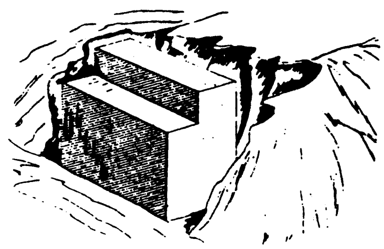
Typical wing-type abutment.



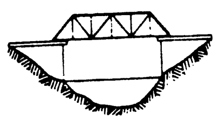
Typical U-type abutment.



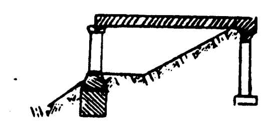
Typical T-type abutment.



Typical straight abutment.



Box abutment.



Pier Abutment.

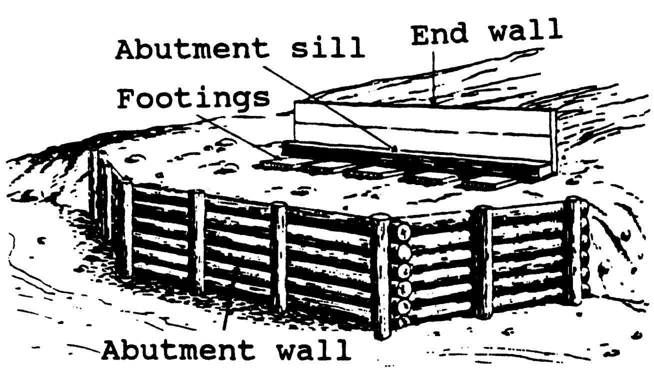


Fig 6-4. Bridge abutments.

(4) Intermediate supports. Intermediate supports are ground supports between abutments. They may be constructed of logs, timbers, masonry, steel or concrete. See figure 6-5 for typical intermediate bridge supports.

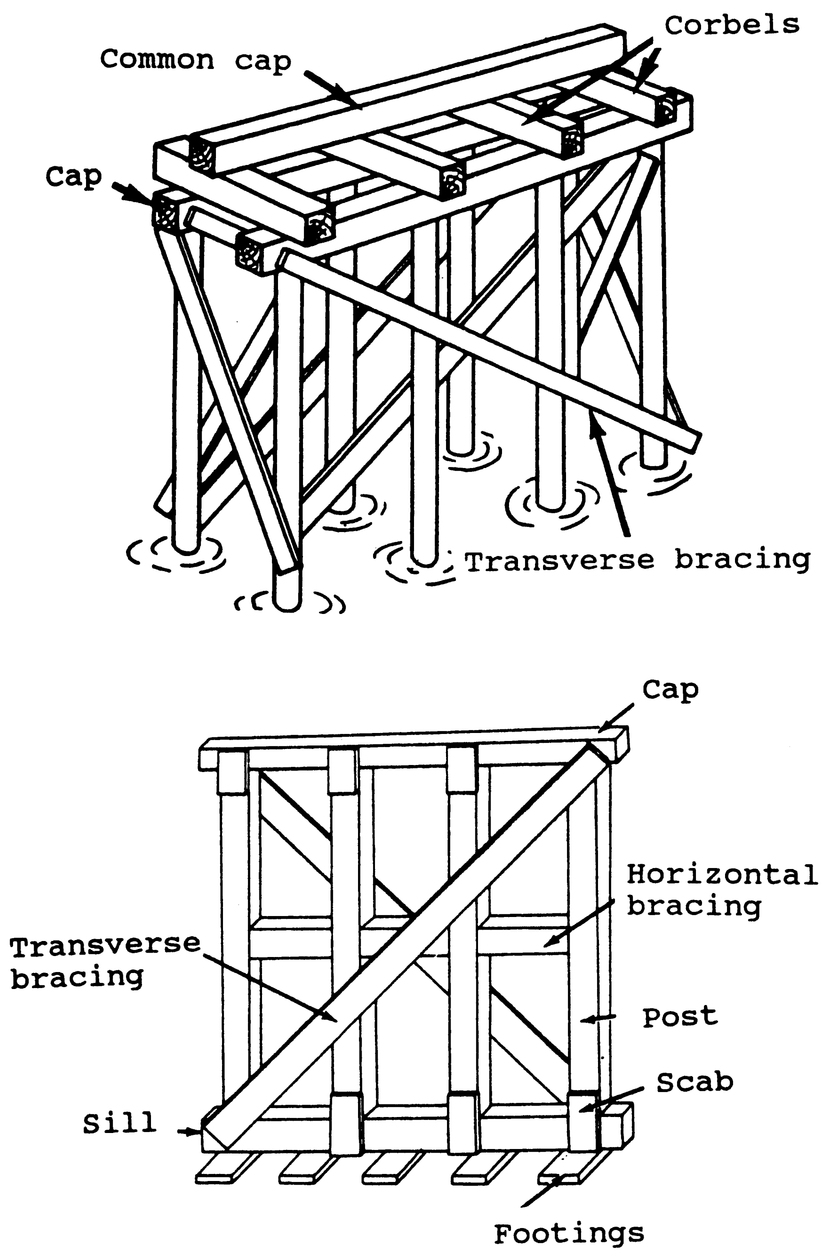


Fig 6-5. Intermediate bridge supports.

(5) Bridge spans. Bridges are best described by identifying the type of span and construction material. The most common span types are shown in figure 6-6.

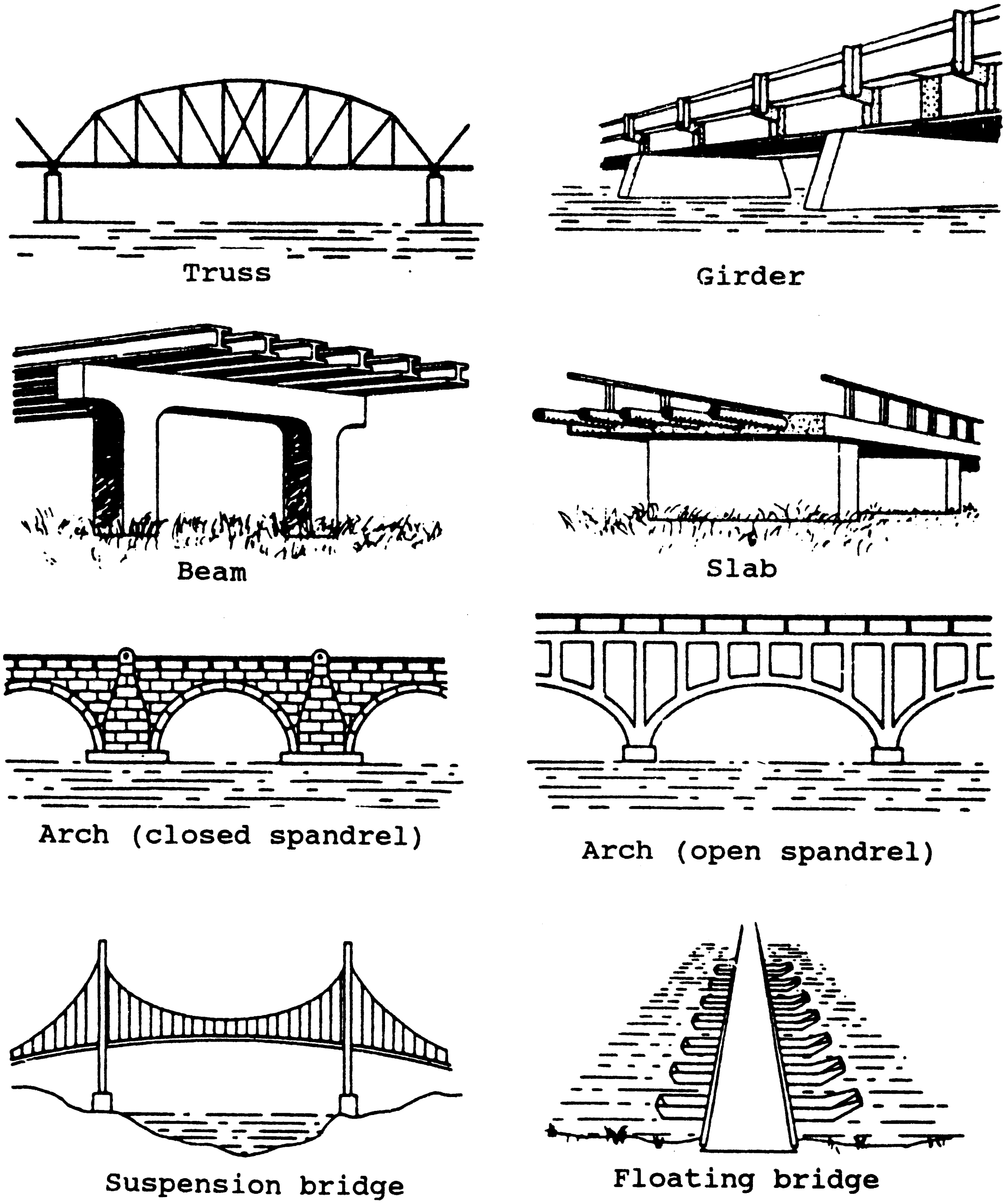
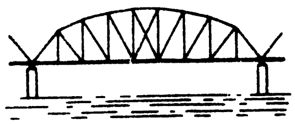
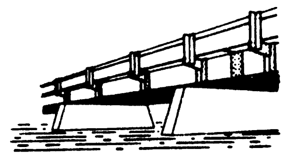


Fig 6-6. Bridge spans.

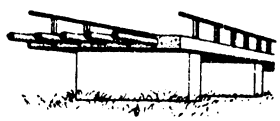
Now that we have discussed bridge spans, let's review. Label properly the four illustrations of bridge spans shown below.



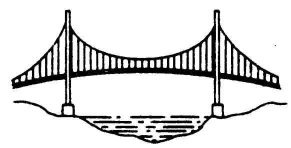
(1) ____________________



(3) ____________________



(2) ____________________



(4) ____________________

The correct answers are (1) truss, (2) slab, (3) girder, and (4) suspension bridge.

6202. Bridge Report

After a reconnaissance team has gathered all pertinent information concerning a particular bridge, the information must be relayed to higher headquarters. To help disseminate the information and relay it faster over the radio, use the bridge report (BRIDGEREP).

a. Bridge report subject lines. Below find the information needed to complete the subject lines of the BRIDGEREP.

(1) ALPHA. Indicate here the unit of measurement used.

(2) BRAVO. Indicate here the grid reference of the bridge, followed by engineer classification, if known.

(3) CHARLIE. Indicate here the minimum clear distance between the inside edges of the bridge structure from a height of 30 centimeters (1 foot) above the roadway surface and upwards.

(4) DELTA. Indicate here the under-the-bridge clearance, which is the maximum clear distance between the underside of the bridge and the surface of the ground or water. If water is tidal, include the DTG of measurements.

(5) ECHO. Indicate here the number of bridge spans, span construction material, and the type of span construction by the letter and number codes listed below. In addition, list spans in sequence starting from the west.

If a bridge is aligned with north and south, list the spans from the north, inserting the letter "N" preceding the numbers and letters.

(a) Use the following letter codes to indicate the span construction material.

Material	Letter Code
1. Steel or other metal	A
2. Concrete	K
3. Reinforced concrete	AK
4. Prestressed concrete	KK
5. Stone or brick	P
6. Wood	H
7. Other types of material	O

(b) Use the following numerical code to indicate the type of span construction will be shown for each span in the following numerical code:

Construction Type	Number Code
1. Truss	1
2. Girders	2
3. Beams	3
4. Slab	4
5. Arch (closed spandrel)	5
6. Arch (open spandrel)	6
7. Suspension	7

Construction Type	Number Code
8. Floating	8
9. Swing	9
10. Bascule	10
11. Vertical lift	11
12. Any other type not mentioned	12

(6) FOXTROT. Here list and number the length of individual spans in the same order they were reported on line E (ECHO) above. Classify any damaged spans using the following letter code:

Damage	Letter Code
(a) May be significantly damaged, but probably capable of supporting light vehicles.	A
(b) Impassable to traffic, but span not totally destroyed.	B
(c) Span destroyed.	C

(7) GOLF. Indicate here the overall bridge length using the unit of measure designated in line A (ALPHA) above.

(8) HOTEL. Indicate here the roadway width using the unit of measure designated on line A (ALPHA) above.

(9) JULIET. Indicate here the overhead clearance using the unit of measure designated in line A (ALPHA). Provide clearance measurements for the following points in the following order:

(a) Left shoulder

(b) Center of roadway

(c) Right shoulder

(10) KILO. Indicate here the bridge bypass potential using the following letter codes.

Bypass Potential	Letter Code
(a) Bypass easy. The obstacle can be crossed within immediate vicinity of the bridge without improvement to the bypass.	P
(b) Obstacle can be crossed within immediate vicinity of the bridge, but some work necessary to prepare the bypass.	Q
(c) Bypass impossible. Crossing the obstacle is possible only by detour some distance from the original site.	R

Give the location of the bypass in grid reference and provide a brief description of the bypass.

(11) LIMA. State here any additional remarks here.

The BRIDGEREP format should be accompanied by supporting photographs, if possible. Both ground and aerial photographs are desirable. The minimum ground photographic coverage required includes a side view, a view from the traveled way of the bridge, and a view from underneath the bridge. A completed BRIDGEREP form is shown in figure 6-7 on the following page.

MEANING		ENCODE
Subject line of message, serial number, and map series 703E, sheet 50501V.		BRIDGEREP 2 MAP 703E/5050 ROMAN 4
ALPHA	Meters only used.	A1
BRAVO	Bridge location at grid reference 123456. No engineer adviser available to assess military classification.	B123456
CHARLIE	The minimum clear distance between the inside edges of the bridge structure at a height of 1 ft. or 30 centimeters above the roadway surface is 9 meters.	C9
DELTA	The maximum clear distance between the underside of the bridge and the surface of the water which is tidal was 4 meters at 171230Z.	D4. 171230Z
ECHO	Example 1. The bridge runs west-north west to east-south east and has five open spandrel concrete arches.	E5 K6
	Example 2. The bridge runs north-north west to south-south east and has three stone arches, the middle one of which is a draw bridge.	E N 1P6 1A11. 1P6
FOXTROT	Example 1. All five spans are 20 meters long and are undamaged.	F1-5 20
	Example 2. Span lengths are 20 meters except for center which is 15 meters. First span has had bomb damage but can still support light vehicles.	F 1/20A 2/20 3/15 4-5/20
GOLF	The overall length of the bridge is 110 meters.	G110
HOTEL	Roadway width is 8 meters.	H8
JULIET	The bridge has a horizontal girder 10 meters above the roadway.	J10
	or	or
	The bridge has a curved top 6 meters high at each edge, 10 meters high in the middle of the roadway.	J6. 10. 6
KILO	Bypass easy at grid reference 124456 by a ford which is one-half meter at its deepest, track is 3 meters wide at point of entry and the ford is 50 meters long.	K. P 124456 FORD 0 POINT 5 DEEP 3 WIDE 50 LONG
LIMA	No further remarks.	

Fig 6-7. Example of completed BRIDGEREP.

b. Equipment. Sometimes special items of equipment, such as those listed below, are required to aid in the execution of a deliberate bridge reconnaissance.

(1) Use a clinometer to measure gradients of the bridge and approaches.

(2) Use a Polaroid type camera to photograph the bridge during daylight.

(3) Use infrared equipment for night reconnaissance.

(4) Use swimming or scuba equipment when the bridge spans a deepwater obstacle.

(5) Use ropes if the reconnaissance team must get underneath the bridge flooring to measure stringers and other objects.

Lesson Summary. During this study unit you have learned about bridge reconnaissance and completion of the bridge report used for the bridge recon mission. In the next study unit, you will learn about the ford reconnaissance.

Lesson 3. FORD RECONNAISSANCE

LEARNING OBJECTIVE

Given a Ford Report format and information pertaining to the phonetic lines, select the appropriate encode of the information given.

6301. Fording Trafficability

A ford is a location in a water barrier where the physical characteristics of the current, bottom, and approaches permit the passage of personnel, vehicles, and other equipment whose suspension system remains in contact with the stream bottom.

a. Trafficability. Fords are classified according to their crossing potential for foot troops and wheeled or tracked vehicles. Fordable depths for vehicles can be increased by suitable waterproofing. The trafficability of fords is shown in figure 6-8.

TYPE OF TRAFFIC	Shallow fordable depth (meters)	Minimum width (meters)	Maximum a desirable percent of slope for approaches
Foot	1 (40")	1 (40") Single file 2 (80") Column of 3's	100%
Trucks and truck drawn artillery	.6 (24")	3.6 (12')	33%
Light tanks	1 (40")	4.2 (14")	50%
Medium tanks b	1.2 (48")	4.2 (14')	50%

a Based on hard, dry surface.

b Depths up to 4.3 meters can be negotiated with deepwater fording kit.

Fig 6-8. Trafficability of fords.

b. <u>Approach/Exit of the ford site</u>. These may be paved with concrete surface material, but they are usually unimproved. The composition of the slope of an approach to and from a ford site must be carefully observed to determine its exit trafficability in inclement weather or after fording vehicles have saturated the surface material.

c. <u>Bottom</u>. The composition of the stream bottom of a ford site determines its trafficability. It is important to determine whether the bottom is composed of sand, gravel, silt, clay, or rock. In some cases, the natural river bottom of a ford may have been improved to increase its load-bearing capacity and to reduce water depth. Improved fords may have gravel or concrete surfacing, sandbags, metal screening, matting, and timber or wood planking. Bottom conditions are determined by checking the stability and composition of the bed. If the water is shallow, the check can be made by wading across the obstacle. Underwater reconnaissance may be required to determine bottom conditions in deeper water.

d. <u>Climatic conditions</u>. Seasonal floods, excessive dry seasons, freezing, or other extremes of weather may effect the fordability of a stream. For this reason, the climatic effect to which a ford may be subjected must be considered.

e. <u>Current</u>. The velocity of the current and the presence of debris are recorded in order to determine their effect, if any, on the condition and passability of a ford. Current is characterized as swift when moving more that 1.5 meters per second and slow when moving less than 1 meter per second.

f. <u>Low water bridges</u>. During high water periods, low water bridges become submerged and may be easily confused with paved fords. Low water bridges consist of two or more intermediate supports with a concrete decking and are located within ravines and gullies. During a reconnaissance, it is important to differentiate between a bridge and a paved ford because of differing military load classifications.

g. <u>The ford reconnaissance report</u>. Modern military vehicles and equipment provide the commander with increased capabilities to conduct vehicular fording operations. Mass destruction weapons employed by the enemy demand dispersion of our troops and reduction of traffic constrictions and obstructions. Our forces cannot afford to be bottlenecked because of a lack of suitable bridges in the area. Reconnaissance personnel are required to locate and accurately report suitable stream crossing sites now more than ever before. The information required to complete the subject lines of a ford reconnaissance report follows.

(1) ALPHA. Indicate here the units of measure.

(2) BRAVO. Enter here any data which establishes positive identification of the ford such as route, grid reference, geographic location, and the name of the stream or crossing.

(3) CHARLIE. Indicate the type of ford by using the appropriate code letter listed below.

Type	Letter Code
(a) Auto	A
(b) Pedestrian or animal	P
(c) Deep water	D
(d) Swimming vehicles	S

(4) DELTA. Record here the characteristics of the crossing. This would include the width and depth of the crossing and the velocity of the stream at the present water level, and also at low, mean (average), and high water level. The letter codes below are used in conjunction with the unit of measure designated in line A, to record and send the stream's velocity.

Characteristic	Letter Code
(a) Width	W
(b) Depth	D
(c) Velocity (present level)	VPL
(d) Velocity (low level)	VLL
(e) Velocity (mean level)	VML
(f) Velocity (high level)	VHL

(5) ECHO. Indicate here the composition of the stream bottom using the following code letters.

Composition	Letter Code
(a) Mud	M
(b) Clay	C
(c) Sand	S
(d) Ground	G
(e) Rock	R
(f) Artificial paving	P

(6) FOXTROT. Enter here any other pertinent data not recorded elsewhere on the report. This includes a description of hazards, approach roads, guide markers, alternate crossings, and any information which may assist in classification of the ford. If this information is too lengthy, you should wait until you return from the mission before you submit it rather than transmitting it by radio to higher headquarters.

h. Additional information. If the ford is passable, draw sketches of the ford showing both a profile and a site plan. The profile sketch indicates the water level and the elevation of the stream bottom and approaches. The site plan gives the alignment of the ford and its approaches with the appropriate dimensions. Show terrain and other site features in the immediate area of both banks. Also indicate the north arrow and the direction of the stream's flow. In the event that the situation does not allow for detailed sketches, photographs will be sufficient. The shots should show the banks, approaches, and exits. A completed Ford Report is shown on the following page.

MEANING		ENCODE
Subject line of message followed by serial number		FORDREP
ALPHA	Measurement in feet and meters.	A.1,3
BRAVO	The location of the ford is Beaver Creek, 109876.	B.109876
CHARLIE	This ford crossing can accommodate either pedestrian or animal.	C.P
DELTA	The width of the crossing is 20 ft, depth is 5 ft, and the velocity at present is 2 to 3 meters per second.	D.W20,D5,VPL 2 to 3 meters per second
ECHO	The composition of the stream bottom is sand.	E.S
FOXTROT	Any additional information pertinent to the ford.	

Fig 6-9. Ford Report with encodes.

Using the report format and the situation on the following page, write the (encode) for the radio transmission on the blank line provided.

After performing a ford reconnaissance, your team has tabulated the following information. The location of the ford is 456765, the type of ford is passable for Marines and animals, the width is 10 feet, the depth is 5 feet, the velocity of the water current is 1 to 2 meters per second at the present level, and the composition of the stream bottom is mud and sand.

BRAVO. Enter here any data which establishes positive identification of the ford such as route, grid reference geographic location, and the name of the stream or crossing.

CHARLIE. Indicate the type of ford by using the appropriate code letter listed below.

Type	Letter Code
(a) Auto	A
(b) Pedestrian or animal	P
(c) Deep water	D
(d) Swimming vehicles	S

DELTA. Record here the characteristics of the crossing. This would include the width and depth of the crossing and the velocity of the stream at the present water level, and also at low, mean (average), and high water level. A standard unit of measurement is used to record the stream's velocity, while the following letter code is used to record and send remaining information.

Characteristic	Letter Code
(a) Width	W
(b) Depth	D
(c) Velocity (present level)	VPL
(d) Velocity (low level)	VLL
(e) Velocity (mean level)	VML
(f) Velocity (high level)	VHL

ECHO. Indicate here the composition of the stream bottom using the following code letters.

Composition	Letter Code
(a) Mud	M
(b) Clay	C
(c) Sand	S
(d) Ground	G
(e) Rock	R
(f) Artificial paving	P

The correct code to send over the radio would be Line B.456765/C-P/D-W 10ft, D 5ft, VPL 1 to 2 meters per second/ E. M/S

__Lesson Summary__. In lesson 3 you covered ford reconnaissance missions and the report that accompanies completion of that mission. In lesson 4 you will cover observation posts.

Lesson 4. OBSERVATION POST

__LEARNING OBJECTIVES__

1. Identify the maximum amount of time observation posts are occupied.

2. Given a situation, use the information provided to complete a ground observer report.

6401. Surveillance

Surveillance is the observation of an area with the purpose of obtaining and reporting information about everything that occurs within that area. Information obtained is used to provide security, prevent surprise, implement the timely use of supporting arms, and plan and execute friendly operations. An observation post is a fixed location on the ground from which surveillance is maintained over a particular area or sector. Infantry units establish and maintain OPs within or just forward of their lines to detect movement of enemy forces. Reconnaissance teams establish and maintain distant OPs well forward of friendly areas and within enemy controlled territory.

a. __Capabilities__. Observation posts are capable of providing visual coverage of a large area with minimum personnel. When employed properly, the OP will provide detailed reports of events occurring within their sector of observation. The OP can rapidly report what they have observed with appropriate communications equipment and are responsive to requests for additional information. Observation posts can request and control supporting arms on enemy targets in their field of observation without compromising their position.

b. __Limitations__. The principal limitation of OPs is the reliance on human vision which is subject to interference by darkness, fog, rain, snowfall, smoke, vegetation, and terrain. Another limitation is the passive nature of the observation post; its personnel cannot actively seek information, but have to "sit back and wait until something happens." In areas where long range observation is good to excellent, OPs produce excellent results; in areas covered with dense vegetation and poor fields of observation, OPs produce poor results. In the latter case, using OPs to gather information may have to be abandoned entirely while all information is gathered by active reconnaissance patrolling.

c. <u>Selection of OP positions</u>. The position selected for an OP must satisfy two basic requirements:

(1) Provide optimum visual coverage of the area of interest.

(2) Provide good radio communications with higher headquarters.

These requirements must be considered and satisfied simultaneously in selecting an OP position. An observation post is normally positioned on high ground to provide good observation and communication. However, the OP should not be positioned on the top of hills or ridgelines, but rather at a point on the slope between the crest or ridgeline and the bottom of the hill. This position should provide optimum observation, communication, cover, and concealment. Placing the OP on the side of a slope helps to ensure that it is removed from the natural lines of drift which the enemy might use. The actual location of the OP is determined by the OP team when it arrives at the tentative location. Sometimes a number of positions must be occupied and checked before a suitable position is found.

d. <u>Sector of observation</u>. Observers are equipped with binoculars which increase their range of observation and the details they can see. The sector of observation should not exceed 120 degrees in angular width (fig 6-10). Using binoculars under the best conditions of visibility, the observer's maximum range of good observation is about 5,000 meters but his optimum range of observation rarely exceeds 2,500 meters. The optimum range is that area in which you can easily detect details of enemy uniforms, weapons, and equipment. When observation of a road, trail, river, or other linear feature is of primary concern, the OP should be located so that it is possible to observe down the long axis of the linear feature.

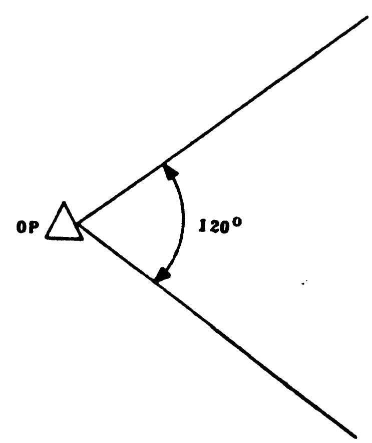


Fig 6-10. Sector of observation for one OP.

e. <u>Communications</u>. Primary reliance is placed on the radio for reporting observations. Reporting observations as they occur is the best method since it is consistent with the reconnaissance principle of rapid reporting. However, limited use of the radio may be necessary to prevent enemy interception or detection. Messages must be brief and concise following the format and procedures specified by higher headquarters. Transmission security is important and coded shackle sheets are used when appropriate. The SALUTE report is used extensively when reporting sightings of the enemy or his activity. The SITREP (situation report) is used to report the normal progress of the team's actions.

f. <u>Operation of the OP</u>. Team members may remove their equipment but must keep it within arms' reach and be ready to put it on in case they depart the position quickly. Always keep the individual weapon ready. The OP position should not be occupied for more than 24 hours, but it is usually relocated more often than that. An OP team normally occupies the OP position during the daylight hours, moves to a night harbor site for the night, and reestablishes the OP at another position the following day. Escape routes and actions upon contact with the enemy are planned and made known to all members of the OP team. Times for the team to be relieved are established and adhered to. Care is taken to conceal radio antennas. Upon departure of the OP team, all signs of human occupation are removed. Continuous observation of the objective area is maintained, weather and visibility permitting, throughout the time the OP is occupied.

g. <u>OP log</u>. The OP log is a record of the events that occurred during the operation of the OP. It is maintained by the radio operator and checked periodically by the OP team leader. The OP log consists of copies of all radio messages transmitted and received by the OP and the ground observer's report (fig 6-11). Radio messages are best recorded in a standard Marine Corps message book. Maintaining the OP log correctly is an important part of OP operation. It is used by the patrol during debriefing and submission of a complete patrol report.

GROUND OBSERVER'S REPORT

OP. NO. 1B3 LOCATION 195623 SHEET NO. 1 of 1

UNIT CHARLIE 1 FROM 010300Z DEC 73 TO 020300Z DEC 73

IN CHARGE OF OP Sgt Recon Joe

MAP REF. SHEET 1602 1V Series B900

ITEM NO	TIME DATE	LOCATION			ACTIVITY	REPORTED TO WHOM? WHEN?	OBSERVER'S NAME
		AZIMUTH	RANGE	REF. PTS.			
1.	0400 01 DEC	230	100	RIV	3 ENEMY MOVING WEST ALONG SOUTH BANK OF RIVER. KHAKI UNIFORMS RIFLES AND PACKS	MIKE FORCE 0430	FIDELIS

Fig 6-11. Ground observer's report.

Now that you have covered the observation post, let's review. What is the maximum amount of time an OP site may be occupied?

The correct answer is no longer than 24 hours.

Lesson Summary. Surveillance and gathering intelligence concerning the enemy is of vital importance. The ability of the reconnaissance team to stealthfully gather information is mastered through motivation and realistic training. The information gathered could very well save Marine's lives.

Unit Exercise: Complete items 1 through 12 by performing the action required. Check your responses against those listed at the end of this study unit.

1. Using the route report format below and the information provided, select the correct codes. You are on a route recon mission and are planning to encode the following information. The units of measure are in feet, the route that was reconnoitered extends from grid 108654 to 109653. The route is a limited all-weather road with a traveled way averaging 35 feet. There is an abatis made of heavy wood logs and concrete. This constriction is located at grid 108651. The abatis is 6 feet high and 5 feet in width. Bypass possible after engineer improvement.

   a. A.3,B. 108654-109653,C.Y, E.35, F. Abatis 108651/A6, B 5ft, Q.
   b. A.3, B 108654-109653,C.Z E. 30, F. Abatis 108651/A 5 B 6Q,
   c. A.3,B108654-109653, C.Y,E.35, F Abatis 108651/A6, B 5 R 63
   d. A.1, B. 108654-109653, C.X, E. 35, F. Abatis, 108654/ A21, B5Q

ALPHA	Units of measure.
BRAVO	Location. Location of start and finish of that part of the route actually reconnoitered.
CHARLIE	Type. The type of route is indicated by the following letter code: Letter Code All weather route — X Limited all weather route — Y Fair weather route — Z
DELTA	Military Classification. This assessment will only be made by qualified personnel. As a guide: Class 50: Average traffic routes Class 80: Heavy traffic routes Class 120: Very heavy traffic routes

Route Report format.

ECHO	Width. The average width of travelled way followed by the average width of grading is reported. The "travelled way" is the hard surface of the road; the "width of grading" is the width of the travelled way plus the width of the hard shoulders.
FOXTROT	Route Consideration. These are listed individually and described in the following order:

First: Nature of constriction

Second: Location of constriction

Third: Type of constriction shown as a letter in the following code:

	Letter Code
Height of constriction	A
Width of constriction	B
Radious of curve constriction	C
Gradient	D

Fourth: Dimensions of constriction using length/height unit of measure given in ALPHA.

Fifth: Bypass potential at constriction using the following letter code:

	Letter Code
Bypass easy. Local detour possible without engineer effort.	P
Bypass difficult. Bypass possible after engineer improvement.	Q
Bypass impossible.	R

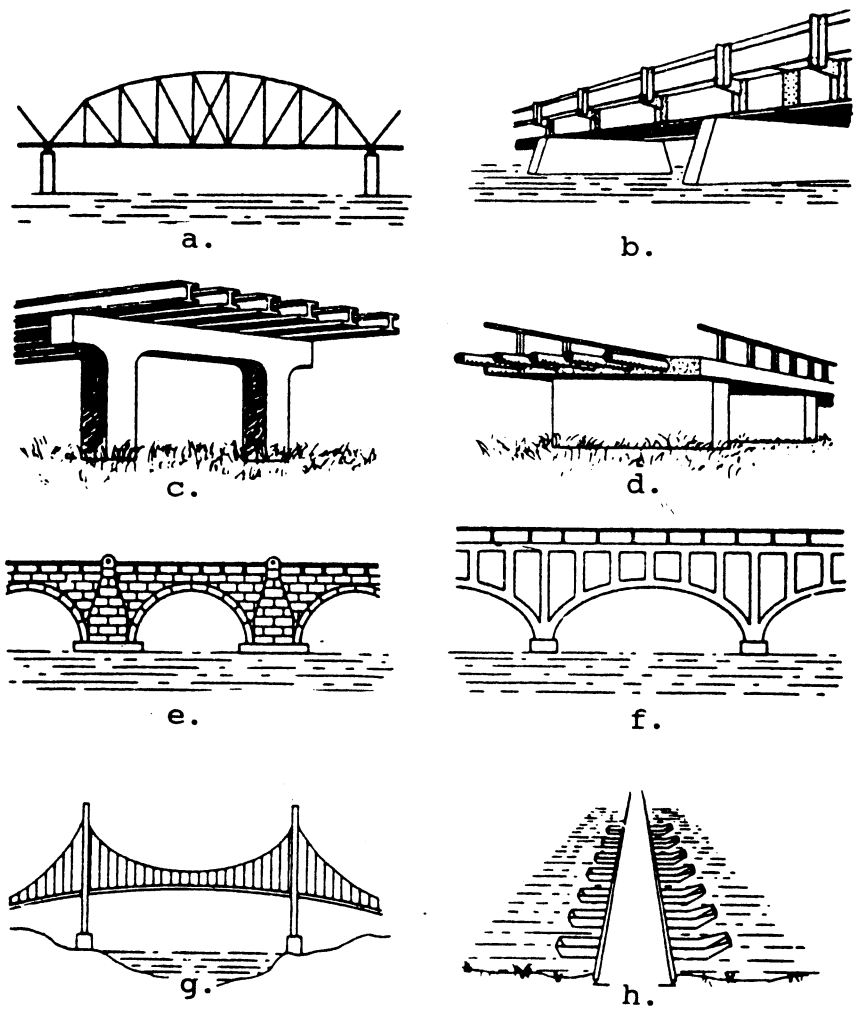
Route Report format, cont'd.

Matching: For items 2 through 8, match the bridge span name in column 1 to its appropriate illustration below. Place your responses in the spaces provided.

Column 1

Bridge Span Name

____2. Arch (open spandrel)
____3. Arch (closed spandrel)
____4. Beam
____5. Truss
____6. Girder
____7. Suspension bridge
____8. Slab



Bridge span illustrations.

9. Using the Bridge Report format below and the information provided, select the correct codes. You are on a bridge recon mission and are planning to encode the following information. The bridge which you are collecting information on has seven arch type (closed spandrels) made of reinforced concrete. The spans are equally divided at 10 meters apart, and have been totally destroyed.

a. E.7KK5/F.1-710C
c. E.7 AK5/F.1-710C
b. E.5 AK7/F.1-5 7C
d. E.7 AK3/F. 701C

Spans

First: The number, material, and type of span construction will be shown for each span by number and letter symbols.

Second: Spans will be listed in sequence starting from the west. If a bridge is running close to north/south, the spans will be listed from the north and the letter N inserted preceeding the numbers and letters.

Third: Material of span construction will be shown in the following letter code:

	Letter Code
Steel or other metal	A
Concrete	K
Reinforced concrete	AK
Prestressed concrete	KK
Stone or brick	P
Wood	H
Other types	O

Fourth: Type of span construction will be shown for each span in the following numerical code:

	Number Code
Truss	1
Girders	2
Beams	3
Slab	4
Arch (closed spandrel)	5
Arch (open spandrel)	6
Suspension	7
Floating	8
Swing	9
Bascule	10
Vertical lift	11
Others	12

Bridge Report format.

FOXTROT	<u>Length and condition of spans</u>. List and number lengths of individual spans in order reported in ECHO above. If any spans are damaged, classify them in the following letter code.	
		<u>Letter Code</u>
	May be significantly damaged, but probably capable of supporting light vehicles.	A
	Impassable to traffic, but span not totally destroyed.	B
	Span destroyed.	C

Bridge Report format, cont'd.

10. Using the ford reconnaissance report below and the information provided, select the correct codes. You are planning to encode the following information. The ford on which your team is gathering information is for troops and autos. The width of the river is 25 feet and the depth is 1 foot. The VHL is 1.5 meters a second. The composition of the stream bottom is sandy with mud deposits.

a. C. AP, D. 25ft/D 1ft/VHL 1.5 meters per sec, E. S/C
b. C. AS, D. 25ft/D 1ft/VHL 1.5 meters per sec, E. S/M
c. C. AP, D. W 25ft/D 1ft/VHL 1.5 meters per sec, E. S/M
d. C AP, D. W 1ft/D 25ft/VHL 1.5 meters per sec, E. S/M

CHARLIE. Indicate the type of ford by using the appropriate code letter listed below.

Type	Letter Code
(a) Auto	A
(b) Pedestrian or animal	P
(c) Deep water	D
(d) Swimming vehicles	S

DELTA. Record here the characteristics of the crossing. This would include the width and depth of the crossing and the velocity of the stream at the present water level, and also at low, mean (average), and high water level. A standard unit of measurement is used to record the stream's velocity, while the following letter code is used to record and send remaining information.

Characteristic	Letter Code
(a) Width	W
(b) Depth	D
(c) Velocity (present level)	VPL
(d) Velocity (low level)	VLL
(e) Velocity (mean level)	VML
(f) Velocity (high level)	VHL

ECHO. Indicate here the composition of the stream bottom using the following code letters.

Composition	Letter Code
(a) Mud	M
(b) Clay	C
(c) Sand	S
(d) Ground	G
(e) Rock	R
(f) Artificial paving	P

Ford Report format.

11. Using the information provided, fill out the OP report below. Your location is 095623 and your unit is Hotel 1. The OP leader's name is LCpl Fidelis. Your OP number is 1B1 and you will remain in position from 301500Z APR 91 to 011500Z MAY 91. While observing near your reference point, which is the river, at a distance of 300 meters, 35 degrees, you notice 14 enemy troops moving south on the eastern side of the river. On closer examination, you see their equipment is NBC-related and they are wearing what appears to be MOPP suits. All the enemy troops are carrying automatic weapons and packs. You report the information to Hotel 2 at 1430.

GROUND OBSERVER'S REPORT

OP. NO. LOCATION SHEET NO. 1 of 1

UNIT FROM TO

IN CHARGE OF OP

MAP REF. SHEET 1602 1V Series B900

ITEM NO	TIME DATE	LOCATION			ACTIVITY	REPORTED TO WHOM? WHEN?	OBSERVER'S NAME
		AZIMUTH	RANGE	REF. PTS.			

Ground observer's report.

12. Identify the maximum number of hours observation posts are occupied.

a. 12
b. 18
c. 24
d. 48

UNIT SUMMARY

During this study unit you have learned about route, bridge, and ford reconnaissance. Also covered was the observation post. Although you did not learn how to perform the route, bridge, or ford reconnaissance mission, you did learn the information needed to be obtained while accomplishing the mission. In the next study unit you will learn about insertions and extractions.

Study Unit 6 Exercise Solutions

		Reference
1.	a.	6101c
2.	f.	6201b
3.	e.	6201b
4.	c.	6201b
5.	a.	6201b
6.	b.	6201b
7.	g.	6201b
8.	d.	6201b
9.	c.	6202a
10.	b.	6301g
11.	See ground observer's report below.	6401g
12.	c.	6401f

GROUND OBSERVERS REPORT

OP. NO. 1B1 LOCATION 195623 SHEET NO. 1 of 1

UNIT HOTEL 1 FROM 301500Z APR 91 TO 011500Z MAY 91

IN CHARGE OF OP LCpl Fidelis

MAP REF. SHEET 1602 1V Series B900

ITEM NO	TIME DATE	LOCATION			ACTIVITY	REPORTED TO WHOM? WHEN?	OBSERVER'S NAME
		AZIMUTH	RANGE	REF. PTS.			
1.	1600 30 APR	35	300	RIV	14 ENEMY TROOPS MOVING SOUTH ON THE EASTERN SIDE OF THE RIVER. WEARING WHAT APPEARS TO BE MOPP SUITS, PACKS AND AUTOMATIC WPNS.	HOTEL 2 1430	FIDELIS

STUDY UNIT 7

METHODS OF INSERTIONS AND EXTRACTIONS

Introduction. Some of the different type of training you will receive while being in a reconnaissance unit is centered around insertions and extractions. Most Marine Corps units are not trained to helicast, parachute (fig 7-1), or lockout of submarines. A reconnaissance team can be introduced into its area of operation by one of the above mentioned methods. A reconnaissance unit can also be introduced into its area of operation by helicopter or vehicle insertion. Regardless of what insertion method is selected, the insertion method should provide the reconnaissance unit with the best opportunity to get into the area without detection. The insertion should also facilitate the use of speed and surprise. The method selected should be that which will insert the patrol with the least probability of being detected by the enemy or as close to its operational area as tactically possible. During this study unit you will learn about insertions and extractions of reconnaissance teams.

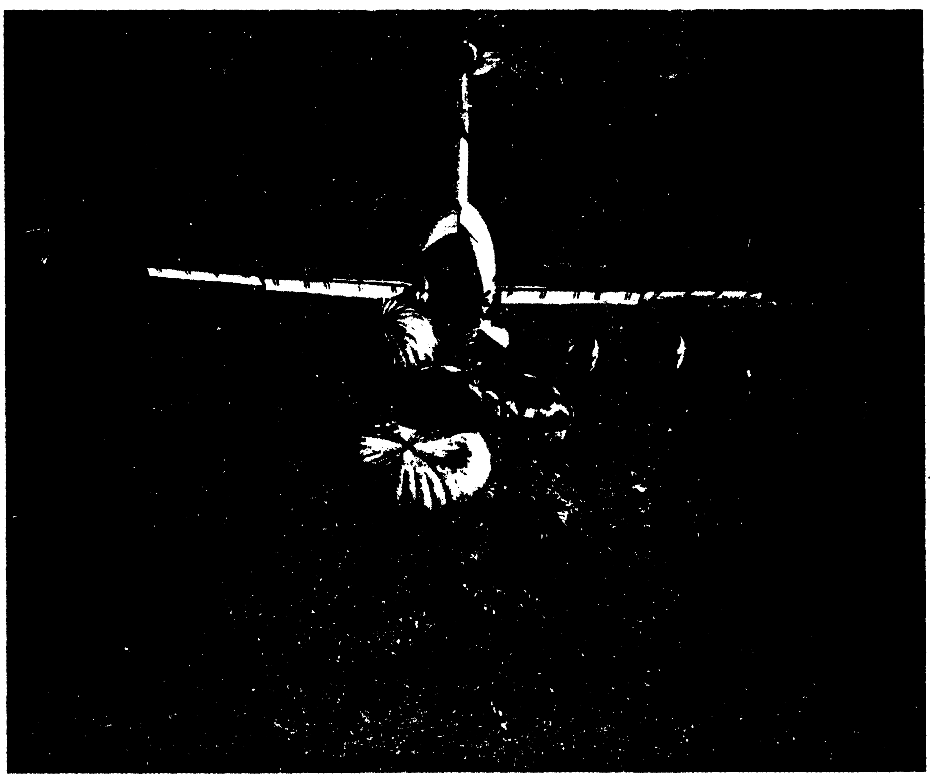


Fig 7-1. Insertion of recon teams.

Lesson 1. SELECTING THE LANDING/WITHDRAWAL AREA

LEARNING OBJECTIVES

1. Identify the four requirements for selecting a landing area.

2. Identify the predominant factors considered when selecting an inland landing area.

3. Identify the four requirements for selecting a withdrawal area.

4. Identify what inland withdrawal times are based on.

7101. Landing Area

Recon teams are inserted in many different ways. The method of insertion will depend on the mission, the number of men in the team, the enemy situation, and the supporting unit's availability.

a. Selecting the landing area. Every reconnaissance team commences its movement to the objective from an initial orientation point in the area of operations. The location of this initial orientation point is a precise location on the ground used to orient the patrol for movement. The vehicle transporting the recon team may not be able to locate a precise point from the sea or from the air prior to insertion. Once the team is inserted, they may not be able to follow a precise course due to the terrain or the enemy disposition. Consequently, a landing area is selected instead of a landing point along with one or more initial orientation points. An initial orientation point serves as a patrol checkpoint which is easily recognizable on the ground and, if possible, located on or near a prominent terrain feature (fig 7-2). The relationship between the initial orientation point and the landing area is such that when members of a patrol are landed anywhere near or within the insertion area, the members will know that they must first move in a specified direction to the initial orientation point. Accurate navigation to the objective is now possible once this is accomplished. A landing area should meet the following requirements.

(1) Allows the undetected approach and retirement of the transporting vehicle once the team is inserted

(2) Is recognizable from the transporting vehicle

(3) Is large enough to allow for minor errors in the predicted drift of parachutists, swimmers, or boat teams

(4) Is far enough from the selected initial orientation point so that reasonable errors in patrol navigation or strong unknown winds or currents will not change the initial direction of the patrols movement

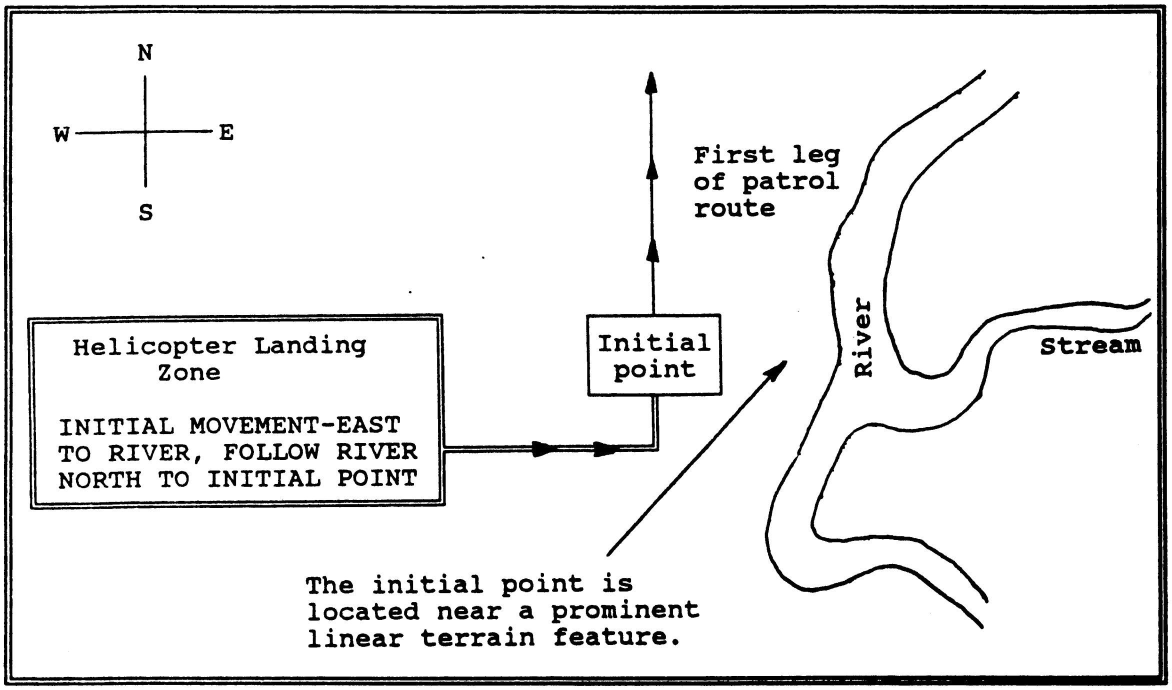


Fig 7-2. The initial orientation point.

b. <u>Coastal landing areas</u>. Selecting a coastal landing area usually involves a compromise between an area which permits easy landing with little security (wide surf zone, flat, sandy beach backed by an easily traversed hinterland) and one which provides maximum security at the cost of a difficult or hazardous landing (narrow, steep, rocky beach backed by cliffs). The predominant factor in selecting coastal landing areas is the surf and its effects on boats or swimmers. Remember, the preferred surf conditions exist when ocean waves break in a single breaker line about 200 feet from the beach and the intervening space has several foam lines which disperse the force of the surf. The least desirable may be when several breaker lines exist or when the breakers spill directly on the beach. These are characterized generally by the existence of sandbars and reefs, or a steep underwater gradient, narrow surf zone, plunging or surging breakers, and sharply rising terrain from the coastline.

c. <u>Inland landing areas</u>. The selection of an inland landing area is also based on a compromise between the ease of landing and the security factor. A team may be landed inland by parachuting or by debarking directly from an aircraft on the ground.

The predominant factors considered in selecting the inland landing area are the presence and nature of natural and manmade obstacles and the enemy disposition. If parachuting, flat, open, recently plowed fields offer the greatest ease of landing, but the least security for the patrol; conversely, densely wooded areas are of the greatest danger to the landing, and may require lowering from a hovering helicopter. Rolling terrain covered with sparse woods or brush is, consequently, often selected as a parachute landing area. Aircraft landing and takeoff characteristics determine the suitability of a landing area when obstacles are present.

d. Selecting a landing time. Landings made by swimming or boating from ship, submarine, or by parachuting from an aircraft should be executed during darkness. Preferably these landings should be executed under no more than a crescent moon and early enough to permit assembly, orientation, and the movement of the patrol to its objective area before dawn.

(1) Coastal landing times. Since the predominant factor considered in selecting a coastal landing area is the surf and since the surf varies with the state of the tide, you must consider tidal conditions in selecting an exact time for a coastal landing.

(2) Inland landing time. Selecting an exact time for inland landing is based on forecasted wind and visibility. Visibility must be sufficient for aircraft orientation. Strong surface winds may make the landing too difficult to be attempted, particularly in the case of parachute landings. Once an extended reconnaissance operation has begun in an area, be careful when selecting inland landing times for different patrols so as not to establish a pattern.

e. Actions in the landing area. To reduce the chances of being detected by the enemy, it is essential that the patrol remain in the landing area for a minimum length of time. The specific actions to follow when landing in the insertion area will be stated in the patrol's order and should adhere to the following guidelines:

(1) Consolidate the patrol and account for personnel.

(2) Conceal equipment which the patrol no longer needs such as inflatable boats and parachutes.

(3) Move out to the initial orientation point and wait for any missing personnel to rendezvous.

(4) Move out on your patrol route to the objective.

7102. Withdrawal Area

A reconnaissance team may be withdrawn or recovered by various methods which may include swimming or boating to a submarine or surface craft. Withdrawal can also involve embarking directly on board a helicopter or being extracted by SPIE (fig 7-3). The requirement for eventual recovery of a team will always exist, however, the necessity for physical withdrawal of a recon team from the objective area varies. A team may be assigned a surveillance or terminal guidance mission after its reconnaissance mission, or the recovery method planned may involve a linkup with friendly forces.

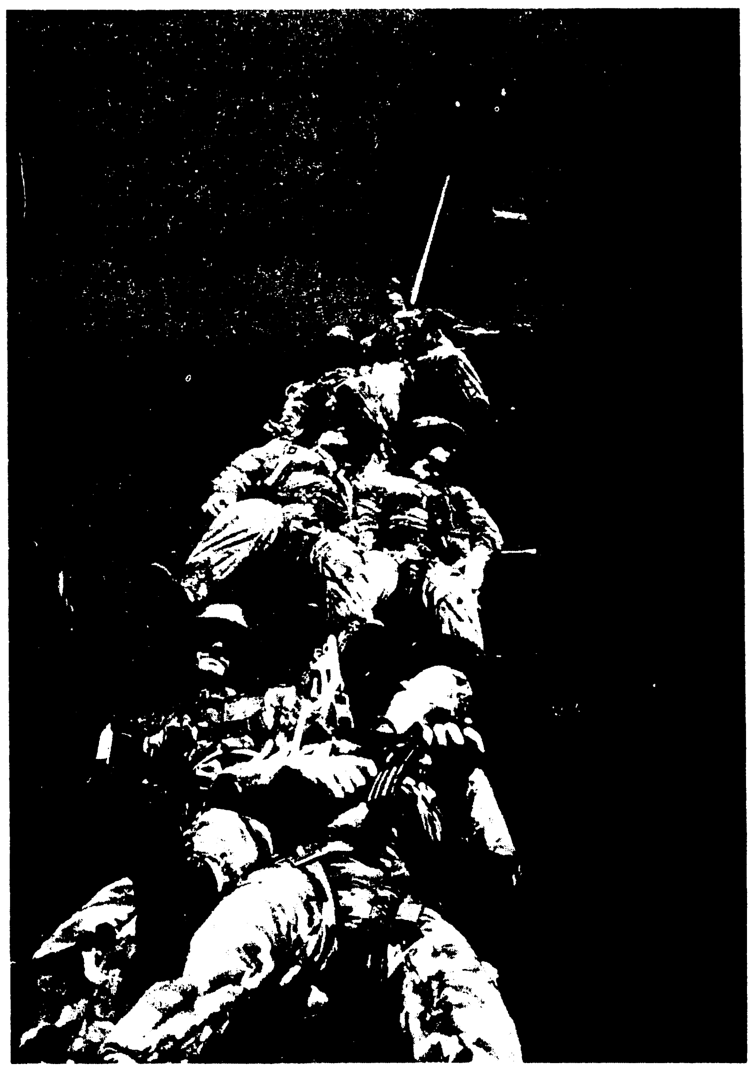


Fig 7-3. Marines SPIE out of an area.

In such cases, the withdrawal of the team is not required. The recovery method selected should provide recovery for the team as simply and rapidly as possible with the least probability of detection.

a. Selecting a withdrawal area. The area selected for withdrawal should be easily recognizable by the patrol and the withdrawal forces. This area should allow for the secure exchange of the recognition signal, and it should be an area other than the one used for landing. When the patrol is recovered from an area which friendly forces do not control, the recovery should meet the following additional requirements:

(1) Allow for the undetected approach and retirement of the recovery vehicles.

(2) Provide the secure use of homing signals, if required.

(3) Allow for maneuver or landing of the withdrawal vehicle.

(4) Allow for errors in predicted drift of swimmers or boat teams in the case of coastal recovery areas.

b. Coastal withdrawal areas. As in the selection of coastal landing areas, the predominant factor considered in selecting coastal withdrawal areas is the surf and its effect on swimmers or boat teams. Surf characteristics are evaluated in the same way as for coastal landing areas.

c. Inland withdrawal areas. As in the selection of inland landing areas, the predominant factors to consider in selecting an inland withdrawal area are the known presence and nature of obstacles and the known enemy in the area that may effect the recovery vehicle. Aircraft landing and takeoffs determine the suitability of a withdrawal area when obstacle are present.

d. Coastal withdrawal times. As in selecting the exact landing time, the state of the tide and its effects on surf must be considered when selecting exact withdrawal times. The time selected must be late enough to permit the team to swim or boat from the beach out to the recovery point under the cover of darkness and early enough to allow completion of the recovery at sea before dawn (dusk and prior to dawn).

e. Inland withdrawal times. Selecting an exact time for inland withdrawal is based on predicted winds, visibility, and availability of a recovery vehicle. Winds, however, are not as critical as in selecting landing times.

f. Actions in the withdrawal area. Withdrawal is a very critical phase of the patrol and requires thorough planning, coordination, and rehearsal before the operation. With good timing, the patrol and the recovery vehicle should spend a minimum period of time in the withdrawal area. It is far better for the patrol to arrive early at the withdrawal area than late, since a patrol's late arrival unnecessarily endangers the recovery vehicle. The team should be careful when approaching the withdrawal area and once in the withdrawal site, security is maintained while preparations are made to effect the withdrawal.

g. Selecting alternate areas and times. Alternate landing and withdrawal areas are selected to provide for the possibility of enemy activity in the primary areas. Alternate landing areas are selected in the same manner as the primary and usually lie along the same route which the landing or recovery vehicle will travel. Alternate landing and withdrawal times are selected to provide for contingencies other than increased enemy activity, such as bad weather or increased duration of the patrol.

Lesson Summary. This lesson covered the selection of landing areas, landing times, selection of withdrawal areas, and withdrawal times. The next lesson will cover the landing and withdrawal by helicopters.

Lesson 2. LANDING/WITHDRAWAL OF PATROLS BY HELICOPTER

LEARNING OBJECTIVES

1. Identify the main advantage of performing first light landings in helicopters.

2. Identify the main disadvantage of performing last light landings in helicopters.

3. Using the information provided in a situation, complete a landing zone extract brief.

7201. Helicopter Insertion Times

The insertion is a critical moment for the entire recon team since the landing zone may not be entirely clear of enemy and the team may be met by ground fire and forced to abort the mission. Insertion times using helos is an important part of accomplishing the mission.

a. Communications. After a successful insertion and after establishing communications with the teams; the gunship pilot confirms their exact location. Upon receiving an all secure message from the team and after the team has established radio communications with its base or radio relay, all aircraft will depart the area.

The initial moments on the ground after the aircraft departs the area are critical since a reconnaissance team will usually be engaged within the first hour if the landing has been detected. The first priority is to set up a hasty defense to determine if the enemy is in the area. See figure 7-4 for a sample of a debriefing report.

1. Recon Team: Mike Force 1-5, 1st Force Recon Co.

2. 250830H the team was inserted at GC 816529. After deplaning the insertion helo the team observed 31 enemy approximately 40 meters to the east. The enemy wore mixed green and brown utilities, cartridge belts and bush covers, and carried SKSs and AK-47s. The team initiated small arms fire resulting in eight NVA KIA confirmed. Gunships made four rocket and strafing runs on the enemy with excellent coverage of the target. The team was extracted 250915H at GC 816528.

Fig 7-4. Sample debriefing format.

Either the delivery helicopter pilot or the team leader may abort the mission at anytime before the landing. The HLZ may be changed during the overflight if both the pilot and team leader agree on an alternate HLZ.

> Note: A good deception technique which the delivery aircraft can use is to touchdown a number of times in sequence with the team deplaning the aircraft. Any enemy who are observing may possibly become confused as to the exact location of the team.

b. Landing times. At what time during the day will light conditions, visibility, enemy activity, and weather conditions be such that a helicopter landed patrol will have the best chance of making a semiclandestine entry into its area of operation, clear the landing area without enemy contact, and move undetected to its objective? This is a question that you must answer in selecting a landing time. The S-3 coordinates all activity and provides the patrol leader with information about his mission. For discussing landing times; a day is divided into four general periods: dawn (first light), complete daylight, dusk (lastlight), and complete darkness.

The advantages and disadvantages of making insertions during each of these periods are discussed below.

(1) First light landings. Beginning of morning nautical twilight (BMNT) provides enough illumination to carry out most types of ground operations without difficulty. Visibility is limited to 400 meters or less, and weapons can be employed up to this range. The beginning of morning nautical twilight (BMNT) is predictable and is available from the S-2. Landings made during this period have the advantage in that the enemy cannot observe the helicopter or its landing point from a great distance. Enough light is available for the pilots to orient themselves and see the ground well enough to make a safe landing and takeoff. Also, if the patrol engages the enemy in or near the landing zone and requires reinforcements or extraction, enough daylight is available to facilitate such operations. The main disadvantage lies in the fact that the patrol will not have the benefit of coming darkness to elude the enemy or move undetected from the landing point if natural concealment is not available.

(2) Daylight landings. The landing of patrols by helos during daylight hours have the distinct disadvantage in that the helicopter and its landing point can be observed by the enemy from great distances. Consequently, the patrol's initial position can be ascertained by the enemy which lessens the chance of undetected movement of the patrol to its objective. Daylight landings should not be made unless there is sufficient natural concealment available for the patrol to disappear immediately after landing or when a clandestine entry is not necessary.

(3) Last light landings. End of evening nautical twilight is the time just after sunset that corresponds to morning nautical twilight as far as light conditions and visibility are concerned. The end of evening nautical twilight (EENT) occurs at a predictable time and is available from the S-2. Landings made during this period have the advantage, again, that the helicopter cannot be observed from a great distance. The patrol will have the benefit of approaching darkness to provide concealment and to elude the enemy. Enough light is available for the aircraft pilots to make safe landings and takeoffs. The main disadvantage is that no daylight will be available to facilitate emergency extraction of patrols or provide reinforcements if necessary. The patrol may also have difficulty becoming oriented on the ground in the dark.

Last light landings are planned so that the helicopters arrive over the landing area and make their landings immediately before EENT.

(4) Nighttime landings. Helicopters landing patrols during complete darkness are both difficult and hazardous without terminal guidance assistance from personnel in the landing site. The danger of a night landing is reduced during a full moon. Nighttime landings have the same advantages as last light insertions except that enough light is normally not available for the pilots to make safe landings and takeoffs. One important advantage is that nighttime landings may come as a complete surprise to the enemy.

> Note: Selecting a landing time must be based on a sound estimate of the situation in each particular case. The above discussion is aimed at providing guidelines which you must consider when selecting the landing time.

c. Briefing the pilots. The request for aircraft to deliver a team is made well in advance of the anticipated departure time of the team. The team leader should meet and brief the pilots so that all phases of the landing are thoroughly understood. The team leader should give the pilots the following information.

(1) The enemy situation as the team leader understands it.

(2) Locations of the primary and alternate landing sites by map coordinates.

(3) Information about landmarks that will enable the pilot to locate the landing site. Usually the team leader gathers this information from an aerial reconnaissance or from a previous patrol.

(4) The direction of approach to and exit from the landing site.

(5) The type of approach desired such as a long spiralling approach from a high altitude or a fast direct approach from a low altitude.

(6) The actions the aircraft and the patrol should take in case the enemy is encountered during landing.

(7) Confirm radio frequencies and call signs, time of pickup, time of departure, and other previously coordinated information.

(8) Request that an additional microphone and set of earphones be present in the flight leader's aircraft to allow the team leader to talk with the pilot during flight.

d. Patrol actions airborne. Key patrol members station themselves near a window or door of the aircraft to observe the terrain below and remain continuously oriented while airborne and enroute to the landing area. The patrol leader rides up front with the pilots and talks with them through the intraplane communication system, so that everyone has the same view of the HLZ and surrounding area. As soon as the patrol leader locates the landing site, he quickly confirms its location and points it out to the pilot using verbal descriptions. If the pilot has difficulty in locating the site, the patrol leader gives directions to the pilot for a course change that will bring the aircraft over the site. Once the pilot positively locates the correct landing site, he will notify the other planes in the flight and begin his final approach. Troops aboard the helicopters make preparations for deplaning, last minute reconnaissance of the landing site, and surrounding terrain all the way into the touchdown landing.

e. Artillery and naval gunfire. Artillery or naval gunfire targets should be planned in and around primary and alternate landing sites. If the enemy is encountered in the site, fire support will immediately be available to destroy or neutralize him.

Now that we have covered the various information on the landing and withdrawal of recon teams by helicopter, let's review. What is the main disadvantage of performing last light landings?

____

If you answered that no daylight will be available to facilitate emergency extraction of patrols or insertion of reinforcements, you are correct.

7202. Recovery of Teams by Helicopter

If at anytime the enemy detects the team's presence, a decision must be made concerning possible recovery. If a team is compromised, transports and gunships should be "fragged" for recovery. At the same time, an alert is issued for possible reinforcements (reactionary force). The aircraft establishes radio contact with the team enroute to the recovery area. When they arrive in the area, visual contact is established by strobe lights or signal mirrors. The gunships make gun runs on the suspected enemy positions during the pickup.

The recovery of a team is risky because the team and the recovery helicopter are both very vulnerable to an enemy attack when the team abandons its position on the ground to board the aircraft. Once the team is aboard the helicopter, the transport helicopter departs the area to evade the enemy.

a. Preparations for recovery. After the patrol has accomplished its mission in the objective area, it moves to the tentative HLZ area for recovery. Care is taken to ensure that the enemy is not following. The team arrives in the recovery area early enough to place the zone under distant observation and to detect signs of the enemy. Shortly before recovery time, the patrol moves into the HLZ, establishes security, and physically reconnoiters the zone to ensure that it is free of the enemy and is suitable for use. If obstacles must be removed, plans and preparations are made to accomplish this in minimum time just before the helicopters arrive. A HLZ extract brief is required each time a helicopter lands in your HLZ. Tactical tips which may prove helpful in assisting the aircraft into the HLZ are as follows:

(1) Do not talk in military mumbo jumbo. Remember that pilots are interested in information for accomplishing the mission and saving lives, not how fancy you can talk on the radio.

(2) Prepare your brief before the helicopter arrives.

(3) Be prepared to mark the HLZ on command.

(4) Shield all strobe lights from the enemy.

(5) If a helicopter receives fire while in the approach, tell the pilot from which direction and the type of fire he is receiving.

(6) Give the pilot an accurate picture of the situation on the ground.

(7) Use compass azimuths when discussing direction. If this becomes too confusing to you or the aircraft, then refer to the clock method of direction.

b. Landing zone extract brief. Below is a list of information which the pilot will want to know. If some items do not apply, eliminate them. Make the brief as clear, concise, and as short as possible. In addition to the items listed, you may feel the need to pass additional information to the pilot. This is perfectly acceptable as long as it has a bearing on the extraction.

Figure 7-5 on the following page shows an example of a landing zone extract brief.

(1) Situation. The situation on the ground as it applies to the team's extraction, resupply, etc.

(2) Landing zone position. Given as grid, along with prominent terrain features, if possible.

(3) Landing zone description. For the landing zone description give the following information:

(a) Size and shape

(b) Elevation of the HLZ

(c) Any obstacles

(d) Wind, speed, and direction.

(e) Zone markings, panels, and smoke lights.

(4) Enemy positions. Give the distance and direction from the HLZ.

(5) When last fire received. Time and location that enemy fire was received.

(6) Location, direction, distance, and type of fire received.

(7) Supporting arms in progress. Any supporting fires which may be in progress.

(8) Approach direction. Best direction for the helo to approach the HLZ.

(9) Departure direction. Best direction for the helo to depart the HLZ.

1. SITUATION	____________________
2. ZONE POSITION	____________________
3. ZONE DESCRIPTION	____________________
4. ENEMY POSITIONS	____________________
5. WHEN LAST FIRE RECEIVED	____________________
6. LOCATION, DIRECTION, DISTANCE, TYPE OF FIRE RECEIVED	____________________
7. SUPPORTING ARMS IN PROGRESS	____________________
8. APPROACH DIRECTION	____________________
9. DEPARTURE DIRECTION	____________________

Fig 7-5. Blank landing zone extract brief.

> Note: Depending on the information requested from the pilots and different unit SOPs, information in the extract zone brief may vary slightly.

Lesson Summary. This lesson covered landings and withdrawals by helicopters. Specific information covered in this lesson includes landing times, actions while airborne, and briefing the pilots. The next lesson will cover inflatable boats.

Lesson 3. INFLATABLE BOATS

LEARNING OBJECTIVES

1. Given a diagram of the Zodiac F-470 with numbered parts, match the numbered part to its correct name.

2. Identify the basic characteristics of the Zodiac F-470.

3. Given a diagram of the Zodiac F-470 with numbered positions, match the numbered position to the appropriate job.

4. Given a list of rubber boat commands, match the command to its appropriate definition.

7301. Nomenclature of the Inflatable Boat

There are basically two types of rubber inflatable boats used by Marine Corps reconnaissance units. These boats, Combat Rubber Raider Craft (CRRC), are the Zodiac F-470 and the Avon 450.

a. The Zodiac F-470. The F-470 can be inflated or deflated from a single point with compressed air or CO2 inflation system. It has interchangeable flooring which can easily be adapted from a nonrigid to rigid flooring system. The Zodiac and the Avon are primarily used to perform the same tasks. When the CRRCs are used, outboard motors are sometimes used. Instead of paddling for hours to get to the ORP or checkpoints, the outboard motor allows the team security by speed. Some of the capabilities of the CRRCs are listed below.

- Insertion/extraction of recon teams
- Riverine operations
- Easily used in heliborne operations
- Easily launched/recovered by U.S. Navy vessels
- Provide platforms for diving operations
- Used as safety boats for various training operations

Specifications for the Zodiac F-470 are shown on the following page.

DESCRIPTION	DATA
Overall length	15'5"
Overall width	6'3"
Inside length	10'10"
Inside width	3'0"
Tube diameter	1'8"
Personnel capacity	10 Marines
Max payload	2710 lb
Max engine horse power w/standard slated deck	40 hp short shaft
Max engine horse power w/optional aluminum deck	65 hp short shaft
Weight w/standard slated deck	2651 lb
Weight w/optional aluminum deck	2651 lb
Weight of CO2 bottle charged	45 lb
Number of separate compartments	8
Dimensions in bag	59x29.5in

Below and on the following pages are the different parts of the F-470. The number next to the nomenclature will coincide with the craft part in (fig 7-6 and 7-7).

(1) Thrust board. The thrust board is permanently installed on the bow section of the boat. The purpose of the board is to provide stability.

(2) Valves. There are two CO2 valves installed in the aft interior of the boat. These valves are used for rapid inflation by a system of four intercommunicating valves.

(3) Rubbing strakes. Rubbing strakes are designed to protect the sides and underparts of the hull from abrasions.

(4) Sheath. The sheaths are designed to hold the six soundproofed paddles that come with the boat.

(5) Transom. The transom, which is located aft between the two main tubes, is designed to accommodate short-shafted outboard engines 35 to 65 hp. Attached to the transom are two sock type self-bailers which are installed to rapidly and continuously drain water from the floorboards and from under sections of the boat.

(6) Floorboards. There are two types of floorboards. They are the wooden or slatted deck and the aluminum deck.

(a) Wooden deck. The wooden or slated deck is designed to enhance the rapid deployment concept. It is completely removable and comes installed by the factory so that it rolls normally with the fold of the boat.

(b) Aluminum floorboards. These are used when the boat requires a higher rate of speed, mobility, maneuverability, and better control. The aluminum floorboards are comprised of four light weight aluminum panels which are locked in with two self-locking, securing aluminum stringers.

(7) Pouches. Two water resistant pouches are installed for dry storage of sensitive material.

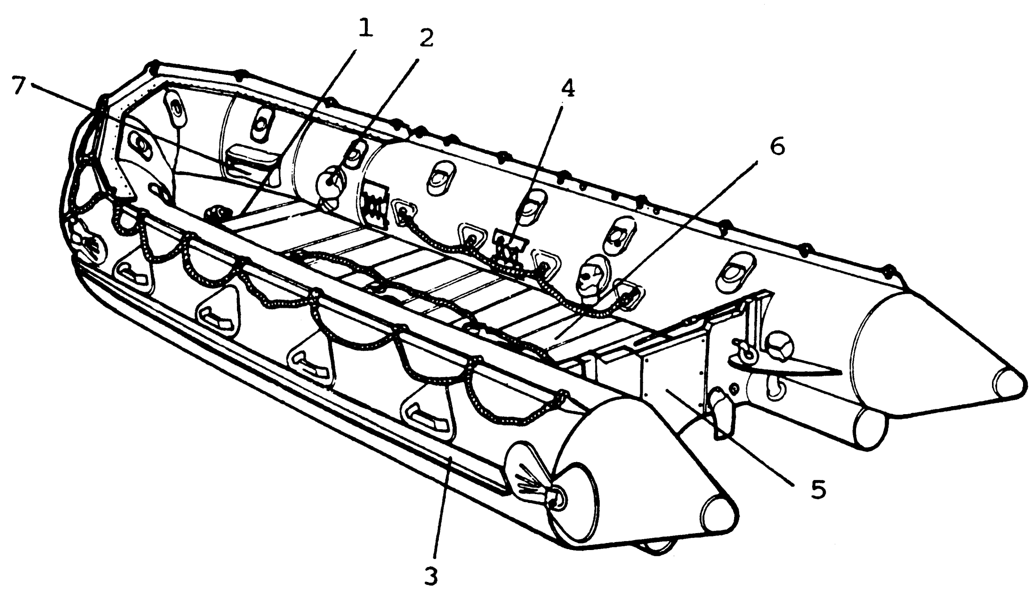


Fig 7-6. The Zodiac F-470 rubber boat, angle view.

(8) "D" Rings. There are four "D" rings, two on the bow and two on the aft. These "D" rings are installed for towing. There are thirteen other "D" rings installed on the inward side of the main tube. These rings are multipurpose, they are used for lashing radius and troop equipment.

(9) Hull. The hull is a large tube which gives the F-470 its main support and U shape. The hull is divided into 8 airtight chambers. The main tube has 5 chambers; the inflatable keel has 1 chamber.

(10) Keel. The keel is located on the bottom of the boat, centered forward to aft. There is one inflatable keel which improves the directional stability of the boat and provides for a comfortable ride.

(11) Lifeline. Lifelines are located on the main tubes, and have three functions.

(a) Used as a grabline to support personnel when overboard.

(b) Used to stabilize oneself while in the boat.

(c) Used when lashing and securing equipment.

(12) Carrying handles. Used to carry the CRRC when inflated, or to get it out of the package when not inflated.

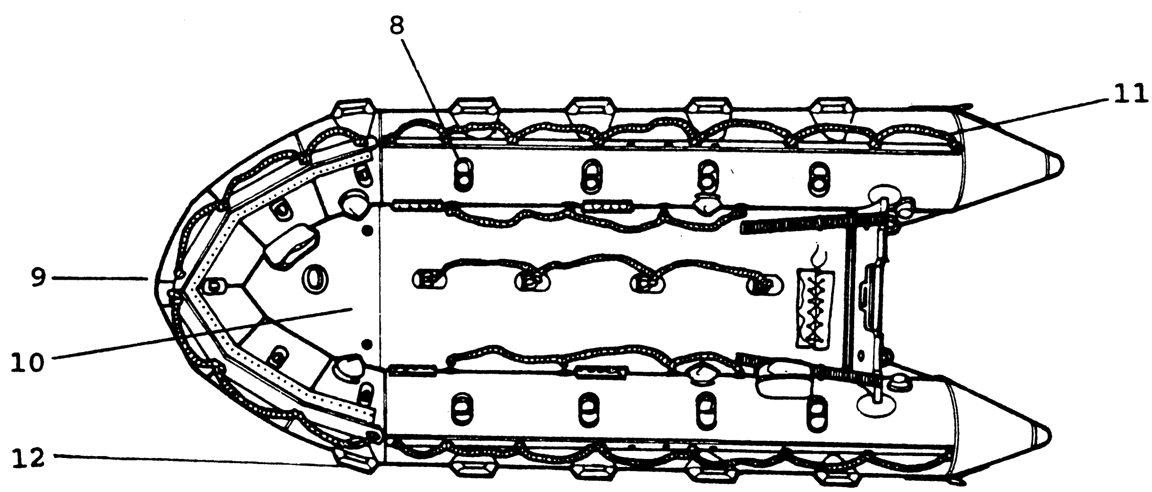


Fig 7-7. The Zodiac F-470 rubber boat, top view.

b. <u>The Avon 450</u>. The Avon 450 is a rapid deployment craft with many of the same features as the Zodiac F-470. Since the basic terminology is the same, we will not cover the Avon 450 in detail. The specifications of the Avon are shown below.

DESCRIPTION	DATA
Overall length	14'9"
Overall width	6'8"
Inside length	10'5"
Inside width	3'0"
Tube diameter	1'8"
Personnel capacity	8 Marines
Max payload	2200 lbs
Max engine horse power	40 hp short shaft
Dimensions in bag	26x20x52in
Dimensions in bag w/hp inflation system	28x21x52in
Approx weight w/slatted deck	199 lbs
Approx weight w/hp inflation system	264 lbs
Weight of CO2 bottle charged	45 lbs.
Number of separate compartments	4+keel
Approx performance w/average load	20 knots
Approx inflation time	10 minutes
Approx inflation time w/hp inflation system	1 minute

Now that you have covered the specifications of the Avon 450, let's move on to the nomenclature.

The nomenclature for the Avon 450 is very much like the Zodiac F-470 so a detailed description of the Avon 450 will not be provided. Two views of the Avon 450 with their coinciding numbered parts, are illustrated in figures 7-8 and 7-9.

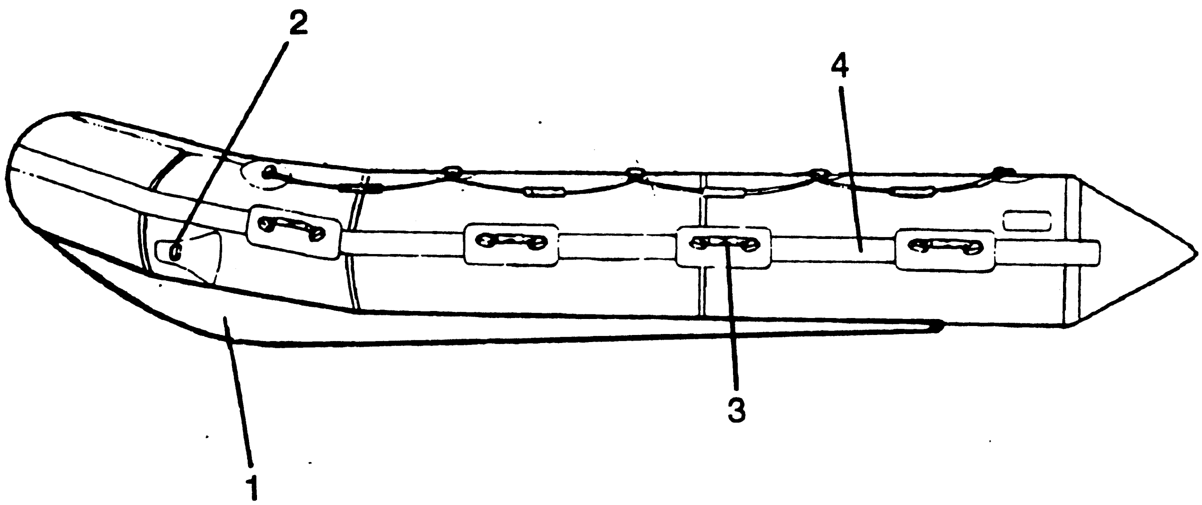


Fig 7-8. The Avon 450 rubber craft, side view.

Number	Nomenclature
1	Inflatable keel
2	Forward towing ring
3	Carrying handles (4 each side)
4	Rubbing strake

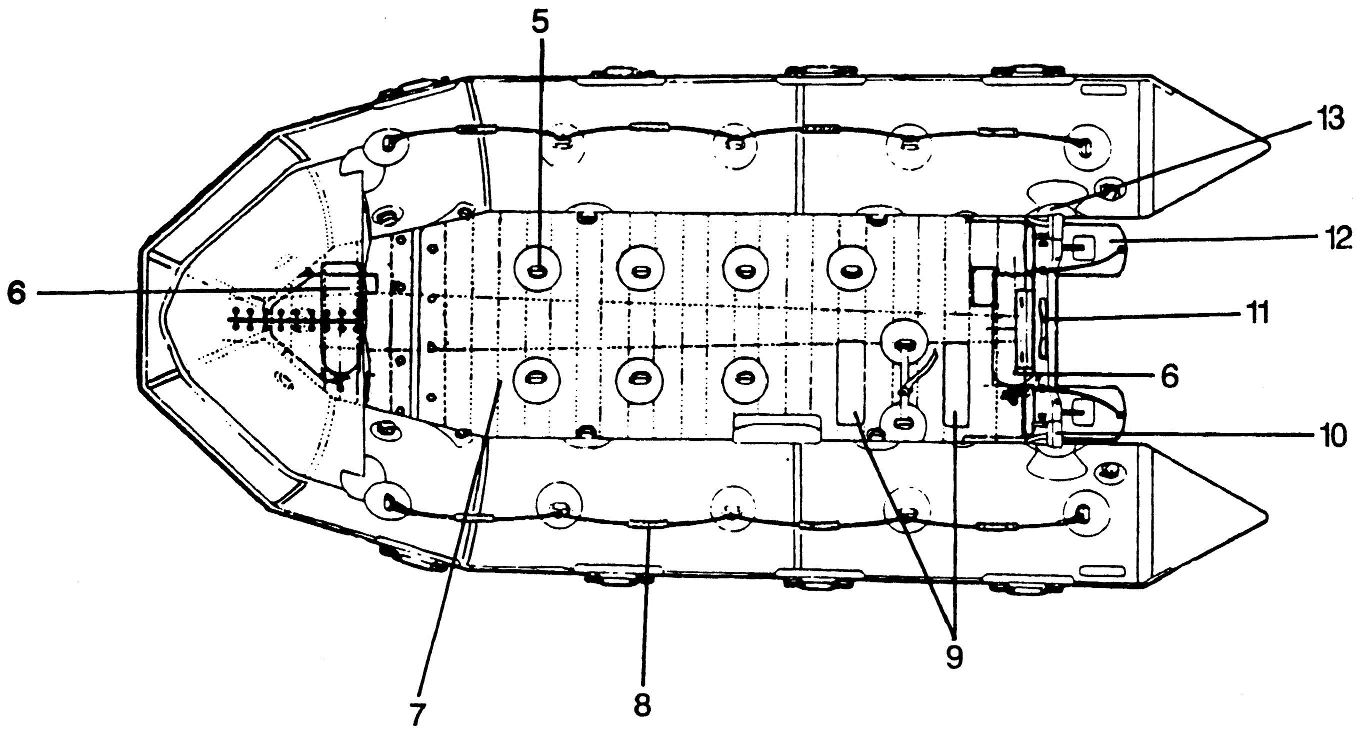


Fig 7-9. The Avon 450 rubber craft, top view.

Number	Nomenclature
5	"O" rings and tie down lash points
6	High pressure inflation systems
7	Deck-integral, fabric or aluminum
8	Lifeline w/grip handles
9	Fuel tank retention pads and straps
10	Aft towing eyes
11	Motor clamp plate
12	Drain ports
13	Davit lifting ring (1 on each side)

7302. Boat Crew Organization and Equipment

A boat team consists of the boat crew and passengers. The crew of an inflatable boat will carry as many men as needed to accomplish the mission, up to the maximum payload for the craft. The recon team consists of six Marines but, as many as ten men can fit in a boat. For an eight man crew, the boat is organized with a coxswain, an assistant coxswain, and six paddlers.

a. Crew organization. The boat crew is organized with three paddlers along each side of the boat. The starboard paddlers are numbered one, three, five, and assistant coxswain. The port paddlers are numbered two, four, six, and coxswain (fig 7-10). For the ease of explanation, the assistant coxswain is number seven and the coxswain is number eight in this illustration, but they are not usually assigned numbers. If passengers are carried, they are numbered consecutively from stern to bow starting with number nine. All boat team members are addressed by their number. When the coxswain wishes to address a command to a pair of paddlers, he may use the term "ONES," "TWOS," and "THREES" to indicate crewmembers number 1, 2, and 3. When the numbering of the boat team is by pairs, it is known as the "short count"; when the numbering of the boat team is by individuals, it is known as the "long count."

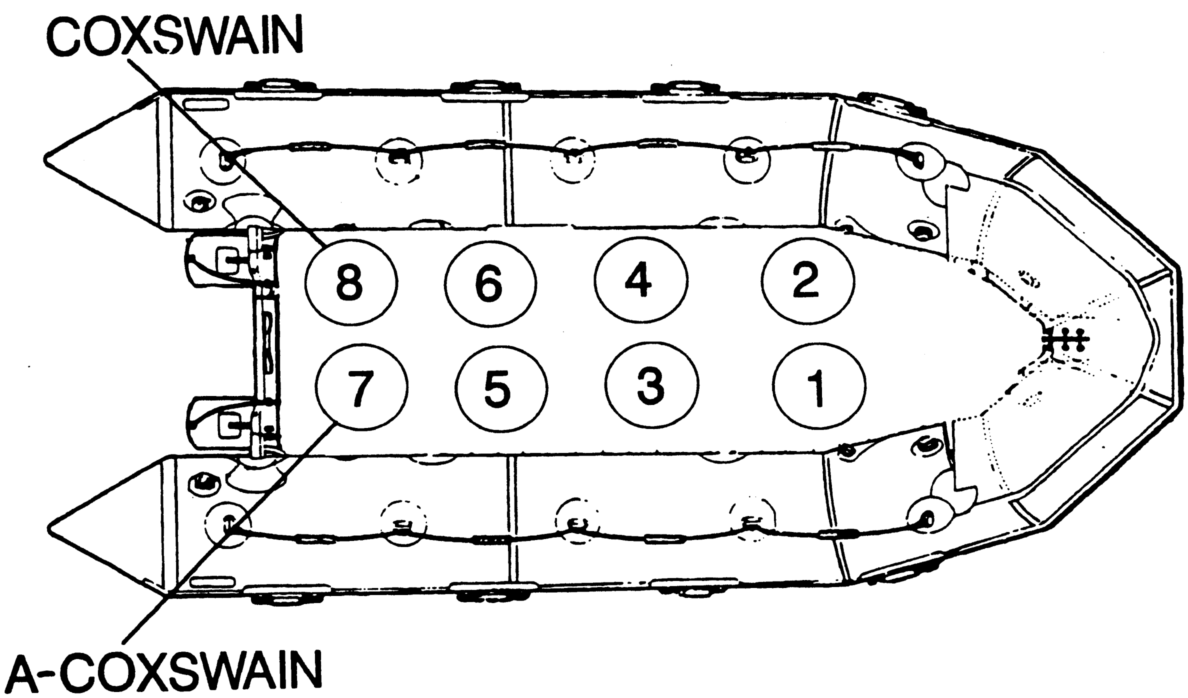


Fig 7-10. Boat crew organization.

b. Duties and responsibilities of team members. The duties of each man while in the rubber craft are listed below.

(1) Number 1 is the navigator. He assists the coxswain in keeping the boat perpendicular to the breakline when launching the boat. He assists the coxswain in avoiding obstacles in the water and acts as a signalman when beaching the craft.

(2) Number 2 also assists the coxswain in keeping the boat perpendicular to the breaker line and in avoiding obstacles. He handles the towline and quick release line during towing operations.

(3) Numbers 3 and 4 are responsible for lashing and unloading equipment in the boat. They are used as scout swimmers during tactical boat landings. They are also responsible for detaching paddles for immediate action drills.

(4) Numbers 5 and 6 assist in lashing and unloading of equipment in the aft section of the boat. They assist the coxswain in maneuvering in swift currents. They are also responsible for detaching paddles for immediate action drills.

(5) Number 7, the coxswain, is responsible for the performance of the crew, the handling of the boat, and the distribution of equipment and passengers in the boat. He issues all commands to crew members, maintains course and speed, and operates the outboard motor if it is used. The coxswain can designate an assistant coxswain (a-coxswain). The a-coxswain assists the coxswain in any designated duties.

(6) During boat team training all members of the team will not display the same aptitude for boat handling. It is not necessary that all members acquire the same degree of boat handling proficiency. When a boat team is formed for an operation as opposed to a boat training exercise, the man chosen as coxswain should be the one with the greatest ability as a boat handler. The one chosen as the stroke should be selected for his strength and ability to maintain a steady rhythm.

c. Individual equipment. The uniform and equipment carried by each boat team member is specified by the patrol leader; however, there are some general rules to observe. When 782 gear is worn by team members in the boat, it should be prepared as for any amphibious operation and should be easy to jettison as if the wearer falls overboard. Weapons should be slung diagonally across the back, muzzles up, and pointing outboard.

Rifle slings are threaded through the upper sling swivel in the opposite manner than normally threaded so that the free end of the sling is not between the sling and the rifle stock. The sling keeper is installed so that the latch is outboard also. An upward pull on the free end of this sling will release the keeper and the rifle. All boat team members wear inflatable lifejackets. Every man should wear a hunting knife and a one cell distress light on his lifejacket for night operations. For cold weather operations, personnel may wear rubber wet suits. These provide considerable warmth and buoyancy while in water, but restrict paddlers' movement somewhat and may cause chafing in the armpits. Rubber tennis shoes should be worn for foot protection. For extended operations ashore, each man should carry a field uniform and boots to be worn after the landing has been made.

d. Stowing organizational equipment. All organizational equipment that is not worn by the boat team, such as machineguns, radios, and demolitions, must be placed in waterproof bags and stowed and lashed securely in the boat prior to launching. Sharp corners and projections on equipment are padded to prevent damage to the boat.

Let's review. What do you call the Marine who is responsible for the performance of the crew and the handling of the boat?

____

If you answered the coxswain, you are correct.

7303. Inflatable Boat Commands

The coxswain forms the boat team with the command, "TEAM, FALL IN." The boat team forms facing the coxswain in a column of twos. The crewmembers assume the relative positions they will occupy in the boat. After the team has formed, the coxswain commands, "TEAM, COUNT OFF." All hands sound off with their position numbers in order, including the coxswain, who is number 7. Keep in mind that once a recon team has worked together and is proficient with the duties, the boat crew will work like a well-lubricated machine. Many of the commands mentioned will not be needed simply because unit integrity will take the place of the commands.

a. Preparatory commands. The coxswain will issue preparatory commands to indicate the persons who will execute the following command. In some instances, the preparatory command will include the expression "STAND BY TO..."

b. Boat handling commands. On the following page are listed the commands you would receive from the boat coxswain.

(1) LOW CARRY. Crewmembers lift the boat to about knee height by carrying handles while facing forward.

(2) HIGH CARRY. Crewmember lift the boat to about head height. Each man places the boat on his inboard shoulder while maintaining his grip on the carrying handle with his outboard hand.

(3) GIVE WAY TOGETHER. Paddlers stroke in unison, following the rhythm set by number 1.

(4) HOLD WATER. Paddlers hold their paddles motionless in the water with the blade perpendicular to the direction of motion.

(5) BACK WATER. Paddlers paddle backwards in unison with the number 1.

(6) REST PADDLES. Paddlers rest their paddles across their legs.

c. Launching the boat. The boat is launched bow first whenever the water is shallow enough for the team to wade in carrying the boat at low carry; e.g., launching the boat in surf. The boat is launched stern first when the water is too deep for wading. This means launching the boat over the side of a larger boat or from the steeply sloping bank of a river. All equipment is waterproofed, stowed, and lashed in the boat prior to launching. The coxswain commands, "CREW TO STATIONS." Crew members form alongside the boat in their relative boat positions facing the sea. The coxswain then commands, "STAND BY TO LAUNCH BOAT, LAUNCH BOAT." On the preparatory command "STANDBY TO LAUNCH," the team members will grasp the carrying handles; on the command of execution, "LAUNCH BOAT," team members will execute low carry and move into the water.

(1) Launching CRRC in the surf without engine. The coxswain will observe the surf conditions and launch the boat during a period of light breakers. The coxswain can use any rip current to his advantage to assist the crew in traversing the surf zone. When numbers one and two are about thigh deep in water, the coxswain will order them to board. As soon as they are aboard they will commence paddling and then this procedure is continued for the next pair of paddlers in turn until all personnel are in the boat. As each pair of paddlers enters the boat, the remaining in the water are assisting by pushing the boat seaward and keeping it perpendicular to the breaker line. After the coxswain is aboard, the crew continues to paddle seaward in an attempt to get beyond the surf zone before the next series of breakers begin.

If a breaker is approaching the boat at any time during this sequence of events, the men inside the boat must lean forward, stay low and hold on to the boat, pushing their weight forward in an effort to keep the boat from broaching.

(2) Beaching CRRC in the surf without engine. The coxswain observes the surf and rip currents and beaches the boat during a period of light breakers. The boat must remain perpendicular to the breaker line through the control of the coxswain and the bow men. Using various orders, the coxswain will vary the speed of the boat to avoid any plunging breakers. The a-coxswain (assistant) keeps a constant eye on the breakers coming into the aft and advises the coxswain of any shifts in wave patterns or size. None of the other men in the boat should look seaward since this will cause the boat to crab (foul the paddling). The crew must paddle strongly as each wave raises the boat in order to take advantage of the wave's momentum. During a period of unavoidable large breakers the team must keep paddling but try to lean as far to the aft as possible to keep the aft of the boat from being lifted and causing the boat to capsize nose first. Once the boat is in approximately thigh deep water the coxswain will order the men out of the boat in pairs as they entered with the "ones" exiting first and so on. The individuals must keep their paddle in their hand so that it does not get washed out of boat and lost in the surf. Once the men enter the water they will assist in keeping the boat perpendicular to the breaker line moving it toward the beach.

(3) Launching CRRC in the surf with engine. The coxswain will wait for a period of light breakers to launch the boat. This time the coxswain and a-coxswain will be the first to enter the boat on command of the coxswain. The coxswain will have the "kill chord" attached to his wrist in the event of an emergency such as capsizing, the chord will automatically come off and kill the engine. The coxswain attaches it to the engine. At the same time, the a-coxswain will let the tilt lever down and put the engine down. He will start the engine only when the coxswain ensures that all men are safely inside the boat. Then and only then will the coxswain give the a-coxswain the command to put it in forward. All of this must take place very quickly so that the boat is in forward and the coxswain has control before the boat has a chance to stray from being perpendicular to the breaker line.

(4) Beaching CRRC in the surf with engine. The coxswain will observe the surf and wait for a period of light breakers. He will position the boat immediately behind a wave and follow that one wave all the way to the beach. This will keep the water line higher when the wave breaks so that the boat can be brought closer to the beach and also if the boat is travelling at the same speed as the wave it is not likely that another wave would approach the boat from the aft. When the boat starts to enter the surf zone for beaching, the a-coxswain pulls the tilt lever to the up position leaving the engine down. The number one man raises his arm high so that the coxswain can see it clearly. He will watch for obstacles and guide the coxswain to go to the left or right simply by motioning with his hand. The number one man will then estimate when the engine is just about to touch bottom and he will drop his arm in a sharp distinct manner. This is the signal for the coxswain to pull the "kill chord" and cause the engine to die, and also for the a-coxswain to immediately lift the engine to the up position. All of this should be done at a fairly good speed so that once the engine is killed and lifted there should still be enough momentum to beach the boat.

Reconnaissance units use the 35 and 65 horsepower outboard motors. Prior to launching the CRRC with mounted engine, items that need to be checked are listed below.

- Kill chord is connected
- Engine is in neutral
- Fuel bladder and lines are not pinched and fuel line is connected
- Carburetor not fully flushed
- Engine not primed enough if cold
- Engine primed too much (flooded) if warm
- Drain purge valve open
- Spark plugs damaged or fouled

d. Overturning and righting the boat in the water. A coxswain may wish to empty a swamped boat by overturning it, or he may wish to right a capsized boat. A boat is overturned and righted by the same procedure, which is referred to as broaching the boat. All but three members of the boat team and the coxswain, who holds all the paddles, stay in the water during the overturning or righting.

Lines are passed through the carrying handles along one side of the boat. The three remaining paddlers grasp these lines, stand on the opposite side of the boat, and fall backward into the water. They are assisted as necessary by the three paddlers in the water. The command "BROACH BOAT" is used in training to cause the boat team to overturn the boat in the water.

e. Taking the boat out of service. Remove all loose gear, including the motor mount, if it has been used. Clean the boat thoroughly and dry the boat's entire surface. Then open all valves. After the boat has been thoroughly deflated, close all valves and stow all equipment.

f. Maintenance. Store the boat in a cool, dry area. Do not store near steam pipes, furnaces, or boilers. Keep the boat free from oil or damp areas. Periodically, open the boat and inflate it with dry air when time permits. The obvious things to check for are listed below.

(1) Test for any damage which might cause leakage.

(2) Examine for cuts and other fabric injuries, especially for abraded areas caused by excessive rubbing of the boat against rough surfaces.

(3) Weigh CO_2 cylinders to check for correct charge. The correct weight is stamped on each cylinder. Due to constantly changing gear, you must read the boat manual and perform the correct preventive maintenance.

(4) Blow air through the manifold to ensure air passes through each compartment.

(5) Keep inflation and deflation valves lubricated with either silicone or vaseline to prevent rusting and freezing.

(6) Wash the inflatable boat with fresh water after use in salt or muddy water.

(7) Inspect all parts and accessories, then repack the boat.

Lesson Summary. This lesson covered utilizing rubber crafts for insertion and extraction. Also, information was provided on the types of crafts used by recon units and how to use them.

Lesson 4. LANDING/WITHDRAWAL FROM A SUBMARINE

LEARNING OBJECTIVES

1. List the two methods used for debarkation while aboard a submarine.

2. List the five methods used for vectoring/homing a submarine for withdrawal.

7401. Embarkation Preparation

Boat teams conduct tactical exercises during training to demonstrate and improve their boat handling ability under operational conditions. All members of the team are trained to perform the duties of all other members during these boat training exercises. Submarines may be used to transport reconnaissance teams to the vicinity of their operation areas. The teams will swim or boat from the submarine into their RAOs. The ability of the submarine to operate while submerged and the ability of the team members to lock-out (debark) and lock-in (embark) while the submarine is submerged makes the submarine ideal for the landing and withdrawal of teams for clandestine operations along coastal areas. Reconnaissance teams may be deployed from either nuclear powered or diesel submarines. Depending upon which one is used, special consideration must be given to the techniques of debarking and withdrawal. This section discusses the planning required for operations from a conventional submarine and the procedures employed by swimmers and boat teams.

a. Liaison. Before embarkation planning begins, a liaison visit is made to the submarine to ascertain the characteristics of the particular submarine. This liaison visit is necessary because differences exist in both internal and external configuration among the various classes of submarine as well as among submarines of the same class. Some of the information that should be coordinated with the submarine commander during the liaison visit are listed below.

(1) Time and place of embarkation

(2) Number of troops to be embarked

(3) Location and capacity of cargo storage areas and amount of cargo to embark

(4) Accommodations for embarked troops

(5) Communications support available from the submarine and compatibility of such communications equipment, such as types of radio sets and frequency range

(6) Mission and concept of the operation to include enemy and friendly situations

(7) Special equipment needed by the reconnaissance troops to carry out debarkation and recovery operations such as towing bridles, towing lines, scuba and swimming equipment, and signal lights

(8) Time and place of debarkation and recovery of reconnaissance teams, and type of debarkation and recovery procedures to be used

(9) Miscellaneous information such as general capabilities and limitations of the submarine, fire support available aboard the ship, and medical support available

b. Preparation for troop embarkation. Reconnaissance Marines should be embarked aboard submarines for the shortest time consistent with the requirements of the operation. Embarkation should be conducted at forward bases or at sea near the objective area. Daily troop routine must be compatible with the daily operational routine of the submarine. Conditions aboard the submarine are such that the following restrictions usually apply:

(1) Movement between compartments should be held to a minimum.

(2) Physical exercise, except isometrics, will not be allowed.

(3) Strict water discipline is maintained; expect no laundry and limited shower facilities aboard the submarine.

(4) Marines will be allowed topside only occasionally and then in limited numbers.

(5) All Marine activities will be coordinated between the troop commander and the submarine commander.

(6) Submarine operating procedures are precise and strictly observed. Embarked troops are normally not allowed to participate in submarine operations.

(7) Care should be taken by embarked Marines to avoid creating ill will between the submarine crew and themselves.

7402. Debarkation

Tactical debarkation of swimmers or boat teams may be conducted using two methods: surfaced or submerged. Boat teams usually debark only from a surfaced submarine.

a. Procedures. Regardless of the method used, the following general procedures should be observed:

(1) Crew members and Marines are briefed on the debarkation plan and the specific duties and stations of individuals.

(2) Equipment to be debarked or used during debarkation is inspected and prepared for debarkation prior to manning the debarkation stations.

(3) The crew should man debarkation stations first, the debarking Marines last.

(4) Debarking Marines are oriented in relation to the landing area and briefed on sea and surf conditions.

(5) Rehearsals should be conducted prior to any tactical debarkation.

b. Surface debarkation of swimmers. Swimmers may debark from the conning tower of a partially surfaced submarine. Debarkation of more than one pair of swimmers will usually require that the upper and lower conning tower hatches be opened simultaneously, a practice that is not always safe when partially submerged. The submarine will usually surface with decks awash in such cases. Submarine crewmen will man and open all hatches and assist each pair of swimmers in the handling of equipment. Pairs of swimmers are called topside by number from the control room. If space permits, the first pair of swimmers may take station in the conning tower prior to surfacing. Swimmers debark in pairs with their equipment on the leeward side (side toward which the wind is blowing) of the submarine.

c. Submerged debarkation of swimmers. Swimmers may debark (lock out) through the escape trunk of a submerged fast attack submarine (fig 7-11). Two scuba-equipped swimmers or four surface swimmers can debark through the escape trunk at one time. Duties of crew members include trunk operation or supervision thereof, and the manning and opening of the lower hatch of the escape trunk. The use of the escape trunk, lock out/lock in procedures by Marines is done under the cognizance of a SEAL detachment, mainly due to their ability to perform authorized checks of the air system. Swimmers form in the forward torpedo room with their equipment. Each team enters the escape trunk and floods the trunk from within.

After the team debarks and secures the outside hatch, the crew members drain the trunk and prepare to debark the next team. A scuba tank is often stowed in the trunk with debarking teams for use in case of an emergency. Dry and wet rehearsals should be conducted by the teams prior to debarkation.

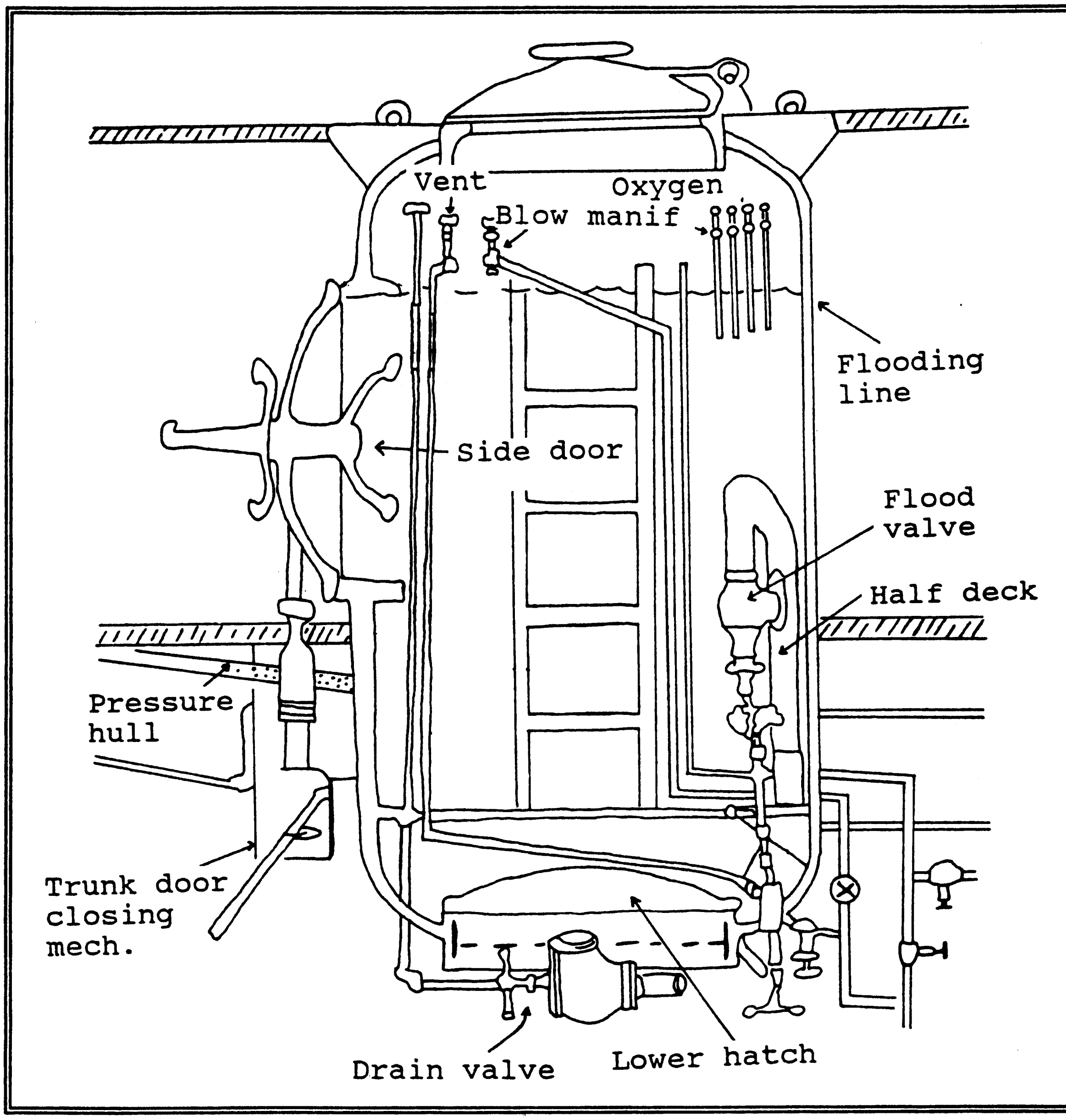


Fig 7-11. The submarine escape trunk.

d. Surface debarkation of boat teams. Inflatable boat teams may debark from a fully surfaced submarine by placing the boats over the side or by loading the boats on the deck and launching as the submarine dives from under the boats. Wet and dry launchings are covered on the following page.

(1) Dry deck launching. When the boats are launched over the side of a fully surfaced submarine, the outboard motor (if used) should be placed in the boat only after it is in the water. All other equipment (waterproofed) is loaded and lashed prior to launching. Boats should be launched from the leeward side of the submarine and may be launched from either forward or aft of the conning tower. Debarkation of troops is expedited if the boats are positioned to take full advantage of hull appendages which offer handholds and footholds. The boat is launched stern first and loaded by the long count from the bow.

(2) Wet deck launching. Another method of surface debarkation of boat teams is by the submarine submerging from under the fully loaded and manned inflatable boats. The inflated boats are arranged on the deck of the fully surfaced submarine, either forward or aft of the conning tower. All equipment is loaded and lashed in the boats and the boat teams take their places in the boats. The submarine can be under way or stopped in the water during these preparations. When all boat teams are ready for launching, all submarine personnel go below and prepare to submerge. As the deck of the submarine sinks below the surface of the water and the inflatable boats become waterborne, the boat teams paddle at fast stroke to clear the submerging submarine quickly. Wet deck launching is preferred over dry deck launchings since the boats can be fully loaded and manned before being placed in the water, and the submarine can be underway while all preparations for launching are made. Wet deck launchings require more training and experience than dry deck launchings.

e. Submerged debarkation of boat teams. Boat teams may debark from a submerged submarine in the same manner as swimmers. Duties of crew members include escape trunk operation, or the supervision thereof, and the manning and opening of the lower escape trunk hatch. Two scuba divers are locked out first and release a deflated boat which has been stowed on the main deck, surface the boat, inflate it, and secure it to keep it from drifting. The boat team debarks as swimmers through the escape trunk and lock in. The debarkation procedure commences on order of the submarine's commander.

f. Actions of boat teams after debarkation. After the boat teams have debarked from the submarine, each boat moves a short distance from the submarine and lays to, awaiting the other boats to join. When all the boats are together, they adopt the prescribed formation and begin the movement to the coastal landing area.

(1) When the distance involved is great and the tactical situation allows, outboard motors may be used to facilitate this movement. The noise of pounding surf will partially cover the noise of outboard motors to the enemy personnel located on the beach. However, the possibility of the motor being heard by enemy patrol boats must be considered.

(2) Another method of facilitating the movement of the boat teams from their debarkation point to the coastal landing area is to have the submerged submarine tow the manned boats by a line attached to the submarine's periscope. This can be accomplished when the water is deep enough.

7403. Withdrawal by Submarine

A recovery area is specified by map coordinates and located offshore in water deep enough for safe operation of the submerged submarine. Primary and alternate recovery times are specified. Swimmers or boat teams move to the recovery area upon completion of the mission, arriving early enough to prepare for recovery. When they arrive, they initiate prearranged signals to enable the submarine to locate their precise position. Upon rendezvous with the submarine, they are normally towed by the submerged submarine out of the recovery area where embarkation can be effected safely.

a. Vectoring or homing. It is unlikely that physical contact between Marines being recovered and a submerged submarine can be made at night without using a vectoring or homing device. The swimmers or boat teams can easily locate themselves in the offshore recovery area by intersection with use of the lensatic compass and landmarks or navigational devices located on the shore. Five techniques used for vectoring the submarine to the troops to be recovered are discussed below.

(1) Percussion grenades. An expedient method to use is percussion grenades. The first grenade that explodes in the water gives the submarine the heading to the recon team. Five minutes later another grenade is exploded to give the submarine the range to the team.

(2) Underwater sound. The submarines's passive listening devices, such as the JT hydrophone, may be used to give accurate bearings to any source of underwater sound provided the sound is sufficiently well-defined to be distinguished above the background noise. The sounds made by striking two lengths of pipe together underwater or by rattling a canteen containing several nuts and bolts underwater can be detected by a submarine up to 2,500 meters away. The signals should be initiated at the prescribed time, maintained for approximately 10

seconds, and repeated periodically about once per minute until physical or visual contact is made with the submarine. On all but the darkest of nights, the submarine should be able to make visual contact with the swimmers or boat teams long before they are aware of the submarine's presence. This is the preferred method.

(3) Radar. Surface search radar may be used to give accurate bearings to an inflatable boat. The effects of sea return at short ranges can be countered by hoisting a portable radar reflector in the boat. However, submarine commanders are very reluctant to activate surface radar in hostile waters because it may reveal the sub's presence to the enemy.

(4) Infrared light. Infrared light may be used as a homing beacon for a boat team equipped with a metascope. The submarine must be equipped with an infrared light source which is activated periodically for the boat team to observe and home in on.

(5) Visible light. Visible light (flashlights) may be used as a beacon for the submarine or the boat team or swimmers to home in on. Visible light of low intensity may be used in conjunction with underwater sound in effecting physical contact between the submarine and the swimmers boat teams. The submarine locates the swimmers or boat teams from a distance using its underwater sound receivers. As it approaches the teams, a low intensity light source can be placed against the eyepieces of the periscope inside the sub and be seen by the troops on the surface. The submarine commander may activate the anchor light on the bow of the submerged submarine in some situations to aid the troops on the surface locate the sub.

b. Surfaced recovery of swimmers. The submarine may surface after the swimmers have made physical contact with it and recover the swimmers via the conning tower or main deck hatch. Surfaced recovery of swimmers may be mandatory when some men are wounded or otherwise physically unable to make a submerged recovery. A surfaced recovery can be effected in a minimum of time if the submarine surfaces with decks awash and recovers the swimmers through the conning tower hatch.

c. Submerged recovery of swimmers. Swimmers may be recovered aboard a submerged submarine either bottomed or under way. A descending line may be rigged from the periscope housing or floating buoy to the vicinity of the escape trunk to aid the swimmer's descent.

Small air tanks or air hoses with demand regulators attached are fastened to the descending lines to provide the swimmers with an air source during descent to the escape trunk.

(1) Submerged recovery. Swimmers descend along the descending line to the vicinity of the escape trunk door. The trunk is flooded, lighted, and opened to receive swimmers prior to commencement of recovery operations.

(2) Underway recovery. Underway recovery of swimmers is essentially the same as a bottomed recovery except that physical contact with the submarine is facilitated by the swimmers stretching a line across the path of the approaching periscope. During this pickup and lock in, the submarine proceeds at a minimum speed of 1 to 3 knots. Recovery of more than four swimmers during a single pass by the submarine is impractical. After the periscope makes contact with the taut rope, the swimmers on both ends of the rope haul themselves hand over hand up to the periscope. A descending line attached from the periscope to the escape trunk is provided to aid the swimmer's descent and lock-in (fig 7-12).

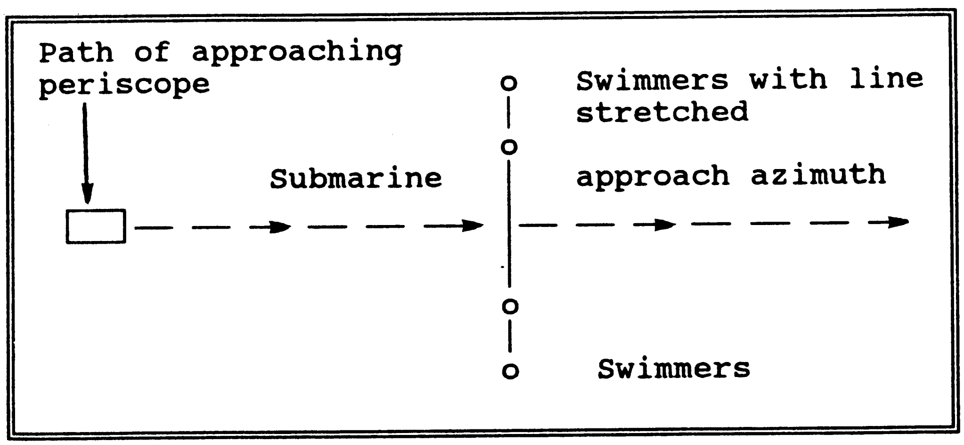


Fig 7-12. Pickup of swimmers for underway recovery.

d. Recovery of boat teams. Boat teams may be recovered aboard a surfaced submarine through the conning tower or a main deck hatch (fig 7-13). Upon arrival in the recovery area, two boats connect a 75 to 100 foot hauling line between them, utilizing towing bridles and the quick-release towing hooks. Additional boats are secured to these boats with towing bridles attached to the aft towing rings of the lead boat and to the forward towing rings of the rear boats. After all the boats have been connected together, the line is stretched taut along an azimuth perpendicular to the azimuth on which the submarine will approach.

As the periscope makes contact with the rope, the boats will be pulled in line behind the periscope. The boat teams may have to maneuver their boats so that they will be together and alongside each other. The submarine will continue towing the boat teams out of the recovery area to a place where the submarine can surface and the troops can embark safely.

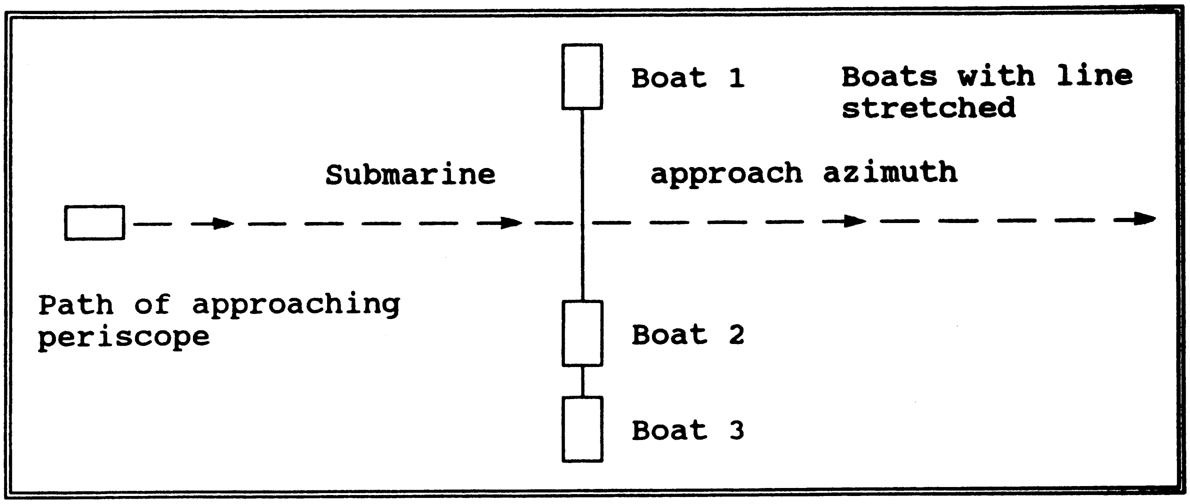


Fig 7-13. Pickup of boat teams for underway recovery.

(1) Wet deck recovery. When the submarine has reached a safe area for surfacing, it signals by such means as a bobbing periscope or blinking light for one of the boats to release its towing hook. The submarine will then surface to a point that its decks are awash. The boat teams maneuver their boats onto the water-covered deck (for or aft of the conning tower), unload, and begin deflating the boats and preparing to stow them. The broached submarine will complete blowing the tanks and surface completely. This enables the boat teams to safely stow their boats away and reembark aboard the sub via the conning tower or main deck hatch.

(2) Dry deck recovery. A dry deck recovery of boat teams is executed in the same manner as wet deck recovery except that the submarine surfaces completely. The boat teams come alongside the sub, unload the boats, and then pull the boats up onto the deck of the sub, and begin preparations to stow the boats. Wet deck recoveries are faster and easier than dry deck, but require more training and experience to execute.

Lesson Summary. This lesson covered debarkation and embarkation from a submarine. It also covered the different methods used to vector a submarine into your position while awaiting extraction.

Unit Exercise: Complete items 1 through 28 by performing the action required. Check your responses against those listed at the end of this study unit.

1. List the four requirements for selecting a landing area.

____

____

____

____

2. List the predominant factors considered when selecting an inland landing area.

____

____

____

3. Inland withdrawal times are based on the availability of

   a. signalling equipment.
   b. ample rations.
   c. a recovery vehicle.
   d. a replacement unit.

4. Identify the main advantage of performing first light landings in helicopters.

   a. The enemy cannot observe the aircraft or its landing point from a great distance.
   b. The pilots are able to follow the roads and dirt trails on the ground.
   c. The pilots are more alert to enemy activity in the morning.
   d. The patrol has the advantage to elude the enemy if contact is made.

5. Identify the main disadvantage of performing last light landings in helicopters.

   a. The helicopter can be observed from a long distance.
   b. The patrol does not have the benefit of approaching darkness.
   c. Fuel consumption is increased by the amount of dry air.
   d. No daylight will be available to facilitate emergency extraction.

6. Your recon team has completed a route reconnaissance. Before calling for the extraction of your team, you need to prepare an extract landing zone brief. Complete the landing extract zone brief on the following page by using the information below.

   - Your team has not been compromised and there are no casualties. The last known enemy position is four kilometers southwest.

   - Contact is not expected.

   - At the present time, there will be no supporting arms.

   - Since the enemy is to the southwest, you recommend the approach direction of the helicopter to be from the northeast and depart to the northwest.

   - Your HLZ position is 120364.

   - The HLZ is flat with one to two foot high brush, it is 300 meters wide, 400 meters long, and the elevation is sea level.

   - There is a very light wind from the north.

   - Panels will be used to mark the HLZ.

1. SITUATION ________________________________

2. ZONE POSITION ________________________________

3. ZONE DESCRIPTION ________________________________
____
____
____

4. ENEMY POSITIONS ________________________________
____

5. WHEN LAST FIRE RECEIVED ________________________________

6. LOCATION, DIRECTION, DISTANCE, TYPE OF FIRE RECEIVED ________________________________

7. SUPPORTING ARMS IN PROGRESS ________________________________
____

8. APPROACH DIRECTION ________________________________

9. DEPARTURE DIRECTION ________________________________

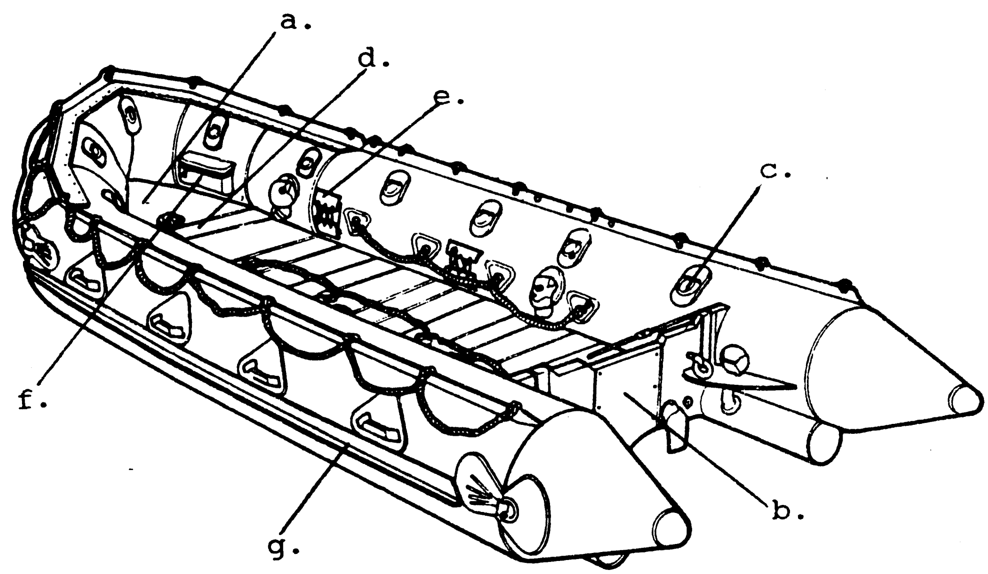
Landing zone extract brief form.

Matching: For items 7 through 13, match the nomenclature in column 1 to its appropriate part in the illustration below. Place your responses in the spaces provided.

Column 1

Nomenclature

____7. Transom
____8. Thrust board
____9. Sheath
____10. Pouch
____11. Rubbing strakes
____12. D-rings
____13. Keel



The Zodiac F-470

14. Identify the troop capacity for the Zodiac F-470 with full tactical load.

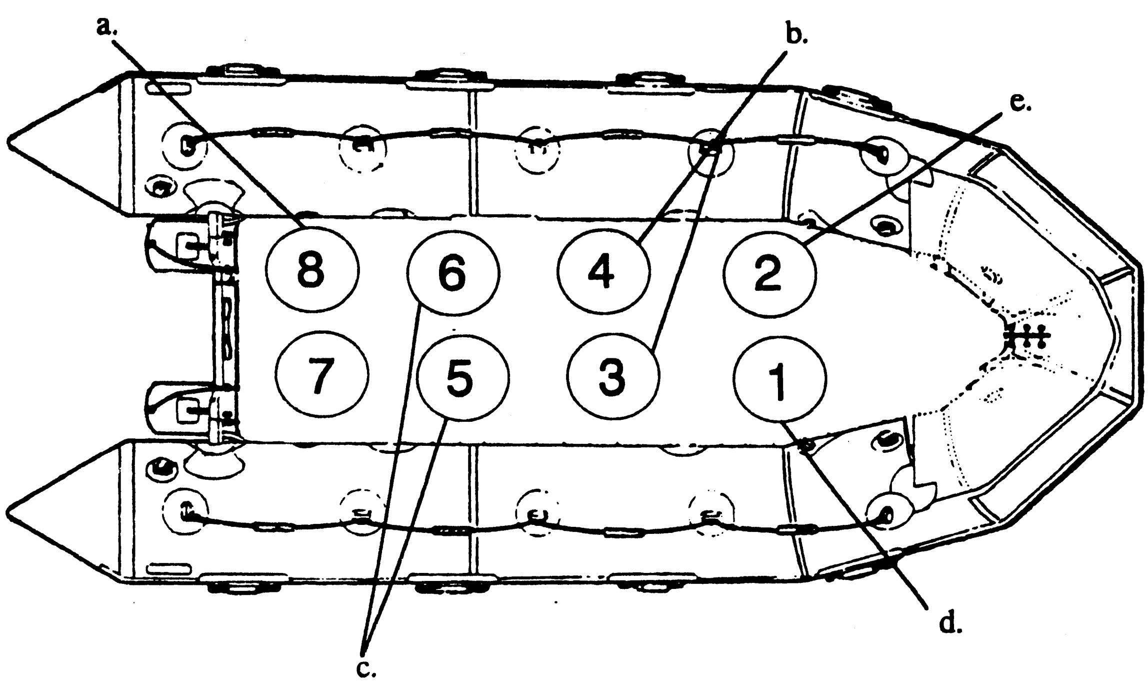
a. 3 Marines
b. 7 Marines
c. 8 Marines
d. 10 Marines

15. Identify the recommended maximum engine horsepower (HP) for the Zodiac F-470.

a. 20
b. 40
c. 50
d. 65

Matching: For items 16 through 20, match the numbered positions on the diagram shown below to the appropriate job description.

____16. These two men shown below are responsible for lashing and unloading equipment in the boat and are used as scout swimmers during tactical boat landings.
____17. This man is the navigator. He assists the coxswain in keeping the boat perpendicular to the breakline when launching the boat.
____18. This man is responsible for the performance of the crew. He issues all commands to the crew.
____19. These two men assist in lashing and unloading equipment, they also assists the coxswain in maneuvering in swift currents.
____20. The passenger, carries out any duties assigned by the coxswain.



Rubber craft diagram.

Matching: For items 21 through 26, match the boat command in column 1 to its definition in column 2. Place your responses in the spaces provided.

Column 1	Column 2
Boat commands	**Command definitions**
____ 21. "GIVE WAY TOGETHER."	a. Crew members lift the boat about knee height by the carrying handles.
____ 22. "HOLD WATER."	b. Paddle backward.
____ 23. "BACK WATER."	c. Hold paddles motionless in water with blade perpendicular to the direction of motion.
____ 24. "REST PADDLES."	d. Paddlers stroke in unison.
____ 25. "LOW CARRY."	e. Crew members lift the boat to head height.
____ 26. "HIGH CARRY."	f. Paddlers rest their paddles across their legs.

27. List the two methods used for debarkation while aboard a submarine.

____

____

28. List the five methods used for vectoring or homing a submarine for withdrawal.

____

____

____

____

____

UNIT SUMMARY

During this study unit, methods of insertion and extraction of reconnaissance teams were covered. Selection of landing areas and withdrawal areas were also covered. Some of the insertion/extraction methods were covered in detail. Although scuba, parachuting, and other methods of insertion/extraction are exciting, keep in mind they are mission-orientated, and simply ways of getting recon Marines from point A to point B expediently.

Study Unit 7 Exercise Solutions

		Reference
1.	Allow the undetected approach and retirement of transporting vehicle. Allow the undetected landing of the patrol. Be recognizable from the transporting vehicle. Be large enough to allow for minor errors in the predicted drift of parachutists, swimmers, or boat teams. Be far enough from the selected initial orientation point so that reasonable errors in patrol navigation or strong winds or currents will not change the initial direction of movement.	7101a
2.	Natural obstacles Manmade obstacles Enemy disposition	7101c
3.	c.	7102e
4.	a.	7201b (1)
5.	d.	7201b (3)
6.	See completed extract form on following page.	7202b
7.	b.	7301a (5)
8.	d.	7301a (1)
9.	e.	7301a (4)
10.	f.	7301a (7)
11.	g.	7301a (3)
12.	c.	7301a (8)
13.	a.	7301a (10)
14.	d.	7301a
15.	d.	7301a
16.	b.	7302b
17.	d.	7302b
18.	a.	7302b
19.	c.	7302b
20.	e.	7302b
21.	d.	7303b
22.	c.	7303b
23.	b.	7303b
24.	f.	7303b
25.	a.	7303b
26.	e.	7303b
27.	Surfaced Submerged	7402

28. Percussion grenades
Underwater sound
Infrared light
Visible light
Radar

7403a

1. SITUATION	The team has not been compromised there are no casualties.
2. ZONE POSITION	Grid 120364
3. ZONE DESCRIPTION	The HLZ is flat with one to two foot high brush, it is 300 meters wide, 400 meters long, and the elevation is sea level. Panels will mark the HLZ.
4. ENEMY POSITIONS	The last known enemy position is four kilometers to the southwest.
5. WHEN LAST FIRE RECEIVED	None
6. LOCATION, DIRECTION, DISTANCE, TYPE OF FIRE RECEIVED	None
7. SUPPORTING ARMS IN PROGRESS.	At present time there are no supporting arms.
8. APPROACH DIRECTION	Since the enemy is to the southwest, you recommend the approach direction of the helicopter to be from the northeast.
9. DEPARTURE DIRECTION	To the northwest

Landing zone extract brief.

RECONNAISSANCE MARINE

REVIEW LESSON EXAMINATION

INSTRUCTIONS: This review lesson is designed to aid you in preparing for your final examination. You should try to complete this lesson without the aid of reference materials, but if you do not know an answer, look it up and remember what it is. The enclosed answer sheet must be filled out according to the instructions on its reverse side and mailed to MCI using the envelope provided. The items you miss will be listed with references on a feedback sheet (MCI R-69) which will be mailed to your commanding officer with your final examination. You should study the reference material for the items you missed before taking the final examination.

Select the ONE answer which BEST completes the statement or answers the item. After the corresponding number on the answer sheet, blacken the appropriate circle.

1. Identify the primary mission of the force reconnaissance company.

   a. Conduct preassault and deep post-assault reconnaissance in support of a landing force
   b. Conduct ground reconnaissance and observation in support of a Marine division and its elements
   c. Harass and slow down enemy movement
   d. Conduct overt intelligence gathering operations for the Allied force

2. Identify the organization of the force reconnaissance company.

   a. Direct action platoon, supply and service platoon, and helicast platoon
   b. Headquarters platoon, supply and service platoon, reconnaissance platoons
   c. Headquarters platoon, supply and service platoon, parachute platoon
   d. Headquarters platoon, headquarters and service company, and reconnaissance platoon

3. Identify the primary mission of the reconnaissance battalion.

   a. Conduct ground reconnaissance and observation in support of a Marine division and its elements
   b. Conduct preassault and distant postassault reconnaissance in support of a landing force
   c. Conduct overt intelligence gathering operations for Allied forces
   d. Harass the enemy by conducting raids and ambushes

4. Identify the organization of the reconnaissance battalion.

   a. Headquarters and service company and direct action platoons
   b. Headquarters and service platoon and reconnaissance platoon
   c. Headquarters and service platoon and direct action platoons
   d. Headquarters and service company and reconnaissance company

5. Identify the organization which selects reconnaissance personnel.

   a. Headquarters Marine Corps
   b. The reconnaissance HQ section
   c. The reconnaissance unit itself
   d. The battalion S-1

6. Identify the four progressive phases of reconnaissance training.

   a. Basic individual training, advanced individual training, basic unit training, and advanced unit training
   b. Unit clandestine training, unit integrity training, advanced unit training, and regimental training
   c. Advanced training, unit training, clandestine training, and integrity training
   d. Basic individual training, advanced individual training, regimental training, and key element training

Matching: For items 7 through 10, match the camera terminology in column 1 to its appropriate definition in column 2. After the corresponding item number on the answer sheet, blacken the appropriate circle.

Column 1	Column 2
Camera terminology	Definitions
7. Shutter speed	a. Combination of ISO, shutter speed, and f-stop setting
8. Aperture	b. A mechanical device that opens and shuts the lens aperture of a camera
9. Exposure control	c. Adjustable opening in an optical instrument that limits the amount of light passing through a lens
10. Depth of field	d. A zone extending in front of and behind the subject that will appear to be in focus
	e. Used for mounting a strobe or socket

Matching: For items 11 through 15, match the nomenclature in column 1 with the correct labeled part in the illustration. After the corresponding item number on the answer sheet, blacken the appropriate circle.

Column 1

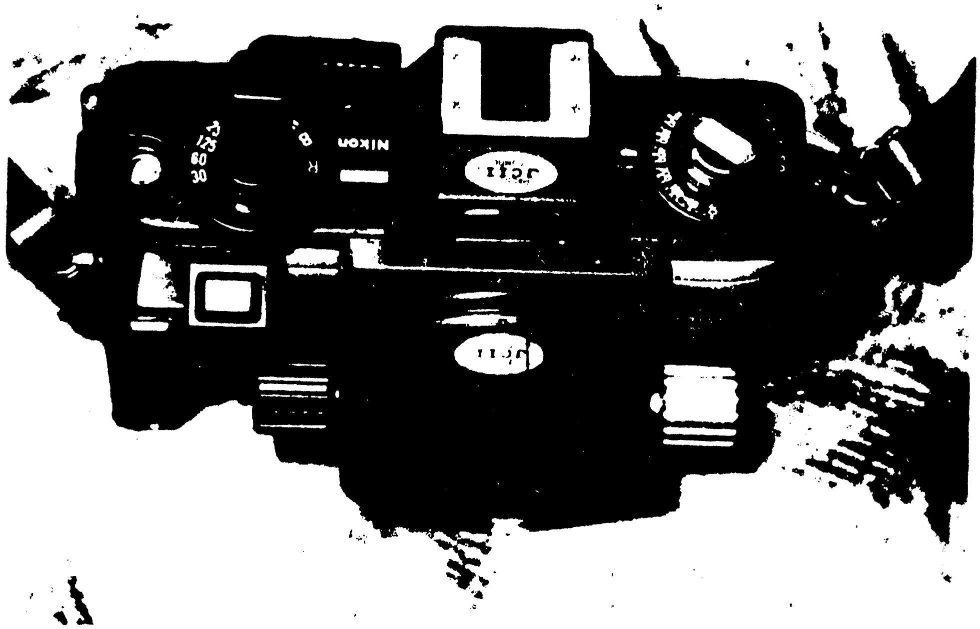
Nomenclature

11. Film rewind crank
12. Frame counter
13. Film advance lever
14. Shutter speed/mode selector dial
15. ASA/ISO film speed dial

A

B

D



16. Identify the proper sequence of steps to prepare a Nikonos camera for operation.

(1) Load film
(2) Mount lens
(3) Install batteries
(4) Check battery power

a. 3,2,1,4
b. 3,2,4,1
c. 3,4,2,1
d. 2,3,4,1

17. Your recon team is on a mission to obtain information on an enemy ammo supply point. You have reached a point where you cannot get any closer to the objective without running the risk of compromising your patrol. You're fairly inexperienced at photography but have a basic understanding of it. After you have set your f-stop, what is the best exposure mode for this photograph?

a. Manual setting
b. M-90
c. Automatic setting
d. Bulb

18. From the scrambled list of steps, select the proper sequence to unload the Nikonos camera.

(1) Lift up the film rewind knob and rotate it in the direction of the arrow to secure it.
(2) Open the camera back and remove the film.
(3) Continue rewinding the film until you feel resistance. Turn two or three more times.
(4) Set the shutter/speed mode selector dial to R.
(5) Close and lock camera back.
(6) Place film in an airtight covering or in the original container.

a. 4,1,6,5,3,2
b. 4,1,3,2,5,6
c. 4,1,3,2,6,5
d. 4,1,3,5,6,2

19. Identify the three types of photographic views required to provide satisfactory ground photography.

a. Narrow, distant, and marginal
b. Detail, closeup, and distant
c. Closeup, marginal, and exact location
d. Distant, medium, and closeup

20. You are on a reconnaissance mission to photograph a communication system. Upon reaching your objective, you realize your team cannot get closer to the objective due to the risk of being compromised. Your view of the objective is very distant. To get the best possible photograph you would

   a. move to an unobstructed view, focus at the center, and take one carefully exposed photograph.

   b. move to an unobstructed view, focus at infinity, and take several photos of the center portion.

   c. move to an unobstructed view, focus at infinity, and take several carefully exposed, overlapping views.

   d. move to an unobstructed view, focus at the ends of the object, and take two carefully exposed photographs.

21. What is the purpose for maintaining a photo log?

   a. Keeps track of the amount of film used, assists in the developing of the military sketch, and helps make photo annotations or overlays

   b. Allows the photographer to provide adequate and accurate data which the interpreter can later use to provide intelligence

   c. Keeps track of the amount of film used, assists in developing the panoramic sketch, and in completing the Photo Data Sheet

   d. Assists the photographer in processing data during the mission, locates the object for an air strike, and assists in completing the Photo Data Sheet.

Matching: For items 22 through 26, match the numbered information in column 1 with the correct labeled block on the incomplete Photo Data Sheet. After the corresponding item number on the answer sheet, blacken the appropriate circle.

Column 1

Photo Data Sheet information

22. Nicaragua
23. Located 300 meters SW of road intersection
24. Ammo locker located in ARS compound
25. Two separate ammo lockers painted green, 12'x4'x4', located on top of a cement slab, and do not appear secured to it. Both lockers are locked with a padlock.
26. Cape Code 1;50,000 sheet 56471 Series V734
Ed 3-DMATC

PHOTO DATA SHEET

Type of Camera ____________ Focal Length ________

Film size/ Type ______ a. Roll No ______ Exp No ______

Time ____________ Date ______________

Other Data ________________________

Camera Azimuth

Nation/Country	Provence/State	City/Town	Other
b.			

Coordinates	Map Reference
	f.

Name of Activity

d.

Reference Point

e.

Remarks

c.

(OVER IF REQUIRED)

Photographer: ______________________

Unit: ______________________

UNCLASSIFIED

Classification

27. Your team's mission is to conduct a hydrographic survey of the beach and photograph an enemy compound. Once finished, your team will move back to the beach for extraction. During the waterborne movement, a large wave hits your team and capsizes the rubber craft causing loss or damage to some of the equipment. Part of the gear lost is the team's only camera. Although your team does not have much time to complete the mission, your team leader is determined to finish both tasks. Instead of photographing the site, you will sketch it. Due to the time restraints and lack of equipment, which type of sketch would be appropriate to accomplish the mission?

   a. Panoramic
   b. Picture
   c. Data
   d. Military

28. Select the purposes for using a sketch sheet.

   a. The sketch sheet is a tool to help fill in information for the Photo Data Sheet. It provides enough space for 200 mils of data.

   b. The sketch sheet is a tool to help in the construction of an accurate sketch. It provides enough space for 450 mils of data.

   c. The sketch sheet measures deflection in mils from a reference point to target features. It provides enough space for 100 mils of data.

   d. The sketch sheet is a tool which helps pinpoint targets for air strikes. It provides enough space for 450 mils of data.

29. Identify the two factors that determine the scale of a military sketch.

   a. Size of the area to be sketched and size of available sketching material
   b. Size of available sketching material and distance from the specified object
   c. The type of horizon in view and size of sketching material available
   d. Size of the area to be sketched and the type of horizon in view

30. Identify the proper sequence of steps for placing information on a panoramic sketch.

    (1) Draw major target features.
    (2) Sketch skyline.
    (3) Draw terrain features.
    (4) Add vegetation.
    (5) Select a reference point and line.
    (6) Study the terrain.
    (7) Fill in marginal data.

a. 6,5,7,2,3,5,1
b. 6,5,7,4,1,3,2
c. 6,5,7,2,3,1,4
d. 6,5,7,3,2,4,1

31. Identify the two factors that play an important role in positioning communication equipment.

a. Type of equipment used and experience of the operator
b. Ability to camouflage your equipment and experience of the operator
c. Size of the operator and experience of the operator
d. Optimum communication and the ability to camouflage your equipment

32. After establishing the objective rally point, communication to HQ has become very difficult to obtain. Select the appropriate course of action to enhance your radio transmissions.

a. (1) Avoid any electrical power sources.
   (2) Avoid locating your antenna near metal objects.
   (3) Point the radio antenna in the direction of transmission.
   (4) Position the radio in low concealed areas.

b. (1) Ensure all connecting parts have had PM.
   (2) Position you antenna as high as you can.
   (3) Keep your radio as far back as possible from obstacles.
   (4) Avoid electrical power sources and metal objects.

c. (1) Position the radio in low concealed areas.
   (2) Place the radio near natural lines of drift.
   (3) Position the radio as high as you can.
   (4) Keep the radio as far back as possible from obstacles.

d. (1) Ensure all connecting parts have had PM.
   (2) Locate your antenna near metal objects.
   (3) Point the radio antenna in the direction of high ground.
   (4) Position the radio in high concealed areas.

33. Select the length of time the AN/PRC-104 must warm up prior to using.

a. 10 seconds
b. 30 seconds
c. 1 min.
d. 2 min.

34. The AN/PRC-104, when set up to operate in a fixed location, has the capabilities to use three different antennas besides the 10ft whip. Select the correct three antennas the radio can use.

a. Double tape antenna, AS-2258, half-wave dipole
b. AS-2259, half-wave dipole, triple wave slant
c. Quarter wave slant, AS-2259, half-wave dipole
d. AS-2359, half wave dipole, quarter wave slant

35. Identify the correct set up procedures for the AN/PRC-104.

(1) Attach the power source.
(2) Remove the receiver transmitter-amplifier coupler combination from the carrying case.
(3) Ensure the volume off/max switch is in the off position.
(4) Open the accessory/carrying case.
(5) Unfasten the case latches and remove the cover.
(6) Set the side band select switch to USB and set the volume to desired level.
(7) Set the frequency to 2.221.2 kHz.
(8) Attach the antenna shock mount with the whip antenna.
(9) Connect the handset to the audio connector.
(10) Set the frequencies.

a. 4,5,2,3,1,8,9,10,7,6
b. 4,5,2,3,1,8,9,7,6,10
c. 4,5,2,3,1,6,7,8,9,10
d. 4,5,2,3,10,6,7,8,1,9

36. The AN/PRC-113 is a ___ band, portable radio set.

a. two
b. three
c. four
d. five

37. The range of the AN/PRC-113 is

a. 23.2 miles for surface to ground.
b. line of site for ground-to-air communications.
c. 15 miles for ground-to-ground communications.
d. 20 miles for air-to-air.

38. Identify the correct set-up procedures for the AN/PRC-113 radio.

(1) Adjust the dim control.
(2) Connect the handset.
(3) Connect the antenna.
(4) Install the batteries.
(5) Switch on the On/Vol control knob.
(6) Select mode of operation.
(7) Load preset channels.
(8) Transmit.
(9) Select manual frequency.
(10) Observe display decimal point.

a. 4,3,2,5,1,10,9,7,6,8
b. 4,3,2,5,1,10,6,7,8,9
c. 4,3,2,1,5,10,9,6,7,8
d. 4,3,2,1,5,6,7,8,9,10

39. The AN/PRC-68 is designed for short ranges from _______ yards to _______ mile(s).

a. 200, 1/2
b. 250, 1
c. 300, 1.
d. 400, 5

40. The number of channels you can preset on the AN/PRC-68 is

a. 10.
b. 11.
c. 12.
d. 15.

41. Identify the three main components of the AN/PRC-68.

a. Upper band box, receiver-transmitter, and antenna
b. Receiver-transmitter, battery box, and antenna
c. Amplifier coupler, battery box and whip antenna
d. Battery box, high/low band box, and whip antenna

42. The range of the AN/PRC-119 when switched on HI (high) is __________kilometers.

a. 2 to 3
b. 4 to 8
c. 8 to 9
d. 9 to 10

43. How many channels can be preset in the SC (single channel) mode?

a. 7
b. 8
c. 9
d. 10

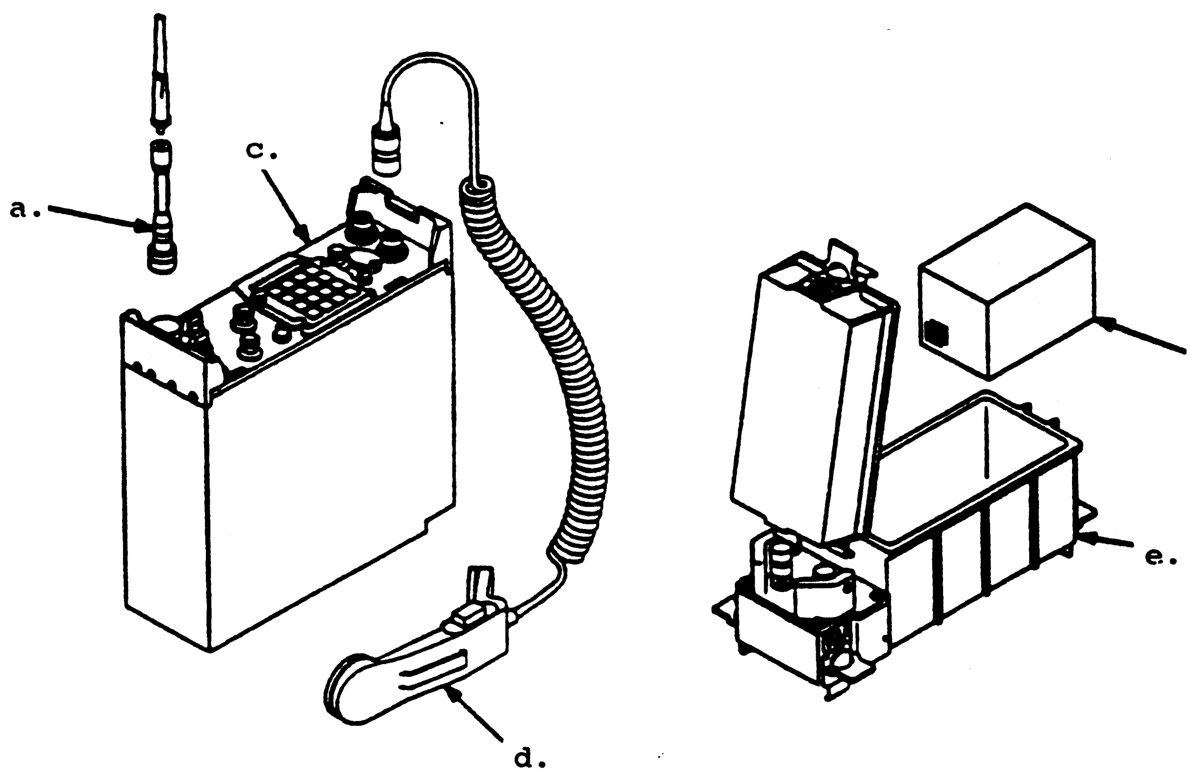
44. The battery life of the AN/PRC-119 is_______hours.

a. 13 to 15
b. 15 to 17
c. 17 to 19
d. 18 to 20

Matching: For items 45 through 49, match the name of the component in column 1 to the corresponding illustration below. After the corresponding item number on the answer sheet, blacken the appropriate circle.

Column 1

45. Handset
46. Battery
47. Manpack-antenna
48. Receiver-transmitter
49. Battery box



Matching: For items 50 through 52, match the antenna in column 1 to its directional characteristics in column 2. After the corresponding item number on the answer sheet, blacken the appropriate circle.

Column 1	Column 2
Antennas	Characteristic
50. Uni-directional	a. Any two opposite directions
51. Bi-directional	b. All directions
52. Omni-directional	c. Any one directions

53. Identify the correct formula you would use to obtain the length of a quarter wavelength antenna in feet using the operating frequency of 44.8.

    a. Divide 254 by the radio call sign.
    b. Divide 234 by the operating frequency.
    c. Divide 264 by the operating frequency.
    d. Divide 468 by the operating frequency.

54. Identify the seven field expedient insulators.

    a. Metal, boots, books, trash cans, plastic bag, nylon rope, and rubber
    b. Plastic spoon, button, bottle neck, boots, metal pipes, copper poles, and rubber
    c. Plastic spoon, button, bottle neck, plastic bag, rubber or cloth strip, nylon rope, and cloth rope
    d. Metal pipes, copper, trash cans, plastic bag, nylon rope, plastic spoon, and books

55. When drawing a panoramic sketch, select the scale that would be used.

    a. Objects are drawn in proper proportion to each other.
    b. Ten by ten graph paper provides the size of scale needed.
    c. The size of available sketching material determines scale.
    d. Scale will be determined after the sketch is turned in.

Matching: For items 56 through 60, correctly match the antenna name in column 1 with the illustrations below. After the corresponding item number on the answer sheet, blacken the appropriate circle.

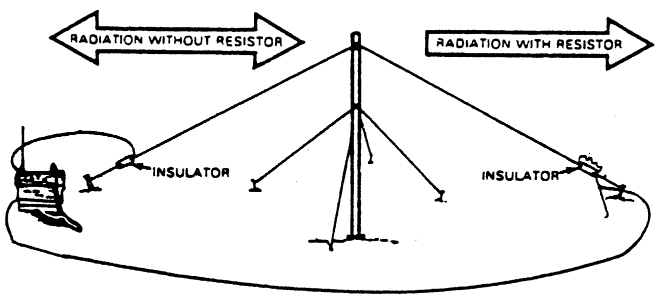
Column 1

Antenna

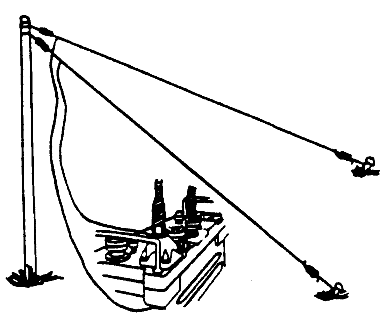
56. Sloping wire
57. Vertical wire
58. Half-rhombic
59. Half-wave center fed
60. Sloping "V"

Illustrations

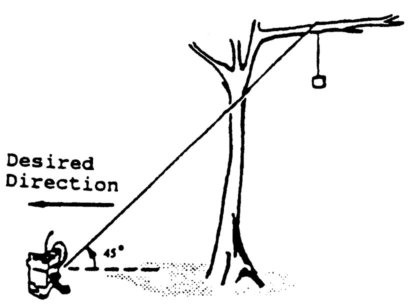
a.



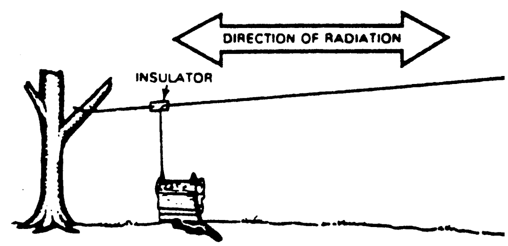
b.



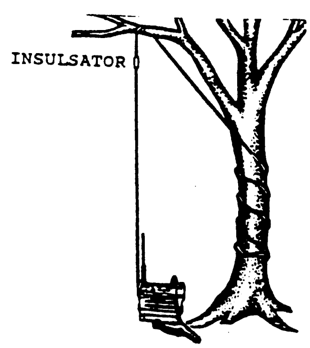
c.



d.



e.



61. The field expedient antenna that is fed with a current of opposite polarity and when its legs are lengthened increases the effect of gain and directivity is the _______ antenna.

a. sloping "V"
b. sloping wire
c. vertical wire
d. half-rhombic

62. Identify the five possible missions an ITG team can perform.

a. Give assistance to helos, provide ITG, call for naval gunfire, prepare the LZ for ITG operations, and provide data on the security of the area

b. Conduct terrain recon, provide pre-H hour reports, provide Marines for battalion blocking positions, assist line units in the establishment of defensive positions, and call for naval gunfire

c. Provide landing assistance and limited traffic control for helos, provide ITG, provide pre-H hour reports, prepare the LZ for ITG operations, and conduct terrain recon

d. Provide landing assistance and limited traffic control for helos, call for naval gunfire, assist line unit in the establishment of defensive positions, provide pre-H hour reports, and give assistance to helos

63. Identify the different methods of insertions for an ITG team.

a. Infiltration, landing craft, helicopter, motor vehicle, parachute, and rubber boat
b. Parachute, helicopter, landing craft, SPIE, rubber boat, and swim
c. Helicopter, landing craft, parachute, glider, rubber boat, and helicast
d. SPIE, glider, helicopter, infiltration, rubber boat, and parachute

Matching: For items 64 through 68, match the ITG terminology in column 1 to its definition in column 2. Selections in column 2 may not be used more than once. After the corresponding item number on the answer sheet, blacken the appropriate circle.

Column 1 Terminology	Column 2 Definition
64. Terminal guidance	a. Phase of terminal guidance, normally pre-H hour, during which assistance is given to the pilots of leading helo waves
65. Initial terminal guidance	b. One or more helos grouped under a single leader and scheduled to land in the same LZ at approximately the same time
66. HLZ	c. Task organized unit formed and equipped for loading and unloading helos; Provides LZ security, and emplaces and operates navigational aids
67. HST	d. Any electronic, mechanical, visual, or other assistance given to helo pilots to facilitate arrival to an LZ
68. Helicopter wave	e. A specific ground area used for landing a helo force

69. Identify the organization of an ITG team.

a. Landing zone control team, landing site team, and the security team
b. Traffic control station, blocking force, and assault element
c. Security team, traffic control station, and initial point party
d. Landing zone control center, initial point party, and assault element

70. Identify the five priorities of work when preparing an HLZ.

a. Mark assembly sites, erect direction nets, prepare routes to and from HLZ, establish security, and prepare exits
b. Establish security, prepare routes to and from HLZ, mark registration points, mark assembly sites, and erect direction nets
c. Establish security, erect direction nets, erect navigational aids, prepare landing sites, and mark troop assembly sites
d. Mark assembly sites, prepare routes to and from HLZ, establish security, position Marines, and erect direction nets

71. Your team's mission is to provide ITG for aircraft. After jumping into the DZ and establishing security, you learn that the aviation unit has specified that the aircraft will be initiating the approach from 500 feet above ground level. Select the appropriate method for marking the HLZ.

a. Landing "T"
b. Lighted "Y"
c. Standard "Y"
d. Inverted "Y"

Matching: For items 72 through 76, match the LSE name in column 1 with the appropriate illustration. After the corresponding item number on the answer sheet, blacken the appropriate circle.

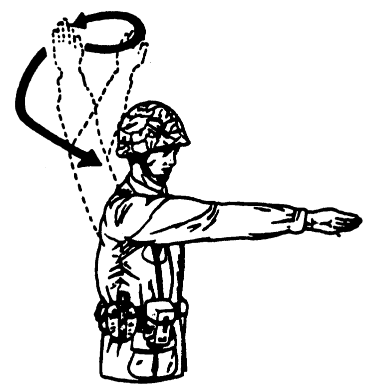
Column 1

LSE signals

72. Land
73. Take off
74. Hover
75. Prepare for guidance
76. Wave off

a.

d.



b.

e.

c.

77. You are in the process of filling out a landing site report. The landing site is moderated with sandy surface, which is dry enough to be blown around by the helicopter. Using the HELLSREP format below and the information provided, select the appropriate code for the surface of the LS.

a. G2 AG
b. G2 AM
c. G4 LK
d. G2 AY

GOLF <u>LS Surface</u>. Should be reported in three parts. First, it should be classified as:

	Number Code
<u>Hard</u>: Can support the helicopter and be used by 2-wheel drive vehicles or 4-wheel drive vehicles and trailers, unless heavy and continuous use is intended.	1
<u>Moderate</u>: Can be used by 3- or 4- ton vehicles which should be able to start from rest using 4 wheel drive.	2
<u>Soft</u>: 4-wheel drive vehicles cannot start from rest, but might cross if already on the move.	3

The surface should then be described as:

	Letter Code
Sand	A
Grass	B
Scrub	C
Snow	D
Ice	E
Marsh	F
Dust	G
Any other surface	H

When ground is covered by snow, additionally report subsurface. It should be reported whether the surface will recirculate, reporting Y for yes and N for no. Recirculation is the effect of the downwash of the helicopter which is liable to pick up sand, dust, or snow, and blow through the rotors thereby severely reducing the pilot's visibility. This will have an effect on the frequency at which helicopter can land.

<u>NOTE</u>: Wind speed at ground level at the periphery of a helicopter's rotors can be in excess of 60 knot; e.g., hard surface of snow covered grass, the snow is liable to recirculate - G1 BD Y.

HELLSREP format.

78. Identify the four types of intelligence information collected by reconnaissance teams for the preassault mission.

    a. Hydrographic information, beach description, inland terrain description, and enemy defenses
    b. Enemy situation, friendly situation, breaker size, and possible course of action of the enemy
    c. Beach description, inland terrain description, enemy situation, and size of enemy force
    d. Hydrographic information, beach description, inland terrain description, and friendly forces

79. Identify the purpose of a reconnaissance area of operation.

    a. Established to identify reconnaissance primary routes
    b. Established to identify reconnaissance operational areas
    c. Established for designating targets of opportunity for the company
    d. Established to identify primary routes for amphibious vehicles

80. Identify the three elements of a beach survey report.

    a. Observed enemy situation, beginning, and end
    b. Heading, friendly situation, and beach description
    c. Heading, beach description, and observed enemy situation
    d. Observed enemy situation, heading, and ending

81. Identify the three sections of a hydrographic survey.

    a. Observed enemy situation, time of observation, and equipment
    b. Heading, hydrographic description, and mission of the team
    c. Heading, hydrographic description, and observed enemy situation
    d. Observed enemy situation, hydrographic description, and number of men in the team

Matching: For items 82 through 86, match the phonetic code of the surf report in column 1 to the information that belongs under the code in column 2. After the corresponding item number on the answer sheet, blacken the appropriate circle.

Column 1 Format Code	Column 2 Surf Report Information
82. Echo	a. Average time between breakers 9 1/2 sec.
83. Delta	b. Average height was 1 1/2 meters.
84. Alpha	c. The largest breaker was 2 meters high.
85. Bravo	d. The surf observation was completed at 071930Z.
86. Charlie	e. Units of measure used are meters, knots, and degrees.

Matching: For items 87 through 90, match the trafficability of beaches from the CONBEREP in column 1 to its letter code in column 2. After the corresponding item number on the answer sheet, blacken the appropriate circle.

Column 1 Trafficability	Column 2 Letter Code
87. Very soft	a. Z
88. Soft	b. Y
89. Firm	c. X
90. Moderate	d. W

91. Using the DELTREP format below and the information provided, select the correct codes. You are on a recon mission to report the trafficability of a river. You determined that the grid for the landing point is 105643 and the type of craft which can use the point is a shallow boat with outboard motors. The overall trafficability of the landing point can be used by 3-or 4-ton vehicles, although you recommend that beach matting on the roadway be used.

a. G 105643 1Z

b. G 105643 3G

c. G 105643 3X

d. F 105643 1X

GOLF <u>Beaching landing points and their exits</u>. These are described in the following order:

<u>First</u>. Grid reference.

<u>Second</u>. Type of craft which can use the land point indicated by the following number code:

Craft	Number Code
Landing craft medium/utility	1
Landing craft personnel	2
Shallow boats with outboard motors	3

<u>Third</u>. Overall trafficability of the beaching point and exits shown by the following letter code:

Trafficability	Letter Code
<u>Firm</u>: This can be used by 2-wheel drive vehicles or 4-wheel drive vehicles and trailers unless heavy and continuous use is intended.	W
<u>Moderate</u>: This can be used by military 3-or-4 ton vehicles which should be able to start from rest using 4-wheel drive. It is recommended that beach matting roadway be used.	X
<u>Soft</u>: Four wheel drive vehicles cannot start from rest but might be able to cross a soft patch if already on the move. It is recommended that beach matting/roadway be used.	Y
<u>Very soft</u>: This is impassable to wheeled vehicles may experience difficulty. Beach matting/roadway is required.	Z

DELTREP report format.

92. Using the route report format below and the information provided, select the correct codes. You are on a route recon mission and are planning to encode the following information. The units of measure are in feet; the portion of the route that was reconnoitered is from grid 108654 to 109653. The route is a limited all-weather road with a traveled way averaging 35 feet. There is an abatis made of heavy wood logs and concrete. This constriction is located at grid 108651. The abatis is 6 feet high and 5 feet wide. Bypass is possible after engineer improvement.

a. A.3, B. 108654-109653, C. Y, E. 35, F. Abatis 108651/A6, B 5ft, Q.
b. A.1, B. 108654-109653, C.X, E. 35, F. Abatis, 108654/A21, B5Q
c. A.3, B. 108654-109653, C. Y,E. 35, F Abatis 108651/A/6, B 5 R 63
d. A.3, B. 108654-109653, C.Z E. 30, F. Abatis 108651/A 5 B 6Q.

ALPHA	Units of measure.
BRAVO	Location. Location of start and finish of that part of the route actually reconnoitered.
CHARLIE	Type. The type of route is indicated by the following letter code: Letter Code All weather route — X Limited all weather route — Y Fair weather route — Z
DELTA	Military Classification. This assesment will only be made by qualified personnel. As a guide: Class 50: Average traffic routes Class 80: Heavy traffic routes Class 120: Very heavy traffic routes

Route report format.

ECHO	Width. The average width of travelled way followed by the average width of grading is reported. The "travelled way" is the hard surface of the road; the "width of grading" is the width of the travelled way plus the width of the hard shoulders.
FOXTROT	Route Considerations. These are listed individually and described in the following order: First: Nature of constriction. Second: Location of constriction. Third: Type of constriction shown as a letter in the following code:

	Letter Code
Height of constriction	A
Width of constriction	B
Radi us of curve constriction	C
Gradient	D

Fourth: Demensions of constriction using length/height unit of measure given in ALPHA.

Fifth: Bypass postential at constriction using the following letter code:

	Letter Code
Bypass easy. Local detour possible without engineer effort.	P
Bypass difficult. Bypass possible after engineer improvement.	Q
Bypass impossible.	S

Route report format--cont'd.

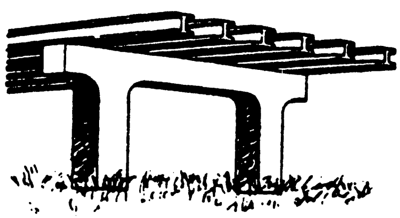
Matching: For items 93 through 97, match the bridge span name in column 1 to its appropriate illustration below. After the corresponding item number on the answer sheet, blacken the appropriate circle.

Column 1

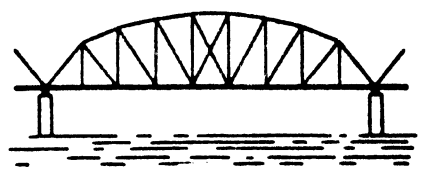
Bridge Span Name

93. Girder
94. Truss
95. Arch (open spandrel)
96. Arch (closed spandrel)
97. Beam

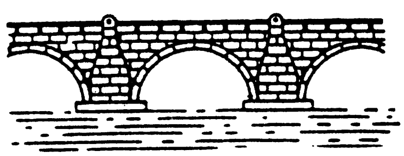
a.



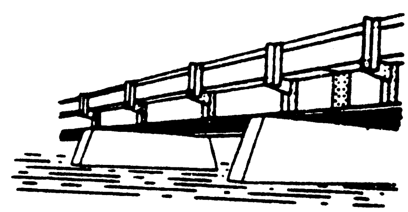
d.



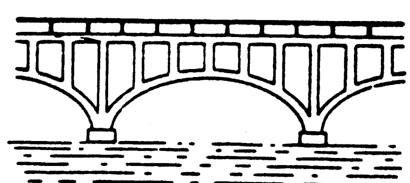
b.



e.



c.



98. **Using the bridge report format below and the information provided, select the correct codes. You are on a bridge recon mission and are planning to encode the following information. The bridge that you are gathering information on has five arch types (open spandrel) made of reinforced concrete. The spans are equally divided at five meters apart, and are capable of supporting light vehicles.**

a. **E.5 AK6/F.1-5,5A**
b. **E.5 AK6/F.2-5,5A**
c. **E.5 AK6/B.1-5,7A**
d. **E.5 AK6/F.4-1,5C**

ECHO Spans

First: The number, material, and type of span construction will be shown for each span by number and letter symbols.

Second: Spans will be listed in seqence starting from the west. If a bridge is running close to north/south, the spans will be listed from the north and the letter N inserted preceeding the numbers and letters.

Third: Material of span construction will be shown in the following letter code:

	Letter Code
Steel or other material	A
Concrete	K
Reinforced concrete	AK
Prestressed concrete	KK
Stone or brick	P
Wood	H
Other types	O

Fourth: Type of span construction will be shown for each span in the following numerical code:

	Number Code
Truss	1
Girders	2
Beams	3
Slab	4
Arch (closed spandrel)	5
Arch (open spandrel)	6
Suspension	7
Floating	8
Swing	9
Bascule	10
Vertical lift	11
Others	12

Bridge report format.

FOXTROT	<u>Length and condition of spans</u>. List and number lengths of individual spans in order reported in ECHO above. If any spans are damaged, classify them in the following letter code.	
		<u>Letter Code</u>
	May be significantly damaged, but probably capable of supporting light vehicles.	A
	Impassable to traffic, but span not totally destroyed.	B
	Span destroyed.	C

Bridge report format--cont'd.

99. Using the ford reconnaissance report below and the information provided, select the correct codes.
You are on a ford recon mission and are planning to encode the following information. The type of ford your team is gathering information on is for troops and autos. The width of the river is 25 ft and the depth is 1 ft. The VHL is 1.5 meters a second. The composition of the stream bottom is sandy with mud deposits.

a. C. AS, D. 25ft/D 1ft/VHL 1.5 meters per sec, E. S/M
b. C. AP, D. 25ft/D 1ft/VHL 1.5 meters per sec, E. S/C
c. C. AP, D. W ft/D 25ft/VHL 1.5 meters per sec, E. S/M
d. C. AP, D. W 25ft/D 1ft/VHL 1.5 meters per sec, E. S/M

Type	Letter Code
(a) Auto	A
(b) Pedestrian or animal	P
(c) Deep water	D
(d) Swimming vehicles	S

DELTA. Record here the characteristics of the crossing. This would include the width and depth of the crossing and the velocity of the stream at the present water level, and also at low, mean (average), and high water level. A standard unit of measurement is used to record the stream's velocity, while the following letter code is used to record and send remaining information.

Characteristic	Letter Code
(a) Width	W
(b) Depth	D
(c) Velocity (present level)	VPL
(d) Velocity (low level)	VLL
(e) Velocity (mean level)	VML
(f) Velocity (high level)	VHL

(5) ECHO. Indicate here the composition of the stream bottom using the following code letters.

Composition	Letter Code
(a) Mud	M
(b) Clay	C
(c) Sand	S
(d) Ground	G
(e) Rock	R
(f) Artificial paving	P

Ford report format.

For items 100 through 105, using the ground observer's report below, identify the correct blocks for the specified information in each of the questions.

100. The DTG would be placed in block number

a. 1. c. 5.
b. 2. d. 6.

101. The length of time your team will remain in the observation position will be placed in block numbers

a. 1 and 2. c. 5 and 6.
b. 2 and 3. d. 8 and 9.

102. Fourteen enemy troops moving south on the eastern side of the river would be placed in block number

a. 4. c. 6.
b. 5. d. 7.

103. The direction to the enemy is 360 degrees. This information is placed in block number

a. 1. c. 3.
b. 2. d. 4.

GROUND OBSERVERS REPORT

OP. NO. LOCATION SHEET NO. 1 of 1

UNIT FROM 1. TO 2.

IN CHARGE OF OP

MAP REF.

ITEM NO	TIME DATE	LOCATION			ACTIVITY	REPORTED TO WHOM? WHEN?	OBSERVER'S NAME
	5.	AZIMUTH	RANGE	REF. PTS.	4.		
		3.		6.		7.	

Ground observer's report

104. The river near your position was designated to be used as a reference point. In what block is this information placed?

a. 3 c. 5
b. 4 d. 6

105. The information you recorded on the observer's report was sent to Savoy 6 at 1430. This information is placed in block number

a. 4. c. 6.
b. 5. d. 7.

106. Identify the factors that determine the method of waterway reconnaissance.

a. The amount of time available, extent and characteristics of the waterway, the number of troops, and air support available
b. The amount of time available, the extent and characteristics of the waterway, the amount of detail required, and the mode of transportation used
c. The number of troops and air support available, the number of rubber crafts needed, and the extent and characteristic of the waterway
d. The time of day, the amount of rubber crafts needed, the extent and characteristics of the waterway, the number of troops needed

107. Identify the maximum number of hours observation posts are occupied.

a. 24 c. 56
b. 48 d. 65

108. Identify the predominant factors considered when selecting an inland landing area.

a. Friendly situation, transport type, and enemy disposition
b. Presence and nature of natural and manmade obstacles and possible defense of the area
c. Presence and nature of natural and manmade obstacles and the enemy disposition
d. Friendly situation, transport type, and enemy disposition

109. Identify the four requirements for selecting a landing area.

   a. Suitable for defending for long periods of time, allows the undetected approach and retirement of the transporting vehicle once the team is inserted, has sufficient stream water, and provides cover from indirect fire

   b. Allows the undetected approach and retirement of the transporting vehicle once the team is inserted, can be defended for long periods of time, has good withdraw avenues, and provides cover from indirect fire

   c. Allows the undetected approach and retirement of the transporting vehicle once the team is inserted, recognizable from the transport, large enough for minor error in predicted drift of parachutes, swimmers or boat teams, and far enough away from the initial orientation point to allow reasonable errors

   d. Allows the undetected landing of the transporting vehicle once the team is inserted, large enough for minor errors in predicted drift of parachutes, swimmers or boat teams, has good withdrawal routes, and has sufficient stream water

110. Inland withdrawal times are based on predicted winds, visibility, and the availability of

   a. signalling equipment.
   b. a recovery vehicle.
   c. ample rations.
   d. a replacement unit.

111. Select the time when coastal withdrawals should be performed.

   a. Dusk and prior to dawn
   b. Dusk and darkness
   c. Dawn and daylight
   d. Daylight and dusk

112. Identify the main advantage of performing first light landings in helicopters.

   a. The pilots are able to follow the roads and dirt trails on the ground.
   b. The pilots are able to conserve fuel due to the amount of moisture in the air.
   c. The enemy cannot observe the aircraft or its landing point from a great distance.
   d. The patrol is more likely to elude the enemy if contact is made.

For items 113 through 117, using the blank landing zone extract brief below, identify the correct numbered lines for the specified information in each of the questions.

1. SITUATION	____________
2. ZONE POSITION	____________
3. ZONE DESCRIPTION	____________ ____________ ____________ ____________
4. ENEMY POSITIONS	____________ ____________
5. WHEN LAST FIRE RECEIVED	____________
6. LOCATION, DIRECTION, DISTANCE, TYPE OF FIRE RECEIVED	____________
7. SUPPORTING ARMS IN PROGRESS.	____________ ____________
8. APPROACH DIRECTION	____________
9. DEPARTURE DIRECTION	____________

Blank extract zone brief.

113. The HLZ grid is placed on line number

a. 1. c. 4.
b. 2. d. 5.

114. The HLZ is flat. It has one to two foot high brush, it is 300 meters wide, and 400 meters long and is at sea level. This information is placed on line

a. 1. c. 3.
b. 2. d. 6.

115. The last known enemy position is four kilometers to the north. This information is placed on line.

a. 1 c. 4
b. 2 d. 8

116. You recommend that the approach direction be from the northeast. This information is placed on line.

a. 5 c. 7
b. 6 d. 8

117. Panels will be used to mark the HLZ. On what line number is this information placed.

a. 2 c. 6
b. 3 d. 7

118. Identify the main disadvantage of performing last light landings in helicopters.

a. The helicopter can be observed from a long distance
b. The patrol does not have the benefit of approaching darkness
c. Fuel consumption is increased by the amount of dry air
d. No daylight will be available to facilitate emergency extraction or provide reinforcements

119. Identify the troop capacity for the Avon 450 with full tactical load.

a. 2 Marines c. 6 Marines
b. 4 Marines d. 8 Marines

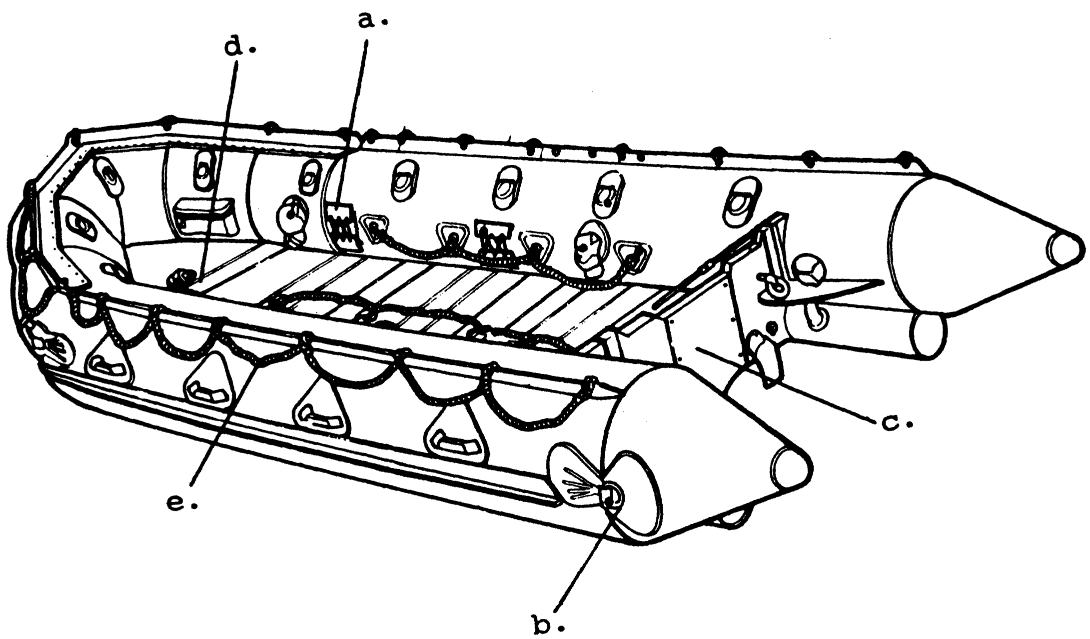
120. Identify the recommended maximum engine horsepower for the Zodiac F-470 w/aluminum deck.

a. 65 HP c. 75 HP
b. 70 HP d. 80 HP

Matching: For items 121 through 125, match the nomenclature in column 1 to the correct lettered part in the illustration below. After the corresponding item number on the answer sheet, blacken the appropriate circle.

Nomenclature

121. Sheath
122. D-rings
123. Transom
124. Thrust board
125. Lifeline



The Zodiac F-470

126. Identify the troop capacity for the Zodiac F-470 with full tactical load.

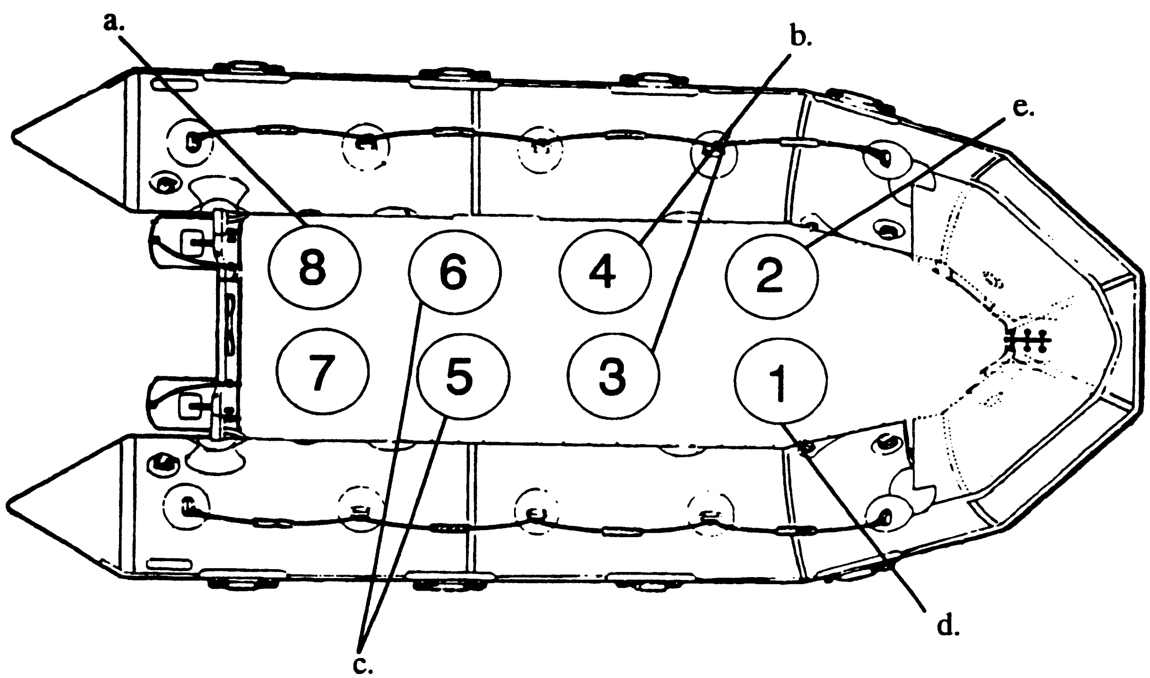
a. 9 Marines
b. 10 Marines
c. 11 Marines
d. 12 Marines

127. Identify the recommended maximum engine horsepower for the Avon 450.

a. 25 HP
b. 35 HP
c. 40 HP
d. 50 HP

Matching: For items 128 through 132, match the numbered positions on the diagram to the appropriate job. After the corresponding item number on the answer sheet, blacken the appropriate circle.

128. This man is the navigator. He assists the coxswain in keeping the boat perpendicular to the breakline when launching the boat.
129. The coxswain is responsible for the performance of the crew. He issues all commands to the crew.
130. The two men that are responsible for lashing and unloading equipment in the boat and are used as scout swimmers during tactical boat landings.
131. The two men that assist in lashing and unloading equipment, they also assist the coxswain in maneuvering in swift currents.
132. This man handles the towline and quick release line during towing operations.



Rubber craft diagram.

Matching: For items 133 through 137, match the boat commands in column 1 to their definitions in column 2. After the corresponding item number on the answer sheet, blacken the appropriate circle.

Column 1	Column 2
Boat commands	Command definitions
133. "BACK WATER"	a. Crew members lift the boat to about knee height by the carrying handles.
134. "HOLD WATER"	b. Paddlers paddle backwards
135. "HIGH CARRY"	c. Paddlers hold their paddles motionless in the water with the blade perpendicular to the direction of motion.
136. "LOW CARRY"	d. Paddlers stroke in unison.
137. "GIVE WAY TOGETHER"	e. Crew members lift the boat to head height.

138. Identify the two methods used for debarkation while aboard a submarine.

    a. Submerged and surfaced
    b. Ladder and rubber craft
    c. Submerged and rear hatch
    d. Surfaced and helicast

139. Identify the five methods used for vectoring/homing a submarine for withdrawal.

    a. Hand and arm signals, voice, percussion grenades, infrared light, and underwater sound
    b. Visible light, radar, underwater sound, clapping of stones, and registration points
    c. Radar, infrared light, visible light, percussion grenades, and underwater sound
    d. Voice, hand and arm signals, infrared light, radar, and white star pop ups

LAST PAGE OF THE REVIEW LESSON

Review Lesson Solutions

		Reference
1.	a.	1101
2.	b.	1101
3.	a.	1102
4.	d.	1102
5.	c.	1202
6.	a.	1201
7.	b.	2101
8.	c.	2101
9.	a	2101
10.	d.	2101
11.	c.	2102
12.	b.	2102
13	a	2102
14.	d.	2102
15.	e.	2102
16	a.	2103
17	c	2104
18.	c.	2105
19.	d.	2202
20.	c.	2204
21.	b.	2205
22.	b.	2206
23.	e.	2206
24.	d .	2206
25.	c .	2206
26.	f .	2206
27.	a.	2302
28.	b.	2301
29	a.	2303
30	c.	2302
31	d.	3101
32	b.	3101
33	c.	3201
34	c.	3201
35.	b.	3201
36.	a.	3301
37.	b.	3301
38.	a.	3301
39.	c.	3401
40.	a.	3401
41.	b.	3401
42.	b.	3401

		Reference
43.	b.	3501
44.	d.	3501
45.	d.	3502
46.	b.	3502
47.	a.	3502
48.	c.	3502
49.	e.	3502
50.	c.	3601
51.	a.	3601
52.	b.	3601
53.	b.	3602
54.	c.	3603
55.	a.	2302
56.	c.	3604
57.	e.	3604
58.	a	3604
59.	d.	3604
60.	b.	3604
61.	a.	3604
62.	c.	4101
63.	a.	4101
64.	d.	4102
65.	a.	4102
66.	e.	4102
67.	c.	4102
68.	b.	4102
69.	a.	4201
70.	c.	4202
71.	a.	4202
72.	e.	4203
73.	d.	4203
74.	a.	4203
75.	c.	4203
76.	b.	4203
77.	d.	4301
78.	a.	5101
79.	b.	5102
80.	c.	5103
81.	c.	5201
82.	a.	5202
83.	c.	5202

		Reference
84.	e.	5202
85.	d.	5202
86.	b.	5202
87.	a.	5203
88.	b.	5203
89.	d.	5203
90.	c.	5203
91.	c.	5302
92.	a.	6101
93.	e.	6201
94.	d.	6201
95.	c.	6201
96.	b.	6201
97.	a.	6201
98.	a.	6202
99.	d.	6301
100.	c.	6401
101.	a.	6401
102.	a.	6401
103.	c.	6401
104.	d	6401
105.	d.	6401
106.	b.	5301
107.	a.	6401
108.	c.	7101
109.	c.	7101
110.	b.	7102
111.	a.	7201
112.	c.	7201
113.	b.	7202
114.	c.	7202
115.	c.	7202
116.	d.	7202
117.	b.	7202
118.	d.	7202
119.	d.	7301
120.	a.	7301
121.	a.	7301
122.	b.	7301
123.	c.	7301
124.	d.	7301

	Reference
125. e.	7301
126. b.	7301
127. c.	7301
128. d.	7302
129. a.	7302
130. b.	7302
131. c.	7302
132. e.	7302
133. b.	7303
134. c.	7303
135. e.	7303
136. a.	7303
137. d.	7303
138. a.	7402
139. c.	7403

BIBLIOGRAPHY

Source Materials

FMFM 2-2 Amphibious Reconnaissance

FMFM 6-7 Scouting and Patrolling for Infantry Units

Additional Reading/Reference

FMFM 6-8 Supporting Arms Observer, Spotter, and Controller

FMFRP 12-21 AARUGHA!

Landing Force Training Command, Pacific, Water Book (April 1989) and Ground Reconnaissance (March 1989)

Landing Force Training Command, Atlantic, Recon Skills (January 1988)

MCI Related Courses

03.35 Infantry Patrolling

03.81a Land Navigation

☆U.S. GOVERNMENT PRINTING OFFICE:2005-310-141/81228