CHAPTER 6

NAVAL ORGANIZATION

Organization is the element of administration which entails the orderly arrangement of materials and personnel by functions in order to attain the objective of the unit. Organization establishes the working relationship among unit personnel; establishes the flow of work; promotes teamwork; and identifies the responsibility, authority and accountability of individuals within the unit.

—Standard Organization and Regulations of the U.S. Navy,
OPNAVINST 3120.32C

The primary mission of the Navy is to support U.S. national interests. To do that, the Navy must be prepared to conduct prompt and sustained combat operations at sea. Each Navy unit must be prepared to engage in battle and support other units and forces in battle. Meeting the objectives of this mission requires organization. This chapter introduces you to naval organization, including the Department of Defense, the Department of the Navy, a typical unit organization, and the chain of command.

DEPARTMENT OF DEFENSE

Learning Objective: When you finish this chapter, you will be able to—

- Recognize the organization of the Department of Defense (DoD) to include the Department of the Navy (DoN) and the operating forces.

Originally, two executive departments managed the armed forces—the Department of War and the Department of the Navy. In 1947, the United States created the Department of Defense (DoD) as part of its security program by combining these two departments. The DoD consists of various agencies and three military departments—the Army, Navy, and Air Force. The DoD includes the Joint Chiefs of Staff, which consists of a chairman, the military heads of each department, and the Commandant of the Marine Corps. The DoD maintains and employs the armed forces to carry out the following missions:

1. To support and defend the Constitution of the United States against all enemies, foreign and domestic
2. To ensure, by timely and effective military action, the security of the United States, its possessions, and areas vital to its interests
3. To uphold and advance the national policies and interests of the United States
4. To safeguard the internal security of the United States

Figure 6-1 shows how the armed forces fit into the organization of the DoD to carry out these missions. The DoD is headed by the Secretary of Defense (SECDEF). The military departments that come under the DoD are the Department of the Army, the Department of the Air Force, and the Department of the Navy. Each department has a secretary as the head of department. By law, these secretaries (Army, Navy, Air Force, and SECDEF) are civilian appointees of the President. The Secretary of the Navy (SECNAV) heads the department of which you are a part.

DEPARTMENT OF THE NAVY

The mission of the Navy is to maintain, train, and equip combat-ready naval forces capable of winning wars, deterring aggression, and maintaining freedom of the seas. The Department of the Navy has two main objectives:

1. The first objective is to organize, train, equip, prepare, and maintain the readiness of Navy and Marine Corps forces to perform military missions. These forces carry out military missions as directed by the President through the Secretary of Defense, to the SECNAV, to the Navy Department.

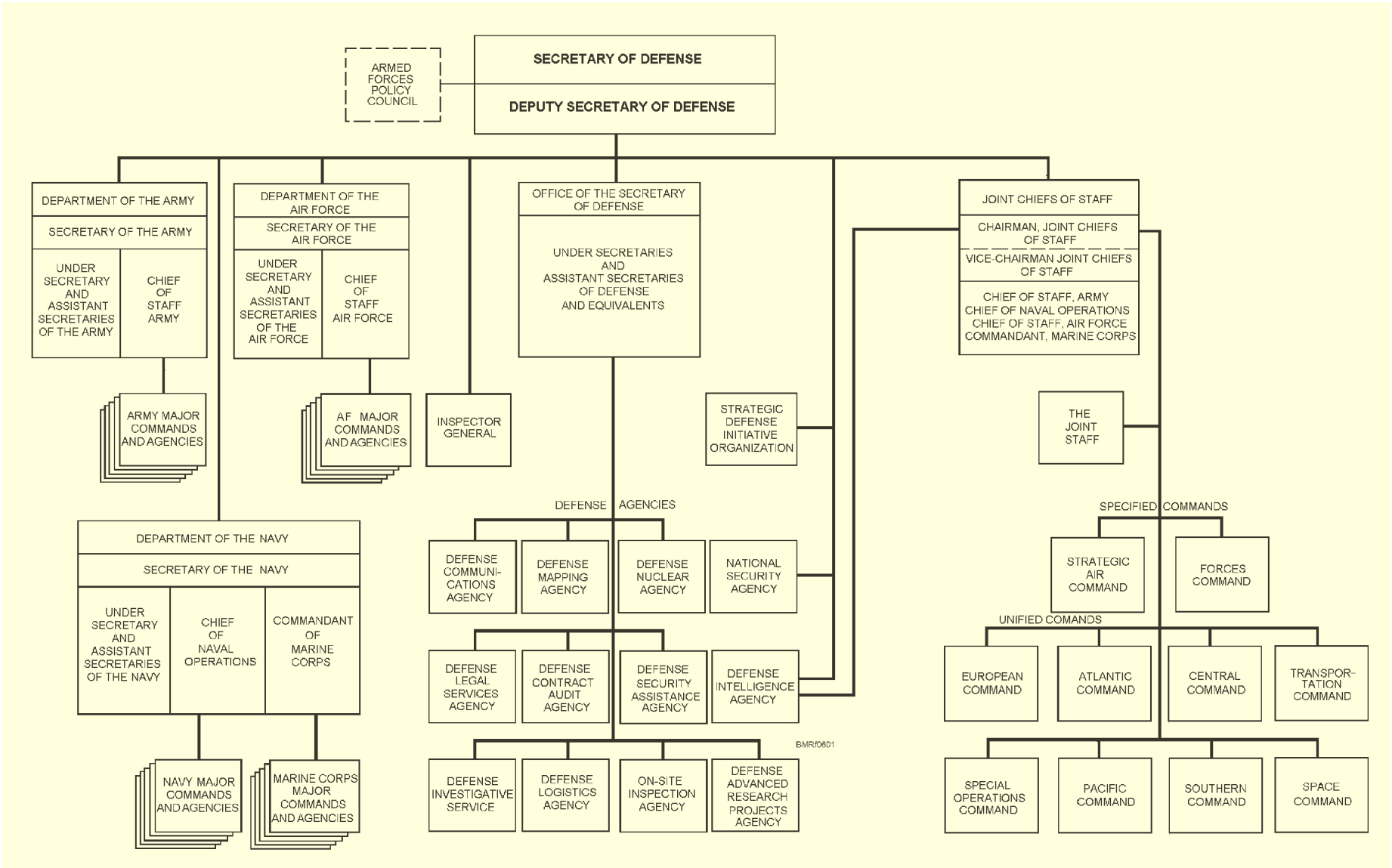

Figure 6-1.—Organizational chart of the Department of Defense.

2. The second objective is to support the Navy and Marine Corps forces as well as the forces of other military departments. The Department of the Navy supports these forces as directed by the Secretary of Defense.

Figure 6-2 shows the basic organization of the DoN. The SECNAV is responsible for, and has the authority under Title 10 of the United States Code, to conduct all the affairs of the Department of the Navy. The SECNAV has the following responsibilities:

- Conducts recruiting, organizing, supplying, equipping, training, and mobilizing, and demobilizing
- Oversees the construction, outfitting, and repair of naval ships, equipment and facilities
- Formulates and implements policies and programs that are consistent with the national security policies and objectives established by the President and the Secretary of Defense

The DoN consists of two uniformed Services—the United States Navy and the United States Marine Corps. You can find out more about these organizations by using the Internet. The Internet address is www.navy.mil. There, you can connect to a Navy organization's homepage.

Figure 6-3 shows you an overview of the organization of the DoN. The U.S. Navy was founded on 13 October 1775, and the Department of the Navy was established on 30 April 1798. The Department of the Navy has three principal components—

1. The Navy Department, consisting of executive offices mostly in Washington, D.C.
2. The operating forces, including the Marine Corps
3. The Shore Establishment

In this chapter, you will learn about the operating forces and shore commands. The reserve components are part of DoN. In times of war, the U.S. Coast Guard is also a part of the DoN; during peacetime, the U.S. Coast Guard is a part of the Department of Transportation.

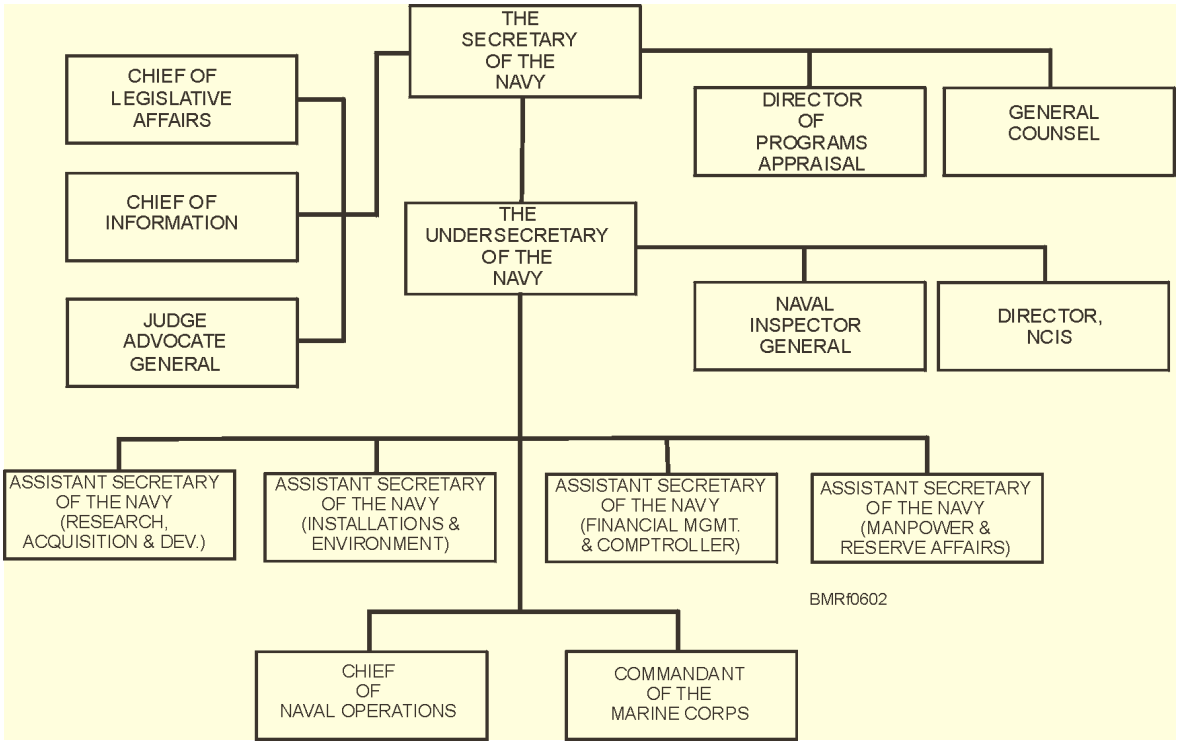

Figure 6-2.—Organizational chart of the Department of the Navy (DoN).

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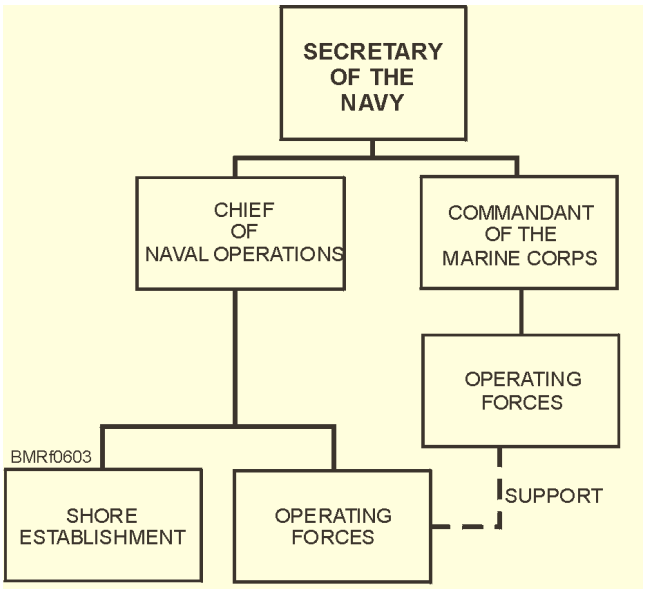

Figure 6-3.—Overview of the DoN.

THE OPERATING FORCES

The operating forces (fig. 6-4) consist primarily of combat and service forces, including several fleets and the Fleet Marine Forces. They include the Coast Guard (when operating as a part of the Navy) and other forces and activities under the command of the Chief of Naval Operations (CNO). You can get more information on the operating forces by going to the web page mentioned above. You'll also learn more about the operating forces when you complete the *Military Requirements for Petty Officer Third Class*, NAVEDTRA 12024.

THE SHORE ESTABLISHMENT

The shore establishment (fig. 6-5) provides support to the operating forces (known as *the fleet*). The support is in the form of facilities for the repair of machinery and electronics; communications centers; training areas and simulators; ship and aircraft repair; intelligence and meteorological support; storage areas for repair parts,

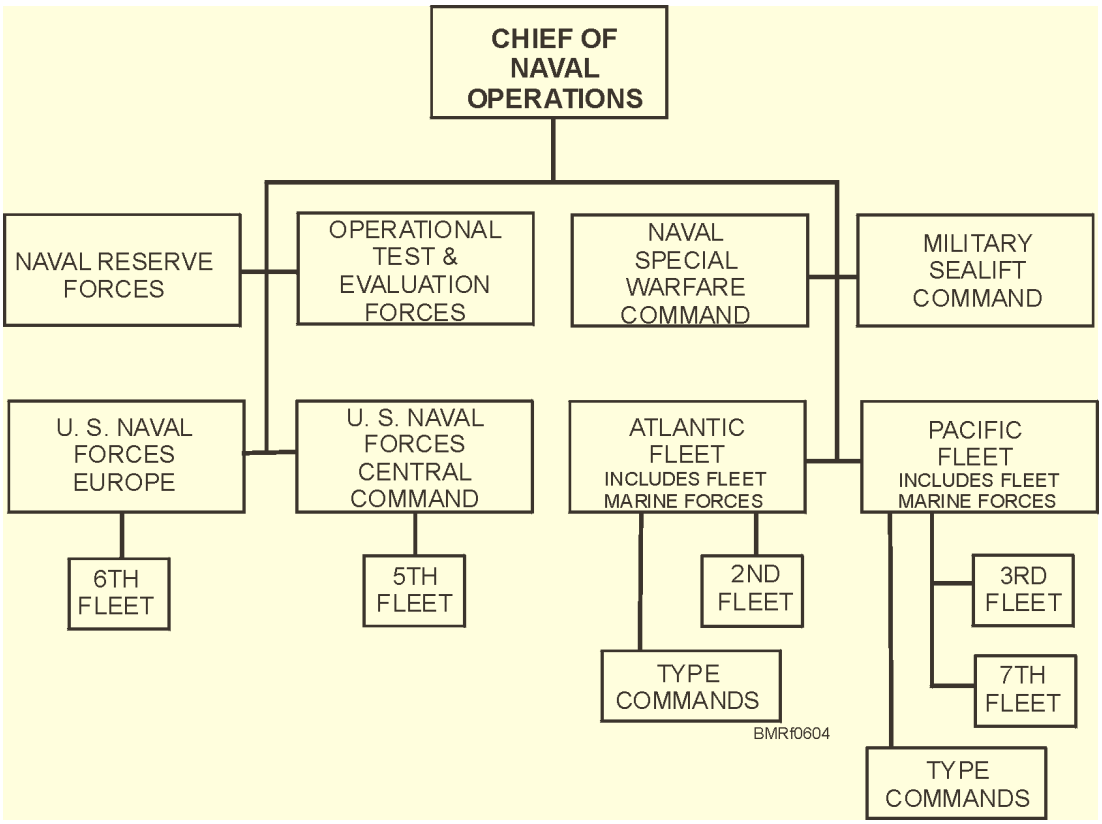

Figure 6-4.—Operating forces.

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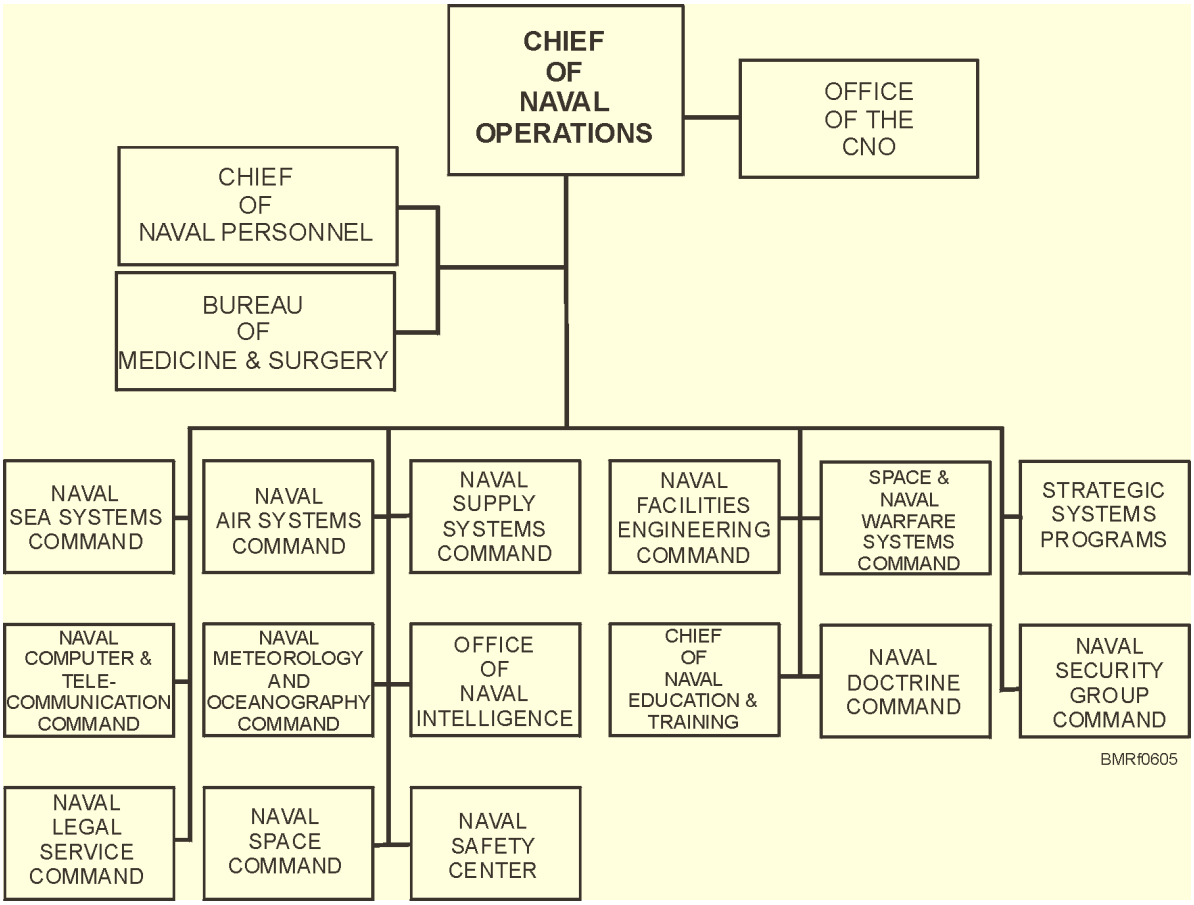

Figure 6-5.—Shore establishment.

fuel, and munitions; medical and dental facilities; and air bases. You can learn more about the commands shown here by going to the Internet web page mentioned above. Also, you'll learn more about the Shore Establishment when you complete the *Military Requirements for Petty Officer Third Class,* NAVEDTRA 12024.

REVIEW 1 QUESTIONS

Q1. List the three military departments of the Department of Defense (DoD).

a.

b.

c.

Q2. Describe the four missions of the DoD.

a.

b.

c.

d.

Q3. What are the two main objectives of the Navy?

a.

b.

Student Notes:

Q4. List the three basic components of the Department of the Navy.

a.

b.

c.

Q5. The U.S. Coast Guard operates under different departments. List the department the Coast Guard operates under in the two conditions shown below.

a. Wartime—

b. Peacetime—

UNIT ORGANIZATION

Learning Objectives: When you finish this chapter, you will be able to—

- Recognize the purpose and scope of the *Shipboard Organization and Regulations Manual*.
- Recall the application of the *Standard Organization and Regulations of the U.S. Navy* to unit organization to include ships'/ commands' organization and regulations manual.

The purpose of a unit's organization is to help accomplish the mission of that unit. Each unit has its own mission in support of the overall mission of the Navy; however, each unit has the same basic organization. The *Standard Organizational and Regulations of the U.S. Navy,* OPNAVINST 3120.32, is used as a guide for unit organization.

STANDARD ORGANIZATION AND REGULATIONS OF THE U.S. NAVY

Standard Organization and Regulations of the U.S. Navy describes the many aspects of the standard unit organization. Each unit in the Navy has a ship's/command's organization and regulations manual based on the *Standard Organization and Regulations of the U.S. Navy.* Aboard ship, this manual is usually referred to as the *Shipboard Organization and Regulations Manual*.

SHIP'S/COMMAND'S ORGANIZATION AND REGULATIONS MANUAL

The ship's/command's organization and regulations manual governs the unit's administrative organization (including watches). It governs the coordination of evolutions and emergency procedures and the conduct of personnel in the unit. Its purpose is to provide a ready source of information about the duties, responsibilities, and authority of unit personnel. Ships/ commands usually require all newly reporting personnel to read the manual and sign a statement to that effect.

Discussing the organization of every unit in the Navy would be impossible. Therefore, you will learn about a standard shipboard organization and a standard aircraft squadron organization in this chapter.

REVIEW 2 QUESTIONS

Q1. Aboard ship, you can find the ship's organization and regulations in what publication?

Q2. List some aspects of a ship's organization that are covered by the *Standard Organization and Regulations Manual.*

a.

b.

c.

SHIPBOARD ORGANIZATION

Learning Objectives: When you finish this chapter, you will be able to—

- Recall shipboard organization to include battle organization and administrative organization.

Student Notes:

- Identify the duties and responsibilities of the commanding officer, executive officer, department head, and division officer.

The officers and enlisted personnel make up a ship's wartime organization. They keep the ship in a state of readiness to fight a war. During peacetime operations, the ship's organization can be expanded if a wartime operation becomes necessary. The two elements of the ship's organization are the **battle organization** and the **administrative organization**.

THE BATTLE ORGANIZATION

The battle organization contains a list of the numbers and specialties of the personnel a unit will need to fulfill the wartime missions. The unit's battle organization depends on its armament, equipment, and personnel. As a part of the battle organization, you should know your assignments as posted on the Watch, Quarter, and Station Bill.

THE ADMINISTRATIVE ORGANIZATION

The administrative organization makes sure that the ship can fight or carry out its mission. Training, maintenance, and routine operations are covered by the administrative organization. The commanding officer (CO) is the head of the organization. He/she is assisted by the executive officer (XO) and other officers.

Look at figure 6-6. Each ship is organized into at least five departments—navigation, engineering, operations, supply, and a fifth department. For most ships, the fifth department is the weapons/deck department. Some ships have a separate deck department in addition to a weapons department, and some have a deck department instead of a weapons/deck department. Specially designated ships have a combat systems department instead of a weapons or weapons/deck department. Additional departments may be assigned according to ship type. Some of these departments are air, medical, dental, and repair.

Each department is under a department head. Departments are usually divided into divisions under a division officer. Each division is subdivided into sections, usually under senior petty officers. The following paragraphs describe the responsibilities of the five standard departments.

Navigation Department

The navigation department is responsible for the safe navigation and piloting of the ship. It is responsible for the operation, care, and maintenance of navigation equipment, charts, publications, and records.

Operations Department

The operations department has several divisions to carry out tasks such as collecting and evaluating

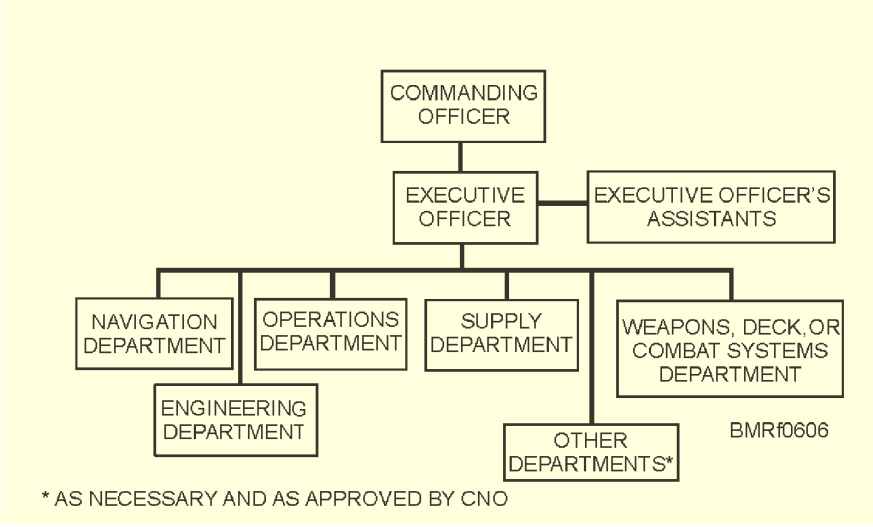

Figure 6-6.—Typical ship organizational chart.

Student Notes:

combat and operational information and conducting electronic warfare. Other tasks involve gathering and analyzing intelligence information, repairing electronic equipment, controlling aircraft, and forecasting weather. The operations department is usually in charge of all the radar, sonar, and communications equipment on the ship. The combat information center (CIC) is part of the operations department.

Supply Department

The supply department has many responsibilities. Some of these are—

- Operating the general mess, including preparing and serving food.
- Operating the ship's store, which provides personal articles for the ship's crew.
- Managing the clothing and small stores issue room, where crew members may buy uniform items.
- Maintaining the pay records of the crew (done by the disbursing office).
- Ordering and receiving general stores, supplies, spare parts, and equipment for the ship. In fact, just about everything that comes aboard the ship, other than people, is ordered by the supply department.

Engineering Department

The engineering department, under the engineer officer, is responsible for the operation, care, and maintenance of all propulsion and auxiliary machinery. It is responsible for the control of damage resulting from fire, explosion, collision, and so forth. The engineering department provides power, light, ventilation, heat, refrigeration, compressed air, and freshwater throughout the ship. The engineer officer may have several assistants, such as the main propulsion assistant, the damage control assistant, and the electrical officer.

Weapons/Deck/Combat Systems Department

The fifth department of ship's administrative organization varies. Some of the departments are listed below.

1. Surface combatants (ships) using ordnance (gun batteries, torpedoes, missiles, and so forth) have a **weapons department**, headed by a weapons officer.
2. Surface combatants (ships) with complex combat systems and some classes of submarines have **combat systems departments**, headed by combat systems officers.
3. Ships with offensive capabilities unrelated to ordnance have a **deck department**, headed by the first lieutenant.
4. Aircraft carriers and some other ships have a **weapons** or **combat systems department** in addition to a deck department.

In ships that have a weapons department or combat systems department, the **weapons** or **combat systems officer** is responsible for—

- The operation, care, and maintenance of the ship's armament and the weapons fire-control equipment.
- The care, handling, stowage, accountability, and issue of ammunition and pyrotechnics.
- The maintenance of magazines and the external security of the ship.
- If the ship doesn't have an air department the weapons department is responsible for

  —The launch and recovery of assigned aircraft

- If the ship doesn't have a deck department, the weapons department is responsible for

  —The preservation and cleanliness of the external areas of the ship not assigned to other departments.

  —The operation of the paint, sail, and boatswains' lockers and inspection and maintenance of survival equipment.

Student Notes:

—All decking seamanship operations and the care and use of deck equipment.

- If the ship has a deck department but no weapons or combat systems department

  —The first lieutenant (head of the deck department) is responsible for deck functions.

- If the ship has a combat systems department but no deck department

  —The operations department is responsible for deck functions.

COMMANDING OFFICER

The commanding officer (CO) has many and varied duties. The CO has so many duties that one entire chapter in *Navy Regulations*, consisting of nearly 70 articles, applies to commanding officers. In general, the CO is responsible for the safety, well-being, and efficiency of the command.

The commanding officer's responsibilities include the safe navigation of the ship and the condition and appearance of the material and personnel. The CO must also ensure the proper stationing of trained lookouts and the preparation of the ship for battle. The CO may delegate authority in these matters, but such delegation does not relieve the CO of responsibility. The officer of the deck (OOD), for example, has authority to run the ship; but if a collision occurs, the CO is still responsible.

The commanding officer must exert every effort to maintain the command in a state of maximum readiness for war. The commanding officer issues the necessary directions to the executive officer (XO). With the assistance of the various department heads, the XO then prepares and conducts exercises and drills needed to prepare the ship for battle.

During combat, the commanding officer directs the members of the crew in fighting to the best of their ability until action is complete. The CO's battle station is where the CO can best direct the fighting. If the ship should sink, both custom and regulations require the commanding officer to assure the completion of abandon ship procedures. All personnel should be off the ship before the commanding officer leaves.

The CO's power is authoritative and complete. With ultimate responsibility for the ship and everything pertaining to it, the commanding officer must have authority equal to the responsibility. To ensure efficiency, responsibility, and discipline, the commanding officer must have the power to enforce prompt obedience to orders. According to the *Uniform Code of Military Justice (UCMJ*), the commanding officer has the power to impose limited punishment. This power is a part of a CO's command responsibility and may not be delegated.

Since the ship has only one CO but many crew members, a senior enlisted member gives advice on enlisted policies and informs the CO about the health, welfare, and general well-being of the crew. The senior enlisted member acts as a liaison between the officer and enlisted community. The senior enlisted member assigned to assist the CO is a master chief, a senior chief, or a chief petty officer (depending on the senior rate within the command). This person receives assignment as the command master chief (CM/C), command senior chief (CS/C), or command chief (CCh). This senior enlisted member transmits ideas and recommendations directly to the commanding officer.

If the CO is absent, disabled, relieved from duty, or detached without relief, another officer must assume the CO's responsibilities. This person is the next senior line officer that is eligible for command at sea, and who is attached to and aboard the ship. In most cases, this person is the executive officer.

EXECUTIVE OFFICER

The executive officer (XO) is the aide or "executive" to the commanding officer. The XO is usually the next ranking line officer aboard ship. As such, the XO is the direct representative of the commanding officer in maintaining the general efficiency of the ship. Some of the XO's responsibilities include the following:

- The command's assigned personnel. With the help of department heads, the XO arranges and coordinates all ship's work, drills, exercises, and policing and inspecting the ship.

Student Notes:

- Investigate matters affecting the discipline and conduct of the crew and makes recommendations concerning these matters to the commanding officer.
- Approve or disapprove liberty lists and leave requests.
- Inspect the ship and receive readiness reports from the various department heads when the ship is cleared for action; then report to the CO when the ship is ready for action.

If the captain is disabled during battle, the XO normally becomes the acting commanding officer. For this reason, the location of the XO's battle station (determined by the captain) is some distance from the captain's. This prevents disablement of both officers at the same time.

After a battle, the executive officer makes a detailed report to the commanding officer.

If the XO cannot fulfill the duties of the commanding officer, normally, the next senior line officer assigned to the ship assumes the duties of the commanding officer.

Depending on the size of the ship, the executive officer may have one or more assistants. Some of these assistants and their responsibilities are as follows:

Personnel officer. The personnel officer assigns personnel to the various departments, berthing arrangements, and to the task of maintaining enlisted service records.

Training officer. The training officer secures school quotas, schedules orientation courses for newly reporting personnel, and helps prepare long- and short-range training schedules.

Educational services officer (ESO). The educational services officer (ESO) receipts for, maintains, and distributes educational courses and training aids.

Drug and alcohol program advisor (DAPA). The drug and alcohol program advisor (DAPA) advises the CO and XO on all matters concerning the Navy's Drug and Alcohol Abuse Program. The DAPA provides onboard education, prevention, screening, command counseling, aftercare, probationary supervision, motivational training, and referral services.

Command master chief (CM/C). While serving as one of the XO's assistants, the CM/C has direct access to the CO and is the voice of all enlisted personnel.

In addition to these assistants, the executive officer may also have a legal officer, combat cargo officer, safety officer, and others as required. The master-at-arms force also works directly under the executive officer.

DEPARTMENT HEAD

As the representative of the commanding officer, the department head is responsible for and reports to the CO about all matters that affect the department. That includes administrative matters, the operational readiness of the department, and the general condition of equipment.

DIVISION OFFICER

The division is the basic unit of the shipboard organization. The CO assigns division officers to command the divisions of the ship's organization. Division officers are responsible to and, in general, act as assistants to department heads.

The number of divisions in a department varies among ships, with each division having only a few assigned personnel to as many as 200 personnel. The division officer is a major link in your chain of command, particularly in a small ship. At the working level, the division officer carries out command policies and personally sees that division tasks are completed in a timely manner. Some of the division officer's duties include—

- Making frequent inspections of division personnel, spaces, equipment, and supplies
- Maintaining copies of all division orders and bills and displaying them in a conspicuous place
- Training division personnel and preparing them for battle

Student Notes:

REVIEW 3 QUESTIONS

Q1. List the two elements of a ship's organization.

a.

b.

Q2. List the information contained in elements of a ship's organization.

a.

b.

Q3. Briefly describe the responsibility of the five departments listed below.

a. Navigation—

b. Operations—

c. Engineering—

d. Supply—

e. Weapons/Deck/Combat Systems—

Q4. What regulation has an entire chapter covering commanding officer duties?

Q5. Aboard ship, what officer is responsible for the safe navigation of the ship, the condition of the ship, and the appearance of material and personnel?

Q6. A CO must have authority equal to responsibility, including the power to impose limited punishment. Can the CO delegate this particular power?

Q7. What enlisted person transmits ideas and recommendations directly to the CO?

Q8. Describe four duties of the XO.

a.

b.

c.

d.

Q9. List the XO's assistants.

a.

b.

c.

d.

e.

Q10. What are the responsibilities of the department head?

Student Notes:

Q11. What is the basic unit of a shipboard organization?

Q12. List three division officer duties.

a.

b.

c.

AIRCRAFT SQUADRON ORGANIZATION

Learning Objective: When you finish this chapter, you will be able to—

- Recall aircraft squadron organization to include squadron departments and branch officer.

The organization of an aircraft squadron differs in some ways from that of a ship. *Standard Organization and Regulations of the U.S. Navy* specifies the basic organization required of an aircraft squadron. Figure 6-7 shows a standard organizational chart of an aircraft squadron.

Look at figure 6-7 again. As you can see, an aircraft squadron has different departments than a ship. This is one of the differences between the organization of an aircraft squadron and a ship. The departments have different names and responsibilities. However, the responsibilities of the commanding officer, executive officer, department heads, and division officers are the same in the organization of an aircraft squadron and a ship.

AIRCRAFT SQUADRON DEPARTMENTS

All aircraft squadrons have an administrative department and a safety department. Most squadrons also have an operations department and a maintenance department. Some squadrons have one or more departments in addition to the four already mentioned. Based on its mission, the squadron may have a training, a photographic, or an intelligence department.

Administrative Department

The administrative (ADMIN) department is responsible for all the administrative duties within the squadron. This department takes care of official correspondence, personnel records, and directives. Most of the jobs done by the XO's assistants in a shipboard organization are done by ADMIN in an aircraft squadron. The first lieutenant and command career counselor work as members of the ADMIN

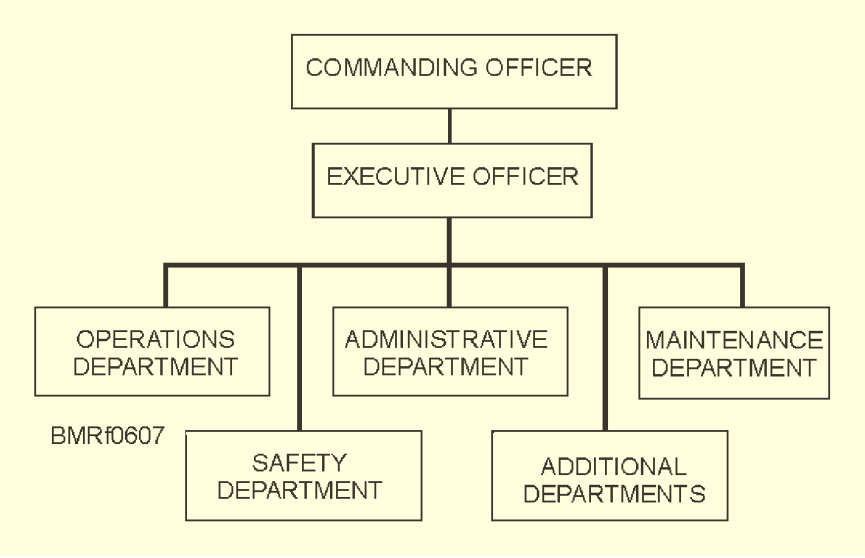

Figure 6-7.—Type aircraft squadron organization chart.

Student Notes:

department. Other parts of the administrative department include the following:

- Personnel office
- Educational services office
- Public affairs office
- Legal office

Safety Department

The safety department is responsible for all squadron safety program matters. This department is usually divided into the following:

- Ground safety.
- Aviation safety.
- Naval Air Training and Operating Procedures Standardization (NATOPS) divisions. (The NATOPS division makes sure standardized procedures are followed in the operation of the squadron's aircraft.)

Operations Department

The operations department is responsible for the operational readiness and tactical efficiency of the squadron. The operations department usually consists of the logs and records, schedules, training, communications, and navigation divisions.

Maintenance Department

The maintenance department is responsible for the overall maintenance of the squadron's aircraft. The maintenance department is usually divided into the following divisions:

- Maintenance/material control
- Quality assurance
- Maintenance administration
- Aircraft, avionics/armament, and airframes divisions

BRANCH OFFICER

A division on a ship is divided into watches or sections or both. In an aircraft squadron, the divisions are divided into branches. Each branch is headed by a branch officer. In aircraft squadrons, the branch officer is the officer with whom you will have the most direct contact.

The branch officer is directly responsible to the division officer. The branch officer has the same responsibilities for the branch that the division officer has for the division.

- Making frequent inspections of branch personnel, spaces, equipment, and supplies.
- Making sure branch tasks are completed in a timely manner.

REVIEW 4 QUESTIONS

Q1. List the four departments usually found in an aircraft squadron.

a.

b.

c.

d.

Q2. The safety department is responsible for the squadron safety program. What are the main divisions in this department?

a.

b.

c.

Q3. What is the responsibility of the operations department?

Student Notes:

Q4. List the four divisions of the maintenance department.

a.

b.

c.

d.

Q5. The branch officer is responsible to what officer?

CHAIN OF COMMAND

Learning Objectives: When you finish this chapter, you will be able to—

- Identify the purpose of the chain of command to include responsibilities, direction, communications, and solving work-related problems.
- Recognize a typical chain of command.

The chain of command is the relationship of juniors and seniors within an organization. The organizational charts you have seen in this chapter represent chains of command.

An effective chain of command is essential for the Navy to carry out its assigned mission. Good leadership is also essential for the Navy's mission. Good leadership supports an effective chain of command and vice versa; neither works well without the other.

The chain of command serves several purposes in the accomplishment of the Navy's mission. It defines responsibilities and identifies accountability. Properly used, it provides direction and smooth communications and ensures efficiency.

RESPONSIBILITY

Responsibility requires that an individual be accountable for the performance of assigned tasks within an organization. By defining responsibilities, the chain of command lets its personnel know what their responsibilities are and what they are expected to do.

The Navy expects its personnel to set good examples for their shipmates by doing their jobs quickly, correctly, and neatly. The Navy expects its members to instill a sense of pride in others to improve the efficiency of the command.

ACCOUNTABILITY

Every person in a chain of command is accountable to someone for professional performance and personal actions. Accountability is the ability of personnel to report, explain, or justify every action taken. They do this through two types of accountability—job accountability and military accountability.

1. *Job accountability* means you must answer to seniors in the chain of command for the way in which you carry out an assigned task.
2. *Military accountability* means you must answer to senior military personnel for your personal behavior and military appearance.

DIRECTION

The chain of command provides direction in the assignment of duties. All members of the chain of command know their specific duties. Seniors assign these duties, and juniors should carry them out to the best of their ability.

COMMUNICATION

The chain of command provides for smooth, rapid, and effective communication. Each person in the chain of command needs to clearly understand his/her status within that chain. Seniors should pass information down the chain of command about matters that may affect juniors. Juniors should pass information up the chain of command about problems that exist. In this way, communication flows in both directions.

Student Notes:

WORK-RELATED PROBLEMS

Work-related problems are situations that affect a person's job performance. A work-related problem might be a situation in which a person feels mistreated by a senior. It could also be a situation in which a person needs leave or liberty because of an illness in the family.

The chain of command is responsible to each Navy member for solving work-related problems. When a person's immediate senior is unable to resolve a problem, the next senior in the chain of command tries to solve the problem. If the senior at that level of command is unable to resolve the problem, it then goes to the next level in the chain of command. The problem continues to be referred to each level in the chain of command until it is resolved. **You must always use the chain of command when seeking solutions to work-related problems.**

TYPICAL CHAIN OF COMMAND

Figure 6-8 shows a typical shipboard, straight-line chain of command from the nonrated level to the commanding officer. An aircraft squadron's chain of command includes a branch officer.

For watch-standing assignments, the chain of command includes a section leader (not shown). The section leader may be from your division but often is a petty officer from another division. The section leader makes watch assignments for all personnel assigned to the section. Inform the section leader of situations, such as leave or special liberty, that affect your availability for watch assignments.

In most cases, the chain of command shown in figure 6-8 is complete. However, the chain of command does not stop with the commanding officer. **Remember, all people in the military are responsible to their seniors**!

The chain of command extends from nonrated personnel all the way to the President of the United States. Figure 6-8 shows the shipboard chain of command from the nonrated person to the commanding officer. Figure 6-9 shows a typical chain of command from the President to the commanding officer of a ship. To learn your chain of command, ask someone in the administrative (Admin) office to show you the command's organizational chart.

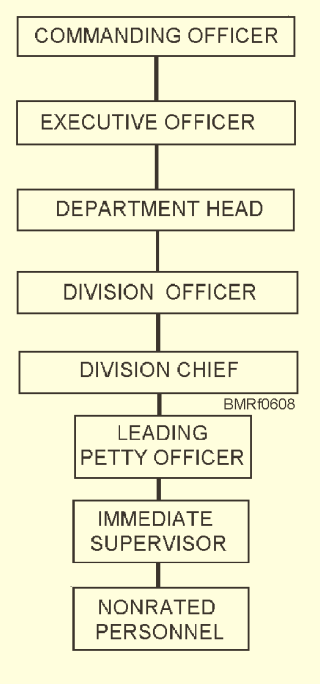

Figure 6-8.—Typical shipboard chain of command.

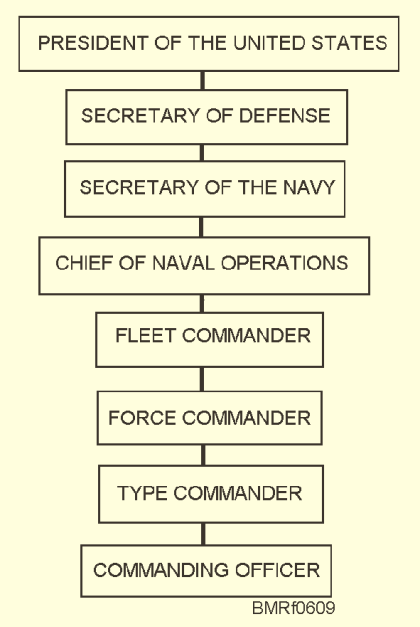

Figure 6-9.—Typical chain of command from the CO of a ship to the President.

Student Notes:

REVIEW 5 QUESTIONS

Q1. The chain of command defines the relationship of juniors and seniors in an organization. List the five areas that affect the chain of command.

a.

b.

c.

d.

e.

Q2. In your organization, you can find out about the chain of command by asking someone in what office?

SUMMARY

Where do I go? What do I do? Who is in charge? With the Navy's organizational structure, all personnel, from the CNO to the newest crew member, know what their job is, where they work, and who their supervisor is. Think about being at sea; its midnight and the general alarm sounds. Are the gun mounts manned by personnel trained to handle them or just by the people that showed up first? What about the repair lockers, the engine rooms, or the bridge?

Without an organization that ensures properly trained personnel manning each billet, our ships could not be in a continual high state of readiness.

What about a problem in the work space? Who do we tell about it? Do we tell the department head or the captain?

Our chain of command works in both directions, up and down. The upper level keeps us informed of the types of operations being conducted and what types of hazards we face. The people in the lower levels must keep the upper levels informed of all difficulties experienced in the performance of assigned duties. Every level in the chain of command is an integral part of a team. Members at each level must do their part to make sure their command functions effectively.

Flight deck operations are a good example of the effects of proper organization. Ships could never carry out these operations without superior organization. Every person knowing where to report, what job to do, and who to tell when things go wrong—that's organization.

Student Notes:

REVIEW 1 ANSWERS

A1. The three military departments of the Department of Defense (DoD) are the—

a. **Navy,**

b. **Army,** and

c. **Air Force**.

A2. The four missions of the DoD are—

a. **To support and defend the Constitution of the United States against all enemies, foreign and domestic**

b. **To ensure the security of the United States, its possessions, and areas vital to its interests**

c. **To uphold and advance the national policies and interests of the United States**

d. **To safeguard the internal security of the United States**

A3. The two main objectives of the Navy are to—

a. **Organize, train, equip, prepare, and maintain the readiness of the Navy and Marine corps forces to perform military missions**

b. **To support the Navy and Marine Corps forces as well as the forces of other military departments**

A4. The three basic components of the Department of the Navy are—

a. **Navy Department**

b. **Operating forces**

c. **Shore Establishment**

A5. The U.S. Coast Guard operates under the following two departments:

a. Wartime—**Department of the Navy**

b. Peacetime—**Department of Transportation**

REVIEW 2 ANSWERS

A1. Aboard ship, the ship's organization and regulations can be found in a publication known as the ***Shipboard Organization and Regulations Manual***, which is based on the ***Standard Organization and Regulations of the U.S. Navy***.

A2. Some aspects of a ship's organization covered by the *Shipboard Organization and Regulations Manual* include—

a. **Unit's admin organization, including watches**

b. **Coordination of evolutions and emergency procedures**

c. **Conduct of personnel**

REVIEW 3 ANSWERS

A1. The two elements of a ship's organization are the—

a. **Battle organization**

b. **Administration organization**

A2. The information contained in the—

a. Battle organization includes the **numbers and specialties the unit needs to fulfill its wartime missions**

b. Administration organization **makes sure the ship can fight or carry out its mission; training, maintenance, and routine operations are covered**

A3. The responsibilities of the departments are—

a. Navigation—**Safe navigation and piloting of the ship**

b. Operations—**In charge of all radar, sonar, and communications equipment on the ship. Operations collects and evaluates combat and operational information and conducts electronic warfare**

c. Engineering—**Operation, care, and maintenance of all propulsion and auxiliary machinery**

d. Supply—**Operates the general mess and ship's store; manages clothing and small stores issue room; maintains pay records; and orders and receives general stores, supplies, spare parts, and ship's equipment**

e. Weapons/Deck/Combat Systems—**Responsibilities depend on type of ship**.

1) Weapons department or combat systems department—**Operation, care, and maintenance of ships armament and weapons fire-control equipment**

2) Deck department—**Responsible for deck functions**

A4. The ***Navy Regs*** has an entire chapter covering commanding officer duties.

A5. Aboard ship, the **commanding officer** is responsible for the safe navigation of the ship, the condition of the ship, and the appearance of material and personnel.

A6. A CO has authority equal to responsibility, including the power to impose limited punishment. **This power can't be delegated**.

A7. The **senior enlisted person** transmits ideas and recommendations directly to the CO.

A8. Duties of the XO include—

a. **Arranging and coordinating ship/s work, drills, exercises, and policing and inspecting the ship**

b. **Investigating matters affecting crew discipline and conduct. Making recommendations to CO on these matters**

c. **Approving/disapproving liberty lists and leave requests**

d. **Inspecting the ship and receiving readiness reports from department heads; reporting to the CO when the ship is ready for action**

A9. Assistants to the XO include—

a. **Personnel officer**

b. **Training officer**

c. **Educational services officer (ESO)**

d. **Drug and alcohol program advisor (DAPA)**

e. **Command master chief (CM/C)**

A10. The department head is responsible for and reports to the CO on **matters that affect his/her department including administrative matters, operational readiness, and general condition of the equipment.**

A11. The **division** is the basic unit of a shipboard organization.

A12. Division officer duties include—

a. **Inspecting division personnel, spaces, equipment, and supplies**

b. **Maintaining copies of division orders and bills and displaying them in conspicuous places**

c. **Training division personnel and preparing them for battle**

REVIEW 4 ANSWERS

A1. The four departments usually found in aircraft squadrons include—

a. **Administration**

b. **Safety**

c. **Operations**

d. **Maintenance**

A2. The safety department is usually divided into

a. **Ground safety**

b. **Aviation safety**

c. **Naval Air Training and Operating Procedures Standardization (NATOPS)**

A3. The operations department is responsible for the **operational readiness and tactical efficiency of the squadron**.

A4. The four divisions of an aircraft maintenance department are the—

a. **Maintenance/material control**

b. **Quality assurance**

c. **Maintenance administration**

d. **Aircraft, avionics/armament, and airframes divisions**

A5. The branch officer is responsible to the **division officer**.

REVIEW 5 ANSWERS

A1. The five areas that affect the chain of command are—

a. **Responsibility**

b. **Accountability**

c. **Direction**

d. **Communication**

e. **Work-related problems**

A2. In your organization, you can find out about the chain of command by **asking someone in the administration office.**

CHAPTER 7

BASIC SEAMANSHIP

To ensure safety at sea, the best that science can devise and that naval organization can provide must be regarded only as an aid, and never as a substitute for good seamanship, self-reliance, and sense of ultimate responsibility which are the first requisites in a seaman…

—C.W. Nimitz
Letter to U.S. Pacific Fleet
13 February 1945

At this stage in your Navy career, you're learning thousands of things entirely new to you. You're probably finding it hard to assign relative importance to them. The importance of these skills and knowledge will become more obvious the longer you're in the Navy. This is true because the most important things will be emphasized in your day-to-day living. If you're not assigned to the deck force, you may think that seamanship is not important. Well, you're wrong!

Seamanship ties every member of the Navy together. The uniform worn by Navy members, from seaman to admiral, implies that the wearer has a certain degree of proficiency in the art of seamanship. The fact that you may later become an Electronics Technician doesn't change the fact that you're first a seaman and then a technician. Be as proud of your ability as a seaman as you are of your ability to perform your other duties.

Even though you don't work on deck everyday, there will be times, particularly on small ships, when you will be required to assist the deck force. You may have to carry stores, assist in replenishment-at-sea operations, assist in mooring to or untying a ship from the pier, and so forth. When working as part of the deck force, you'll be expected to have a general idea of what's going on, how and why a task is being accomplished, and be able to carry out orders intelligently. Therefore, take every opportunity to observe and learn as much as you can about seamanship. This chapter provides only basic seamanship information.

In this chapter, seamanship is divided into the following basic sections—deck, boat, and marlinespike seamanship.

- Deck seamanship concerns the general work that goes on about the ship's deck and the equipment used. Anchoring, mooring, rigging and handling heavy weights and cargo, underway replenishment, towing, and a host of other skills are considered deck seamanship.

- Boat seamanship, as the name implies, concerns the handling of boats.

- Marlinespike seamanship concerns the use and care of line and consists of forming knots, making splices, and fashioning useful and decorative articles from small stuff and twine.

DECK SEAMANSHIP

Learning Objective: When you finish this chapter, you will be able to—

- Identify deck equipment and recognize their purpose.

Deck equipment consists of all equipment used in the application of deck seamanship, which is work normally performed by the deck force. You need to know shipboard equipment and terminology because you may be called on to assist the deck force in various seamanship evolutions. To help you, some of the more familiar items of deck equipment are discussed in this section.

GROUND TACKLE

Ground tackle is the equipment used in anchoring and mooring with anchors. It includes anchors, anchor cables and chains, and associated equipment, such as chain stoppers, bending shackles, outboard swivel shots, and detachable links. Figure 7-1 shows a typical ground tackle arrangement on a forecastle.

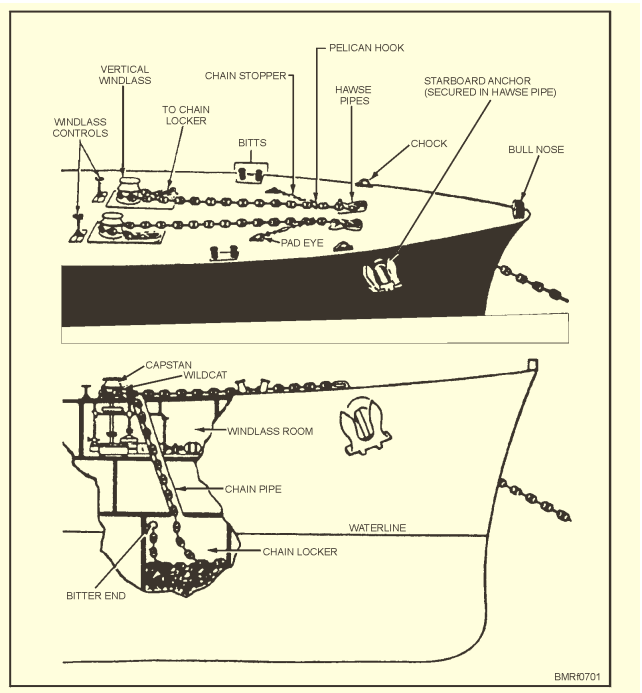

Figure 7-1.—Typical ground tackle and chain stowage.

ANCHORS

Anchors can be defined by their stowage locations aboard ship or by their type of construction. Bower anchors are carried on the bow and are secured (housed) in the hawsepipes. Stern anchors are carried on the stern. On landing ships and craft, stern anchors are secured to the stern and are used to help pull away from beaches.

The most common types of anchors used aboard ship are the stockless and the lightweight (or stock-in-crown) anchors. The two anchors shown in figure 7-2 are of Navy design. The stockless types are used chiefly as bow anchors (bowers) on most Navy ships. Originally, the lightweight types were used only on small boats and as stern anchors of landing ships and craft. However, recently they are carried as bowers for several types of vessels.

ANCHOR CHAIN

Modern Navy anchor chain consists of studded links of high strength steel. (Studs are crosspieces of metal forged or welded in the center of the links to prevent the chain from kinking.) Chains are made up of 15-fathom (90-foot) sections called *standard shots*. The number of shots per chain depends on the size of the ship. Shots are secured together by detachable links that can be readily disassembled whenever it is desirable to break the chain.

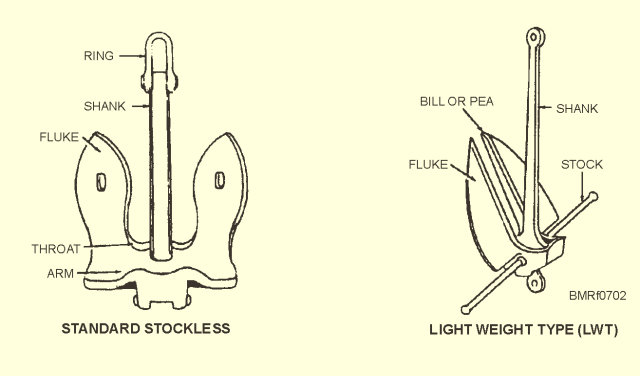

Figure 7-2.—Anchors.

STOWING CHAIN

As the chain comes aboard, it passes along the deck on metal flash plates, over the wildcat, and down into the chain locker. Each chain goes into a bin called a chain locker, as shown in figure 7-1. Its *bitter end* is secured to a ring bolt on the bulkhead of the chain locker.

ANCHOR WINDLASSES

The Navy uses two types of anchor windlasses for lifting the ship's anchor—the vertical shaft type and the horizontal shaft type (fig. 7-3). The vertical shaft type is used on most combatant ships. The horizontal shaft type is used on amphibious and auxiliary ships. Both types are equipped with wildcats, which engage the links of the anchor chain. The wildcat may be disengaged when it is desired to use the capstan (vertical type) or the gypsy heads (horizontal type) for handling lines or wire.

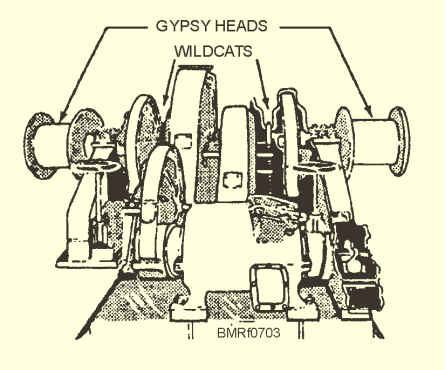

Figure 7-3.—Horizontal shaft anchor windlass.

Student Notes:

ACCOMMODATION LADDER

Frequently, the accommodation ladder is mistakenly called the gangway. However, gangway actually means *the opening in a bulwark or life rail that gives access to a brow or an accommodation ladder.* An accommodation ladder (fig. 7-4) consists essentially of an upper and a lower platform connected by a ladder. The lower end is supported, raised, and lowered by a block and tackle (called *falls*) and is usually suspended from a davit.

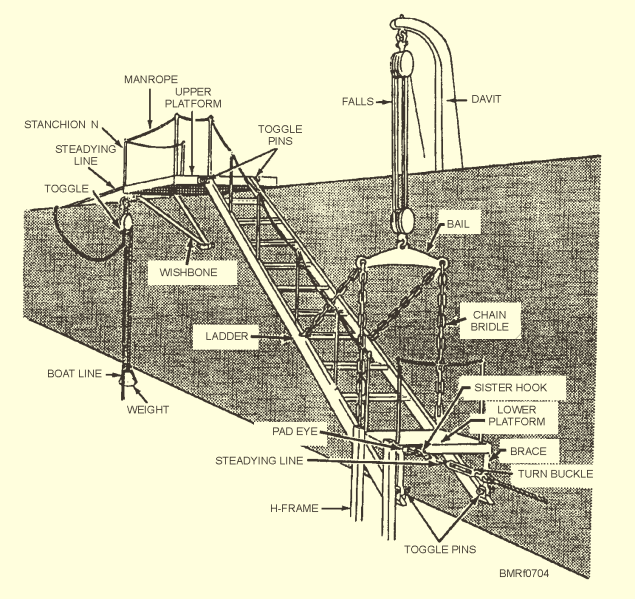

Figure 7-4.—A rigged accommodation ladder.

Brow is the Navy term for gangplank. Brows are ramps used between ships and between a ship and pier. They may be simply two or three wooden planks fastened together, or they may be elaborate affairs with handrails and wheels at one or both ends to prevent a ship's motion from unduly affecting the positioning of the brow.

MOORING LINES

A ship is moored when it's made fast to a buoy, when it's between two buoys, when it's between two anchors, or when it's secured by lines alongside a pier or another ship.

The lines used in mooring a ship alongside a pier are shown in figure 7-5. Well in advance of mooring, the lines should be faked down, fore and aft, each near the chock through which it passes in preparation for passing the line. You will learn about the procedure for faking a line and a description of deck fittings later in this chapter.

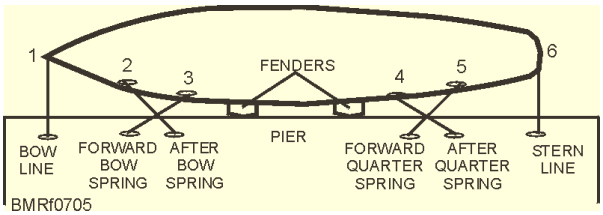

Figure 7-5.—Ship's mooring lines.

Rat guards are hinged conical metal shields secured around mooring lines. They are used to prevent rats from coming aboard ship.

The bowline and forward spring lines prevent the ship from drifting astern. The stern line and after spring lines prevent the ship from drifting forward. Look at figure 7-5. Here, lines 1, 3, and 5 are called *forward lines*; lines 2, 4, and 6 are called *after lines*. When secured, these lines tend to breast the ship in. The forward and after spring lines are used to prevent the ship from drifting forward or aft.

NOTE

The various types of line and wire rope are discussed in the "Marlinespike Seamanship" section of this chapter.

Teamwork is essential in carrying out the mooring operation. Lines must not be kinked or fouled. Keep control of the lines and avoid dipping them into the water. **Remember, observe all safety precautions!**

If the ship is to remain moored for a long period, lines are doubled up and bound together with marline hitches, and rat guards are placed on each line. Look at figure 7-6. To provide protection to the side of the ship while it is alongside a pier, *camels* (large wooden logs or rectangular structures) (views B and C) are often placed between the pier and the ship. *Fenders* (large cylindrical objects of rubber or fibrous material) (views A and D) are swung over the side of the ship to give bumper support against damage whenever a ship lies alongside another ship or a pier.

Student Notes:

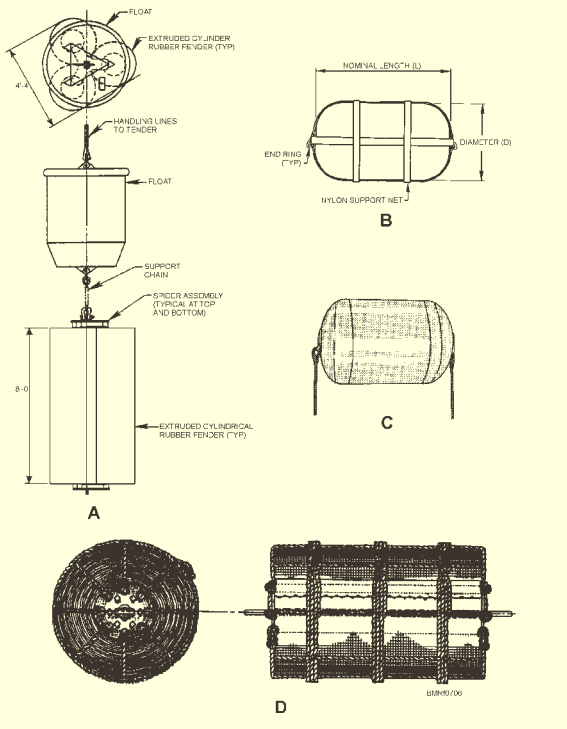

Figure 7-6.—Protection for the side of a ship.

DECK FITTINGS

Deck fittings are used aboard ships and boats mainly for the securing of mooring lines. All fittings shown in figure 7-7 are found aboard ship except the bollard, which is a pier fitting. The pad eye shown in the figure is not used for mooring but for towing other vessels. Different variations of the pad eye are used for securing heavy objects and equipment.

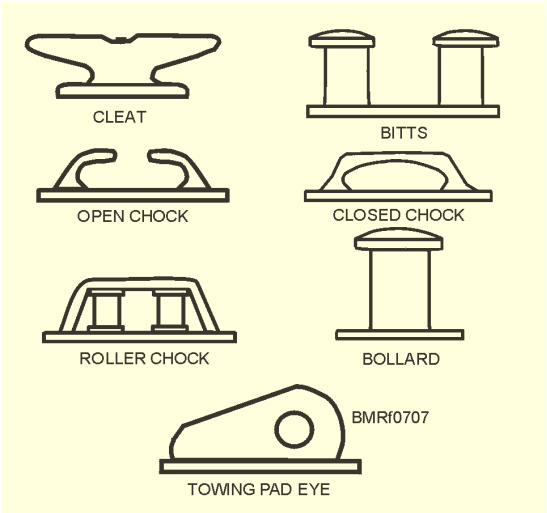

Figure 7-7.—Deck fittings.

DAVITS

Boats carried aboard ships usually are handled by powerful cranes and booms. These cranes and booms hook onto slings attached to hoisting points built into the strong parts of the boat's structure. Boats stowed at davits are lowered and hoisted by the davit machinery. Basically, a set of davits is nothing more than a special crane that is designed specifically for handling boats in a safe and timely manner.

BOAT BOOMS

Ships that are at anchor or moored to a buoy rig out their boat booms for the purpose of mooring their boats well clear of the side. This method of securing is known as *hauling out to the boom*. Forward booms are called *lower booms*; after booms are called *quarter booms*.

The boat boom shown in figure 7-8 is a spar that is secured to a gooseneck by a pin on the side of the ship. This arrangement allows free motion fore and aft. The outboard end of the boom hangs from a wire vang and tackle combination called the *topping lift*. Fore-and-aft motion is controlled by lines called *forward* and *after guys*.

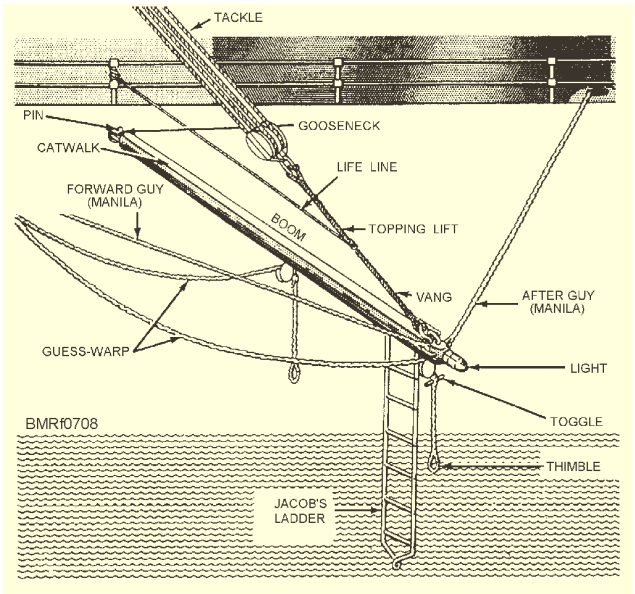

Figure 7-8.—Parts of a boat boom.

A strong line called a *guess-warp* runs from well forward on the ship out through a block or blocks on the boom and ends in a metal thimble through which boats can reeve (pass) their bowlines. A small piece of wood

Student Notes:

called a *toggle* is seized between strands of the guess-warp above the thimble to keep it from running up out of reach when a boat lets go. One or more *Jacob's ladders* (a rope ladder) from the boom permit boat crews to come aboard.

REVIEW 1 QUESTIONS

Q1. List six types of ground tackle used aboard ships.

a.

b.

c.

d.

e.

f.

Q2. Where are bower anchors located?

Q3. List the standard parts of the mooring line used to secure a normal sized ship at a pier.

a.

b.

c.

d.

e.

f.

Q4. Aboard ship, deck fittings are used for—

Q5. While anchored, what deck equipment is used to moor the ship's boat?

BOAT SEAMANSHIP

Learning Objectives: When you finish this chapter, you will be able to—

- Identify various types of boats, service craft, and combatant craft to include boat terms and nomenclature.
- Identify safety practices for boat passengers.

Boat seamanship is much more than a knowledge of the kinds of boats in operation in the Navy. Boat crews are responsible for the safe operation and upkeep of their craft and must receive training in a number of areas. Some of the techniques to be mastered require much practice and experience before a boat crew can become accomplished in their assigned duties. If you are assigned to duties as a member of a boat crew, you should study the *Seaman* and *Boatswain's Mate 3 & 2* training manuals and complete the required personnel qualification standards (PQS).

Boats used by the Navy are of three general groups—support craft, combatant craft, and boats in general. Each group may be determined by its assigned mission and by its type, design, and construction. Chapter 8 has detailed information about these craft.

BOATS

The term *boat* refers to a noncommissioned waterborne vessel that is not designated as a service craft. A boat is capable of limited independent operation. Officer/personnel boats, motor whaleboats, and utility boats fit into this group. Boats carried aboard ship that can be hoisted from and lowered into the water are known as *ship's boats*.

SERVICE CRAFT

The term *service craft* (figs. 7-9 and 7-10) is applied to waterborne craft that are designed for special use. Harbor tugs, ferryboats, various nonself-propelled barges, and floating dry docks are designated service craft.

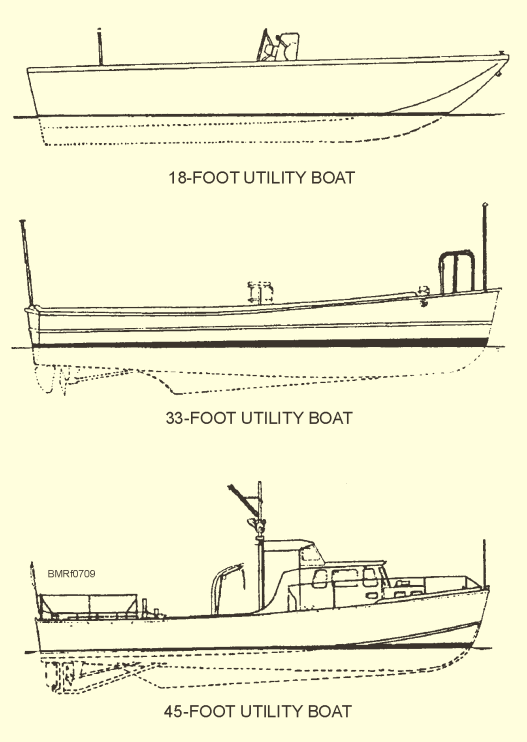

Figure 7-9.—Boats and service craft of the U.S. Navy.

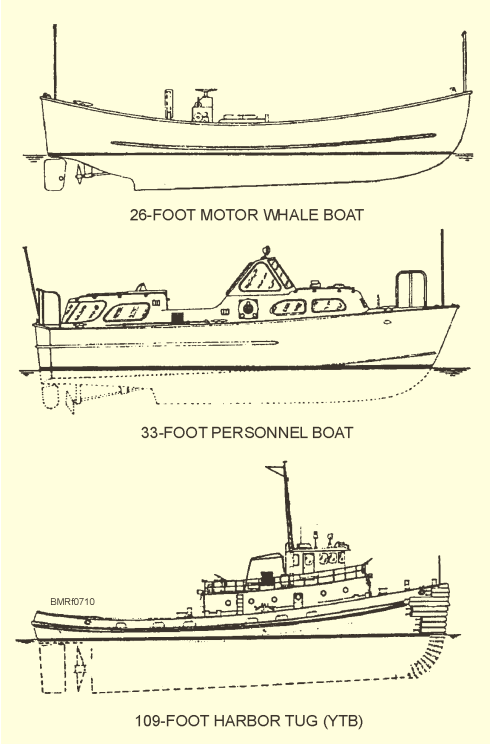

Figure 7-10.—Boats and service craft of the U.S. Navy (Continued).

COMBATANT CRAFT

Combatant craft are craft or boats specifically designed for combat roles. Figures 7-11 and 7-12 show a variety of patrol, riverine, amphibious warfare, and special combatant craft.

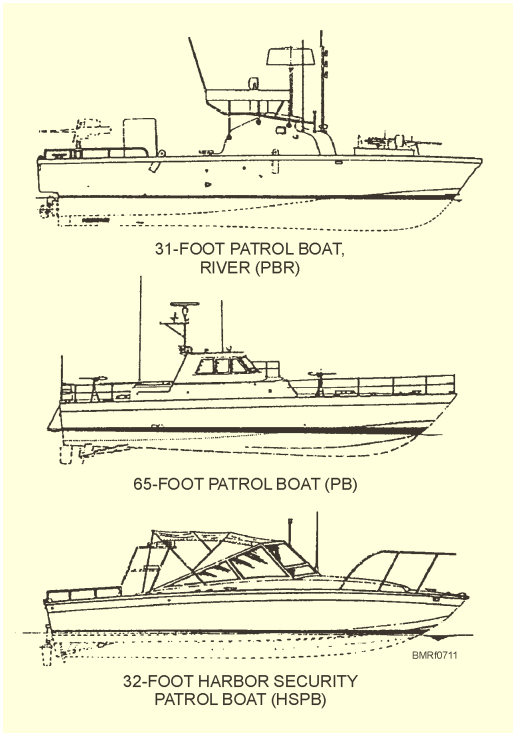

Figure 7-11.—Combatant craft of the U.S. Navy.

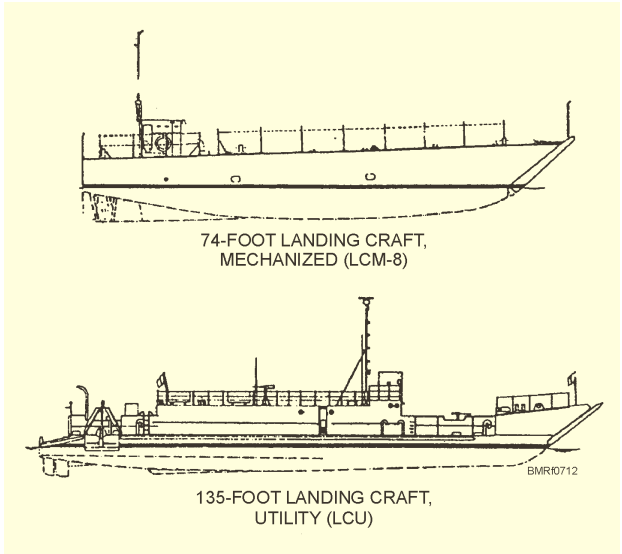

Figure 7-12.—Combatant craft of the U.S. Navy (Continued).

Student Notes:

BOAT SAFETY

Because the majority of Navy personnel are concerned with small boats only in the role of passengers, this section is written from the standpoint of passengers, rather than crew members. Every Sailor should be familiar with the following boat safety precautions:

- Obey all orders from the coxswain and boat officer.
- Embark in a quiet, orderly manner and move as far forward as possible. Once embarked, stay in place. Keep all parts of your body in the boat; do not perch on the gunwales.
- Don't engage in horseplay.
- Never needlessly distract the attention of crew members from their duties.
- Don't sit on life jackets—to do so mats the filler and reduces buoyancy.
- When told to do so, don your life jacket immediately.
- Don't smoke in a boat.
- During heavy weather, boat loads must be reduced.
- If told not to embark or requested to disembark, do so without argument
- If a boat swamps or capsizes, don't panic. Fear is transmitted easily from person to person, and a terrified individual drowns easily. Never strike out alone.
- Never strike out alone. Stay with the boat or huddle with other passengers because a large group can be found much more easily than individual swimmers.

BOAT TERMS AND NOMENCLATURE

Boat crew members often develop the habit of calling objects and the activities around them by their proper names. In times of emergency, your understanding and correct response to such terms could save valuable time.

Abaft. Any part of the boat aft of amidships.

After end (aft). The after end (aft) of a boat is the stern.

Amidships. Amidships is a point about halfway between the bow and stern and the sides of the boat.

Athwartships. When something is said to be *athwartships*, it's across the boat from side to side.

Forward end (fore). The forward end (fore) of the boat is the *bow.*

Inboard. Inboard usually describes the area inside the boat or an object nearer the centerline of the boat.

Outboard. Outboard describes the area furthermost from the boat's centerline or beyond the side of a boat.

Starboard. When facing forward of the boat, your right-hand side is the starboard.

Port. When you are facing forward of the boat, your left-hand side is the port.

Figure 7-13 shows a 26-foot personnel boat with features that are similar to most Navy boats.

By studying the nomenclature shown in figure 7-13, you will become familiar with much of the deck and hull equipment used on Navy boats. The glossary in appendix I of this training material will help you identify some of the terms.

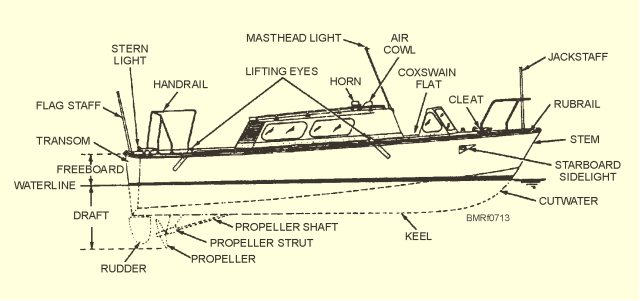

Figure 7-13.—Boat nomenclature.

Student Notes:

REVIEW 2 QUESTIONS

Q1. List two types of combatant craft .

a.

b.

Q2. As a boat passenger, you should obey the orders of what person(s)?

Q3. If a boat capsizes while you're a passenger, you shouldn't panic for what reason?

Q4. What does the term *athwartships* mean?

MARLINESPIKE SEAMANSHIP

Learning Objectives: When you finish this chapter, you will be able to—

- Identify the purpose of various types of line and rope.
- Recognize the procedures used to tie knots, bends and hitches, and to make splices.
- Identify the procedures for securing at sea.

Marlinespike seamanship is the art of handling and working all kinds of fiber and wire rope. *Rope* is a general term and can include both fiber and wire rope. In the Navy, Sailors generally refer to fiber rope as *line*, and wire rope is referred to as *rope, wire rope,* or *wire*. A better definition of a line is as follows: *A line is a length of rope, either fiber or wire, that is in use or has been cut for a specific purpose, such as a lifeline, heaving line, or lead line*. A few such lines have the word *rope* in their names, such as wheel rope, foot rope, and bell rope.

In sailing ships, the fiber ropes that gave athwartship support for the masts were so numerous that they actually shrouded the tops of the masts from the view of an observer on deck, hence, the name *shroud*. Stays, the fore and aft supports, were not so numerous, but there were several on each ship. Running rigging, tackles used to hoist and trim (adjust) the sails and handle cargo and other heavy weights, spanned the areas between sails, yards and decks, and yards and bulwarks. Lines secured the guns to the ship's sides and prevented them from rolling or recoiling across the gun decks. Gun tackles were used to haul the guns back into battery (firing position) after the guns were fired. Even the anchor cable was made of line. Obviously, line played a vital role in those ships.

In today's Navy, line isn't used as much as on sailing ships; however, it's still an important and expensive item. Therefore, every Sailor needs to learn the proper use and care of all kinds of line and wire rope. Today's Navy uses line made of fiber (natural and artificial); wire rope made of steel, phosphor bronze, and other metal; and a combination of wire and fiber (spring-lay).

Lines made from a variety of natural fibers have seen service in the Navy, but most have been replaced by lines made of synthetic fibers. The two most commonly used lines made of natural fibers are marline (tarred hemp fibers) and manila (abaca plant fibers). Manila line was formerly authorized for use only where great strength was required, such as mooring lines, towing lines, personnel transfers at sea and boatfalls. Fiber ropes made of tarred hemp are used in seizing, worming, serving ropes, and lashing. For most applications, nylon line (synthetic fiber) has replaced manila. Nylon line is about 2 1/2 times as strong as manila of the same size, has a greater strength and elasticity, and has a higher resistance to weather.

Wire rope usually is substituted for line where the line is subjected to a great deal of wear, weathering, or heat, and where greater strength is required. Spring lay is used for mooring lines, particularly at the bow and stern.

FIBER LINE

Any rope that is not wire is fiber rope. Except in a few instances where it has special uses, **fiber rope is never called anything but line aboard ship**.

Student Notes:

Lines are classified by both their construction and their material. Nearly all line used in the Navy is three-strand line.

Line is made by twisting fibers into threads (or yarns), threads into strands, and strands into rope. Taking the process further, ropes twisted together form a cable—an item seldom seen nowadays. Most of our lines are three-strand and right-laid; that is, as you look along a line, the twist is to the right. During construction of natural fiber line, a lubricant is added that also serves as a preservative.

Large line is measured by circumference. Line 1 3/4 inches and under in circumference, called *small stuff*, is identified by the number of threads in the line. A line with twenty-four thread is 1 1/2 inches in circumference. Inasmuch as the numbers of threads per strand are equal, thread numbers in a three-strand line are divisible by 3—24, 21, 18, and so on, down to the smallest—6 thread (3/4 inch). Line from 1 3/4 inches to about 4 inches is manufactured in 1/4-inch graduations. The length of all line and wire rope is usually measured in feet.

The chart shown below lists tips on the care of natural fiber line. You should be thoroughly familiar with them and observe them at all times.

NEVER	ALWAYS
Stow wet or damp line in an unventilated compartment or cover it so that it cannot dry. Mildew will form and weaken the fibers.	Dry line before stowing it.
Subject line to intense heat nor unnecessarily allow it to lie in the hot sun. The lubricant (natural oils) will dry out, thus shortening the useful life of the line.	Protect line from weather when possible.
Subject a line to loads exceeding its safe working load. To do so may not break the line, but individual fibers will break, reducing the strength.	Use chafing gear (canvas, short lengths of old firehose, and so on) where line (or wire) runs over sharp edges or rough surfaces.
Allow line to bear on sharp edges or run over rough surfaces. The line will be cut or worn, reducing the strength and useful life.	Slack off taut lines when it rains. Wet line shrinks, and if the line is taut, the resulting strain may be enough to break some of the fibers.
Scrub line. The lubricant will be washed away, and caustics in strong soap may harm the fibers.	Coil right-laid line to the right (clockwise).
Put a strain on a line with a kink in it.	Inspect a line before using it. Overworked or overstrained line will have a bristly surface. Mildew can be seen, and it has peculiar, unpleasant odor. Untwist the line so that the inner parts of the strands can be seen. If they have a dull, grayish look, the line is unsafe.
Try to lubricate line. The lubricant you add may do more harm than good.	Give line the care it deserves—someday your safety may depend on it.

Student Notes:

NYLON LINE

Most of the tips for the care of natural fiber line should be observed with nylon line. Nylon, however, is not subject to mildew. It should be scrubbed if it becomes slippery because of oil or grease.

A stretch of one third of its length is normal for nylon line under safe working loads. Nylon stretches about 50 percent before it will break. Because of its elasticity, nylon line breaks with a decided snapback; therefore, stand well clear when it is under a heavy strain.

CAUTION

Snapback is extremely dangerous and has caused severe injuries and death. The utmost caution must be observed when working with or around all synthetic lines.

WIRE ROPE

The basic unit of wire rope construction is the individual wire, which is made of steel or other metal and comes in various sizes. These wires are laid together to form strands. The number of wires in a strand varies according to the purpose of the rope. A number of strands are laid together to form the wire rope itself.

Wire rope is designated by the number of strands per rope and the number of wires per strand. For example, a 6 by 19 rope will have 6 strands with 19 wires per strand. It may have the same outside diameter as a 6 by 37 wire rope, which will have 6 strands with 37 wires of much smaller size per strand. The more wires per strand, the more flexible the rope. Rope with fewer and larger wires per strand is more resistant to external abrasion.

The strands of the wire rope are laid up around a central core, which may be only a single wire, a single strand of wire, or hemp. A hemp core contributes flexibility, cushions the strands as the wire rope contracts under strain, and holds a portion of lubricant for continuous lubrication. A wire core is stronger than hemp and can be used where conditions, such as high temperatures, would damage a hemp core.

WHIPPINGS

Whippings are bindings on the ends of rope that keep the rope from unlaying. On line, whippings are made with cord, such as sail twine or with marline. The ends of all line must be whipped because of the frequent need for passing the ends through rings and pad eyes and for reeving them through blocks. Unlaid and frayed ends of line are unsightly and unseamanlike and waste many feet of line. Knots or backsplices in the end of a line are not allowed, nor are friction tape or wire whippings. Knots and backsplices will jam in a block; friction tape will not hold for long; and wire may tear a line-handler's hands.

The most secure whipping is made with the aid of a sail needle and palm. However, an excellent whipping can be made without a needle if the procedure shown in figure 7-14 is followed. First, lay one end of the whipping along the line, bind it down with a couple of turns, and snug up the edges. Then lay the other end on in an opposite direction with the body portion of the whipping, continuing with several more turns from the bight of the whipping. The whipping length should be about equal to the diameter of the line being whipped. Snug up the edges and cut off the twine close to the line. This type of whipping is a temporary one. If the line is to be used frequently, a permanent whipping should be used.

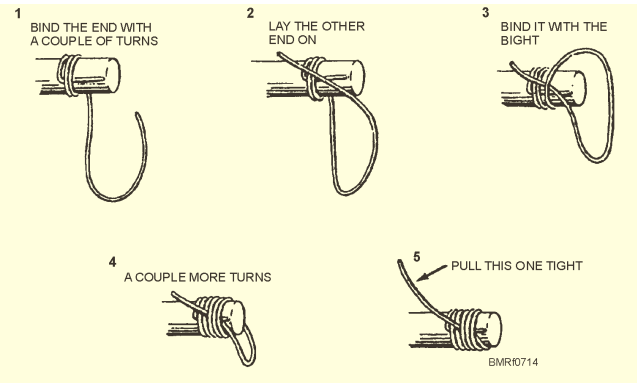

Figure 7-14.—Plain whipping a line.

Student Notes:

KNOTS, BENDS, AND HITCHES

Except among seamen, the word *knot* is ordinarily used as an all-inclusive term, covering the more specific use of knots plus bends and hitches. Even seamen find it hard to clearly define the terms *knot*, *bend*, and *hitch* because their functions overlap like the bowline knot and many other instances. In general, however, the terms may be defined as follows:

Knots. Knots are used to form eyes or to secure a cord or line around an object, such as a package. In other words, the line is bent to itself.

Hitches. Hitches are used to bend a line to or around an object, such as a ring, spar, or stanchion.

Bends. Bends are used to secure two lines together.

All Navy personnel should know the square knot, bowline, single- and double-becket bends, round turn and two half hitches, and clove hitch. Navy personnel should know when these knots, bends, and hitches are used. Before reading further, look at figure 7-15, which shows a few terms that make it easier for you to understand the following procedures.

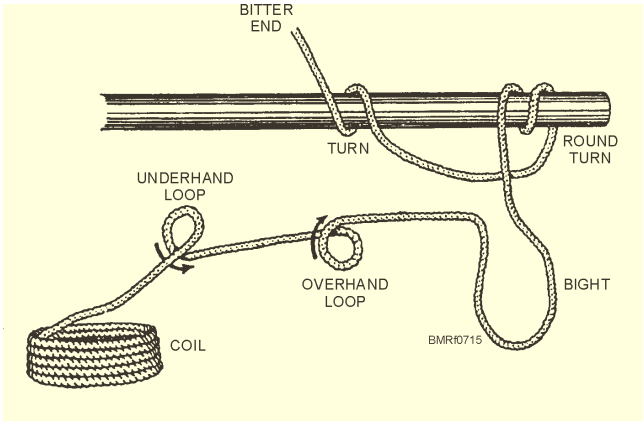

Figure 7-15.—Elements of knots, bends, and hitches.

Square Knot

The square knot, also known as the *reef knot* from its use in reefing sails, is quickly and easily made and has a great many uses. It will not slip, but it can jam under heavy strain. It can be loosened, however, by pulling on first one and then the other end. Figure 7-16 shows steps in making a square knot.

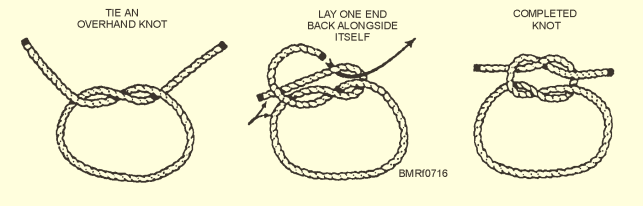

Figure 7-16.—Square knot.

Bowline

The bowline, with its many variations, has a lot of uses. Its chief use is to form an eye; but it can also be used to secure a line to a pad eye, to secure another ring around a stanchion or other object, or to bend two lines together.

To tie a bowline, you should—

1. Grasp the bitter end of the line in the right hand and the standing part in the left hand (opposite, if left-handed). Assuming you are using small stuff, the length of line between your hands should be about 2 feet.
2. Throw an overhand loop counterclockwise near your left hand (clockwise near your right hand, if you are left-handed).
3. Grasp the loop formed and hold it. Pass the bitter end up through the bottom of the loop, as shown in figure 7-17, view A.
4. Pull the bitter end up through the loop, and pass it around behind the standing part of the line (fig. 7-17, view B).
5. Pass the bitter end down through the loop beside the line that was pulled up through the loop (fig. 7-17, view C).
6. To tighten the knot, grasp the standing part in one hand and the two lines passed through the loop with the other hand, and pull.

Student Notes:

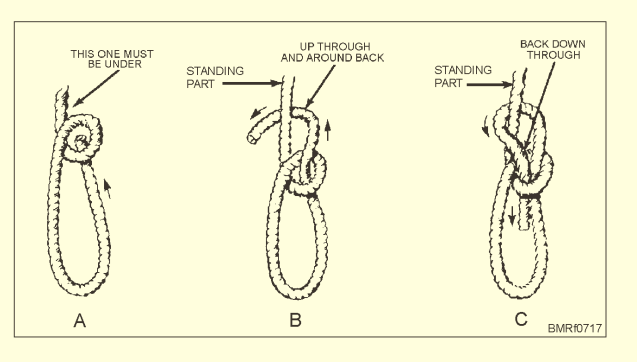

Figure 7-17.—Tying a bowline.

Becket Bend

The chief value of the becket bend is its use in binding together two lines of different sizes. If there is a great difference in sizes or the strain on the line is to be great, always use a double becket bend.

To fashion a single becket bend, you should—

1. Make a bight in one line and run the bitter end of the other line up through it, as shown in figure 7-18, view A.
2. Pass the end around behind both parts of the bight and back under itself (fig. 7-18, view B).

Figure 7-18, view C, shows how you make a double becket bend by simply taking another turn around the bight. (These bends are also known as *sheet bends*.)

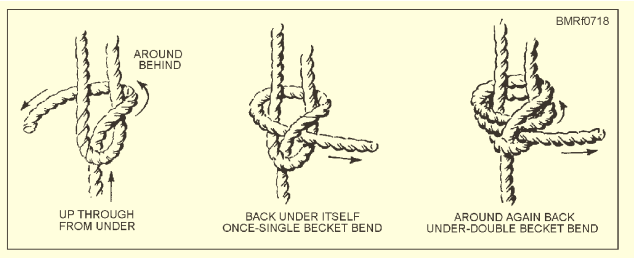

Figure 7-18.—Single- and double-becket bends.

Clove Hitch

The clove hitch can be quickly and easily tied in several ways, and it will hold as long as there is a strain on it. Once the strain is taken off, however, the hitch must be checked and tightened to prevent the bitter end from pulling out when the strain is reapplied. To make this checking and tightening unnecessary, you lash a clove hitch with a half hitch around the standing part.

To tie this hitch (fig. 7-19), you should—

1. Take a turn with the bitter end.
2. Pass the end across the standing part.
3. Take another turn. (Notice that both turns go around in the same direction.)
4. Pass the end under itself, and the hitch is complete.

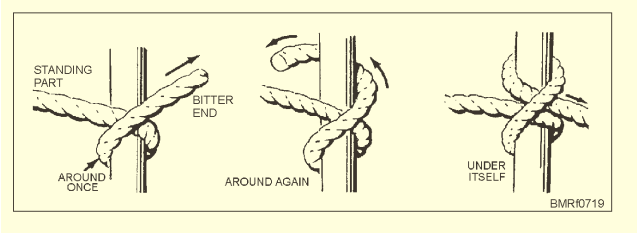

Figure 7-19.—Tying a clove hitch.

Another way to make this hitch is to form two underhand loops. Lay the second loop on top of the first. This method is the usual way to form the hitch when it can be slipped over the end of the object to which the line is to be secured.

Round Turn and Two Half Hitches

The chief advantage of the round turn and two half hitches over other hitches is that it won't slip along the object to which it is secured. It's made by taking a round turn and making two half hitches (fig. 7-20). (The two half hitches actually consist of a clove hitch taken around the line itself.)

Student Notes:

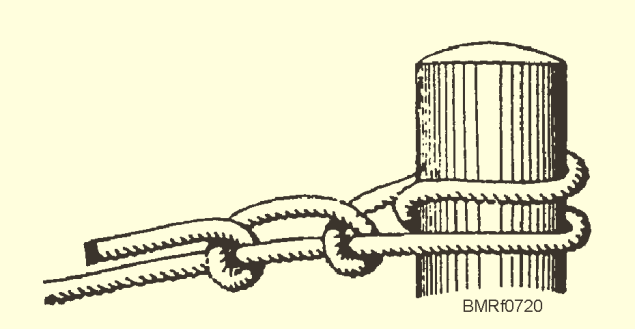

Figure 7-20.—Round turn and two half hitches.

Making Up a Line

Once line is removed from the manufacturer's coil, or spool, it may be made up (for ready use) by coiling down, faking down, or flemishing. Figure 7-21 shows the methods of coiling, faking, and flemishing lines.

"Coiling down a line" means laying it up in circles, roughly one on top of the other. Faking down a line is laying it up in the same manner as for coiling down, except that it is laid out in long, flat bights, one alongside the other, instead of in round coils. The main advantage of working with line that is faked down is that it runs off more easily. To flemish down a line, start with the bitter end, and lay on deck successive circles of line in the manner of a clock spring with the bitter end in the center. Right-laid line is laid down clockwise; left-laid line is laid down counterclockwise.

SPLICES

Splices are used to permanently join two lines or to form an eye or loop in the end of a line. When time permits, splices should be used instead of knots because splices are much stronger.

Eye Splice

To make an eye splice, unlay (untwist) the strands in the end of your line about 8 to 10 turns of lay. Whip the end of each strand to prevent the strands from unlaying while you splice.

NOTE

When splicing synthetic line, such as nylon, it is sometimes easier to use tape on the strand ends. Large line, such as mooring lines, should be seized or bound together at the point where unlaying stops.

To form the eye, bend the line back until the eye is the desired size. This is the point where your splicing begins.

Follow the steps shown in figure 7-22 by tucking each whipped strand under one strand of the line. Pull the slack out of each tuck and check the size of the eye. (If a thimble is to be used, insert it at this point.) Follow the "over one strand, under the next" procedure until you complete at least three tucks for natural fiber line or four tucks for synthetic line. (**NOTE:** The splice can be smoothed by rolling it on deck under your foot.)

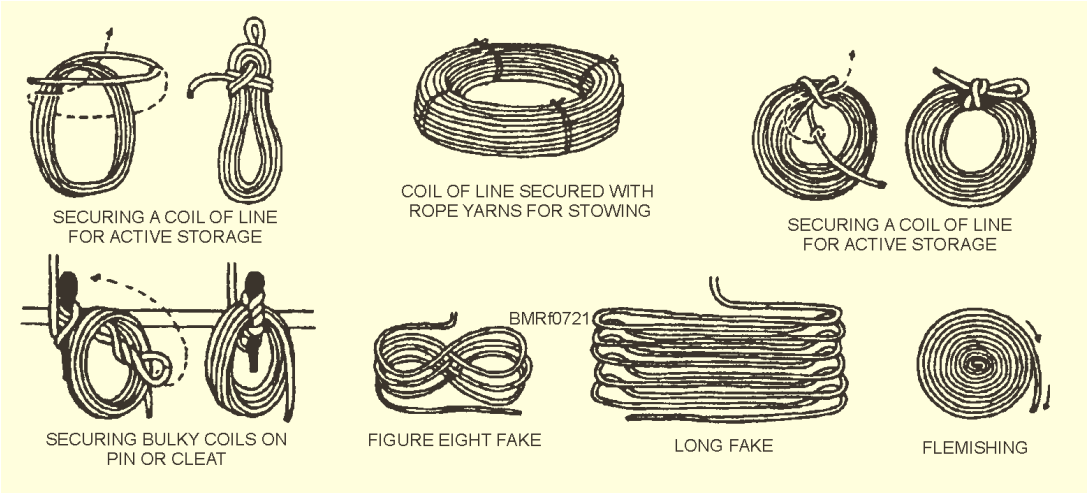

Figure 7-21.—Coils, fakes, and flemishes.

Student Notes:

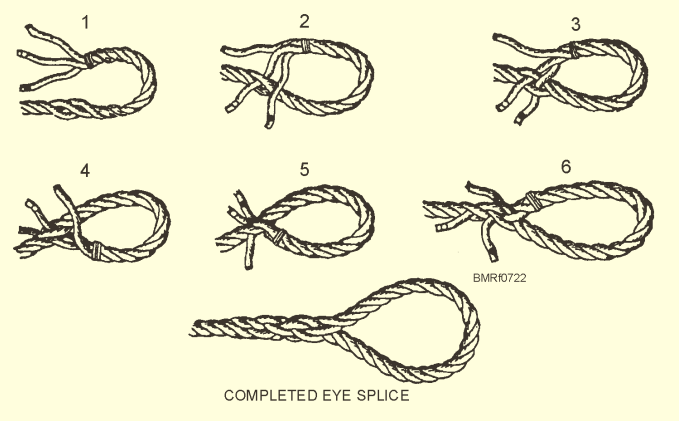

Figure 7-22.—Steps for making an eye splice.

Upon completion of the splice, the excess length of each strand must be cut off. When natural fiber line is used for the splice, the strands can simply be cut off near the line. With synthetic line, a short length of each strand should be left intact. The ends of the threads of each strand are then melted together over an open flame to prevent the strands from frazzling.

When you melt the ends of the strands, don't allow any of the melted synthetic line to drip on you, your clothing, another person, or anything that might present a fire hazard. Also, observe all safety precautions pertaining to the use of open flames aboard your ship or station.

Short Splice

A short splice is used where two lines are to be permanently joined, provided a slight enlargement of the diameter is not important. When properly made, the short splice is much stronger than any knot.

After unlaying and whipping the strands as described for the eye splice, seize each line where the unlaying stops. Now butt the two lines together so that they are interlaced, and follow the steps shown in figure 7-23.

With large lines, you must put on a temporary seizing where they join to keep them from suddenly coming apart. It's better to do that with small lines, too, until you get the hang of holding them together while you tuck.

Once your seizing is on, tuck over and under the same way you finish off an eye splice. Three tucks (natural fiber) or four tucks (synthetic fiber) on each side of the seizing are ample. Remove the seizing, cut off the ends of the strands, and melt them (if appropriate) as previously described.

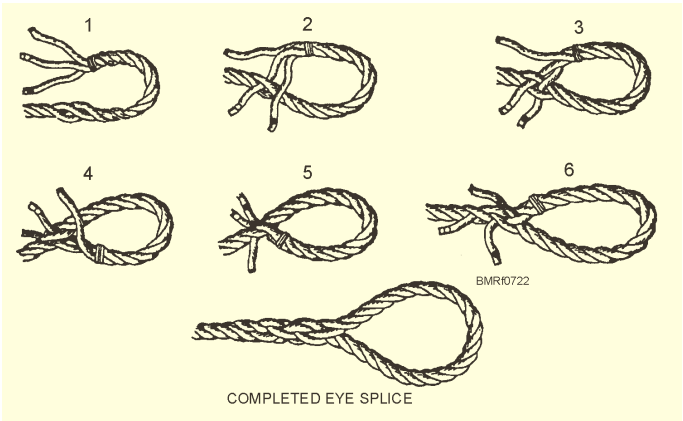

Figure 7-22.—Steps for making an eye splice.

Student Notes:

SECURING FOR SEA

You are required to learn these knots, bends, and hitches so that you can use them when and where necessary. Rest assured that a person who goes to sea will find frequent use for them in securing equipment to prevent damage from rough waters. How the equipment is secured depends on the gear and the places of stowage. By observing the few tips that follow and by using a little common sense, you should be able to do a good job of securing your equipment for sea.

- Use line strong enough to hold the gear.
- Make certain the line is in good condition. Make fast the belay objects from at least two points that, preferably, are near the object.
- Lash tightly all objects against something solid (such as the bulkhead).
- Make the lashings taut so that the object will not "work" with the pitch and roll of the ship. Frequently check all lashings, and tighten as necessary.
- Use chafing gears on sharp corners and rough surfaces.
- Never make fast your lashings to electric cables or small slightly secured pipes, lagged pipes, door and hatch dogs or hinges, electric motors, lifeline stanchions, or anything not solidly secured.
- Never block access to vents, fireplugs, switches, valves, doors, or hatches.

Never underestimate the force of the sea! Secure everything properly the first time and be safe.

REVIEW 3 QUESTIONS

Q1. List the three advantages of using nylon line over natural fiber line.

a.

b.

c.

Q2. When a natural fiber line will bear on sharp edges or run over rough surfaces, what action should you take to protect the line from damage?

Q3. Under what condition should you use a wire rope?

Q4. You are right-handed. When tying a bowline, the overhand loop should be in what direction?

Q5. You are going to join two separate lines together using a becket bend. What is the first step you should take?

SUMMARY

Becoming an accomplished seaman takes time, hard work, and patience. At some time in your career, you could be a member of a detail where handling lines will be required, or you may work with deck equipment and lines on a daily basis. Knowing how to use deck equipment and handle lines safely is essential.

Lines are used in the Navy for many reasons—from mooring aircraft carriers to securing bookshelves at sea. Without the wide variety of lines available to us, our way of doing our jobs would be extremely difficult.

Each piece of deck equipment or fitting has been designed for a specific purpose. A set of bits on a destroyer is used primarily for mooring, where a set of bits on a tug is used almost exclusively for towing. Becoming familiar with deck equipment and its use, and knowing how to makeup and use lines is not only a sign of good seamanship but could, in case of emergencies, make the difference between saving or losing the ship or your shipmates.

Each person in the Navy is first and foremost a seaman and then a technician in his or her specific rate. Become proficient in seamanship. It may help you in your daily duties and most certainly assist you in times of difficulty.

Student Notes:

REVIEW 1 ANSWERS

A1. Ground tackle used on board ship includes—

a. **Anchors**

b. **Anchor cable and chains**

c. **Chain stoppers**

d. **Bending shackles**

e. **Outboard swivel shots**

f. **Detachable links**

A2. Bower anchors are **carried on the bow of a ship and secured in the hawspipe**.

A3. The standard mooring lines used to secure a normal size ship at a pier include the—

a. **Bowline**

b. **Forward bow spring**

c. **After bow spring**

d. **Forward quarter spring**

e. **After quarter spring**

f. **Stern line**

A4. Aboard ship, deck fittings are used **in securing mooring lines, in towing operations, and in securing heavy objects and equipment**.

A5. **Boat booms** are used to moor the ship's boat while anchored.

REVIEW 2 ANSWERS

A1. Combatant craft include—

a. **Mechanized landing craft (LCM)**

b. **Utility landing craft (LCU)**

A2. As a passenger, you should **obey all orders from the boat officer and the coxswain**.

A3. If a boat you're a passenger in capsizes, you shouldn't panic because **fear is easily transmitted from one person to another**.

A4. The term *athwartships* refers **to the position of something that is across the boat from side to side at a right angle.**

REVIEW 3 ANSWERS

A1. Three advantages of using nylon line over natural fiber line include—

a. **Nylon line is 2 1/2 times stronger than natural fiber**.

b. **Nylon has greater strength and elasticity**.

c. **Nylon has greater resistance to weather**.

A2. To protect a natural fiber line from sharp edges and rough surfaces, you should **use a chafing gear between the contact point of the line and the damaging surface**.

A3. You should use a wire rope **when a great deal of wear and tear and weathering and heat is met, and greater strength is needed**.

A4. The overhand loop should be turned in a **counterclockwise direction**.

A5. The first step you should take when joining two separate lines together using a beck bend is to **make a bight on one line and run the bitter end of the other line up through the bight**.

Student Notes:

ASSIGNMENT 4

Textbook Assignment: Chapter 6 "*Naval Organization*" and chapter 7 "*Basic Seamanship*."

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1. Which of the following is NOT a DoD military department?
    1. Army
    2. Coast Guard
    3. Navy
    4. Air Force
2. By law, what person heads the Department of the Navy (DoN)?
    1. Secretary of Defense
    2. Joint Chief of Staff
    3. Secretary of the Navy
3. Title 10 of the U.S. Code states that which of the following actions is/are part of the Navy's mission?
    1. Oversee construction, outfitting, and repair of naval ships, equipment, and facilities
    2. Station troops in forward positions
    3. Commands U.S. forces in CONUS
    4. Commander and chief of all sea commands
4. What are the three principal components of the DoN?
    1. The Navy Department executive offices, the operating forces including the Marine Corps, and the Shore Establishment
    2. The Navy Department executive offices, the operating forces excluding the Marine Corps, and the Shore Establishment
    3. The Navy Department excluding the executive offices, the operating forces excluding the Marine Corps, and the Shore Establishment
    4. The Navy Department excluding the executive offices, the operating forces including the Marine Corps, and the fleet commands
5. The operating forces are under the command of the
    1. Secretary of Defense
    2. Secretary of the Navy
    3. Chief of Naval Operations
    4. Chief of Naval Personnel
6. What is the purpose of the Shore Establishment?
    1. A last line of defense
    2. To provide support to the operating forces
    3. To provide a supply line
    4. To support the front line
7. Aboard ship, what publication contains information about the ship's organization?
    1. *Standard Organization and Regulations of the U.S. Navy* only
    2. *Shipboard Organization and Regulations Manual* only
    3. *Standard Organization and Regulations of the U.S. Navy and Shipboard Organization and Regulations Manual*
    4. *Uniform Code of Military Justice*
8. A ready source of information about the duties, responsibilities, and authority of personnel assigned to a ship is stated in which of the following documents?
    1. *United States Navy Regulations*
    2. Watch, Quarter, and Station Bill
    3. *Standard Organization and Regulations Manual*
    4. *Ship's Organization and Regulations Manual*
9. What are the two elements of a ship's organization?
    1. Battle organization and damage control organization
    2. Battle organization and administrative organization
    3. Administrative organization and training organization
    4. Administrative organization and damage control organization
10. Each ship is organized into what minimum number of departments?
    1. Five
    2. Two
    3. Three
    4. Four

11. Which of the following is a responsibility of the operations department?

    1. Piloting the ship
    2. Forecasting weather
    3. Conducting and analyzing intelligence information
    4. Both 2 and 3 above

12. The damage control assistant is a member of what department on a ship?

    1. Deck
    2. Supply
    3. Operations
    4. Engineering

13. If a ship doesn't have a deck department, what department is responsible for inspection and maintenance of survival equipment?

    1. Supply
    2. Weapons
    3. Navigation
    4. Engineering

14. Which of the following officers is ultimately responsible for the safe navigation of the ship?

    1. Navigator
    2. Operations officer
    3. Executive officer
    4. Commanding officer

15. When a ship is abandoned, custom and regulation require which of the following actions by the commanding officer?

    1. To be the first person to leave the ship
    2. To be the last person to leave the ship
    3. To exert every effort to destroy the ship before it sinks
    4. To inform all personnel that they are on their own

16. What is the function of the command master chief?

    1. To take charge of and be responsible for the training of enlisted personnel
    2. To assign enlisted personnel to their duties according to their qualification
    3. To relieve the commanding officer of the responsibility for the welfare and morale of enlisted personnel
    4. To transmit ideas and recommendations directly to the commanding officer

17. Of the following duties, which is NOT one of the executive officer's?

    1. Assignment of personnel
    2. Coordination of ship's drills
    3. Assignment of punishment to offenders
    4. Coordination of policing and inspection of the ship

18. If the executive officer becomes incapacitated, what person normally takes over his/her duties?

    1. The next senior line officer assigned to the ship
    2. An officer appointed by the ship's captain
    3. The next senior staff officer on board
    4. The first lieutenant

19. For what reason do commanding officers and executive officers usually have separate battle stations aboard ship?

    1. To decrease the likelihood of their being disabled at the same time
    2. To maintain a high degree of control over personnel
    3. To provide maximum coordination of operations throughout the ship
    4. To divide the areas of responsibility between the executive officer and the commanding officer

20. The department head is responsible for which of the following functions within a department?

    1. General condition of equipment
    2. Administrative matters
    3. Operational readiness of the department
    4. All of the above

21. The division officer has the responsibility of carrying out which of the following duties?

    1. Making frequent inspections of division spaces, equipment, personnel, and supplies
    2. Maintaining copies of division orders and bills and displaying them conspicuously
    3. Training division personnel and preparing them for battle
    4. Each of the above

22. Most of the jobs that are done by the XO's assistants aboard ship are the responsibility of what department in an aircraft squadron?

    1. Administrative department
    2. Maintenance department
    3. Operations department
    4. Safety department

23. Which of the following is a responsibility of the operations department of an aircraft squadron?

    1. Overall maintenance of the ship's aircraft
    2. Operational readiness and tactical efficiency
    3. Squadron safety program
    4. All of the above

24. Which of the following is the definition of the term *job accountability*?

    1. Taking command under duress
    2. Accepting credit for your job
    3. Answering to seniors in the chain of command for the way you do your job
    4. Answering only for personal mistakes

25. What is meant by *effective communications* in the chain of command?

    1. The ability to speak clearly
    2. The use of proper terminology
    3. The proper use of reports, messages, and other types of correspondence
    4. The action of seniors informing juniors about matters that affect the juniors, and the action of juniors informing seniors of existing problems

26. You need help in solving a work-related problem. Which of the following personnel should contact first?

    1. Your supervisor
    2. Your department head
    3. Your division officer
    4. Your executive officer

A. DECK SEAMANSHIP

B. BOAT SEAMANSHIP

C. MARLINESPIKE SEAMANSHIP

Figure A

IN ANSWERING QUESTIONS 27 THROUGH 30, REFER TO FIGURE A AND SELECT THE TERM USED TO DEFINE THE QUESTION.

27. General boat handling.

    1. A
    2. B
    3. C

28. The general work on the ship's deck and the equipment used.

    1. A
    2. B
    3. C

29. Anchoring, mooring, cargo handling, and towing are examples of this type of seamanship.

    1. A
    2. B
    3. C

30. Care and use of line.

    1. A
    2. B
    3. C

31 It is important for you to know shipboard equipment terminology for which of the following reasons?

    1. Equipment changes all the time
    2. You will have to inventory the equipment once each month
    3. You will probably assist the deck force in various seamanship evolutions
    4. There are different names for the same equipment

32. What is ground tackle?

    1. Equipment bolted to the deck
    2. Equipment used to anchor and moor with anchors
    3. Equipment electrically connected to ground
    4. Equipment used to refuel the ship

33. Which of the following is/are the most commonly used anchors aboard Navy ships?

    1. Lightweight
    2. Stockless
    3. Both 1 and 2 above
    4. Locking pin

34. How long is a standard shot of anchor chain?

    1. 15 fathoms
    2. 20 fathoms
    3. 25 fathoms
    4. 30 fathoms

35. What device is used to secure shots of anchor chain together?

    1. Link pins
    2. Bending shackles
    3. Detachable links
    4. Securing shackles

36. What types of anchor windlasses are used for lifting the ship's anchor?

    1. Vertical shaft type only
    2. Horizontal shaft type only
    3. Vertical shaft and horizontal shaft types
    4. Lateral shaft type

37. What device engages the chain links when hauling anchors on board ship?

    1. Wildcat
    2. Capstan
    3. Gypsy heads
    4. Bending shackles

38. Which of the following platforms is/are used in the construction of an accommodation ladder?

    1. Middle platform
    2. Upper platform
    3. Lower platform
    4. Both 2 and 3 above

39. What is the Navy term for gangplank?

    1. Brow
    2. Ramp
    3. Platform
    4. Accommodation ladder

40. What lines are used to prevent the ship from drifting forward or aft?

    1. The bowline and the forward spring lines
    2. The stern line and after spring lines
    3. The forward and after spring lines
    4. The bow and stern lines

41. What means are used to protect the sides of a ship when it is alongside a pier?

    1. Doubled lines
    2. Camels only
    3. Fenders only
    4. Camels and fenders

42. What is the main purpose for deck fittings aboard ship?

    1. To secure mooring lines
    2. To connect electrical power
    3. To replace stanchions
    4. To secure the anchor

43. Which of the following is NOT a deck fitting found aboard ships?

    1. Bitts
    2. Cleats
    3. Bollards
    4. Pad eyes

44. Which of the following is the purpose of boat booms when ships are at anchor or moored to a buoy?

    1. To raise and lower supplies
    2. To moor their boats well clear of the side
    3. Both 1 and 2 above
    4. To raise and lower personnel

45. Which of the following is/are types of boats used by the Navy?

    1. Service craft
    2. Combatant craft
    3. Boats in general
    4. All of the above

46. A boat is defined as a non-commissioned waterborne vessel that isn't designated as a service craft. According to this definition, which of the following are types of boats?

    1. Personnel boats
    2. Motor whaleboats
    3. Utility boats
    4. All of the above

47. Which of the following is a type of service craft?

    1. Riverine craft
    2. Patrol craft
    3. Ship's boats
    4. Harbor tugs

48. Which of the following is a type of combatant craft?

    1. Patrol craft
    2. Ship's boats
    3. Ferryboats

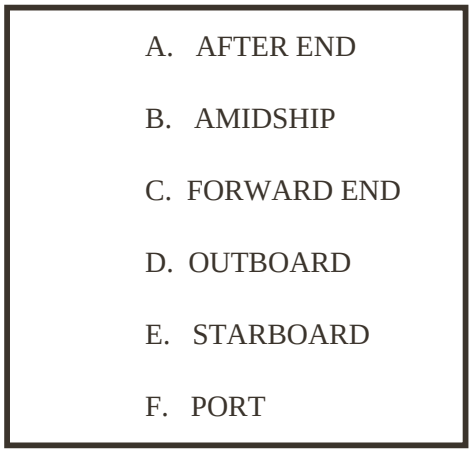

Figure B

IN ANSWERING QUESTIONS 49 THROUGH 53, REFER TO FIGURE B AND SELECT THE TERM DESCRIBED BY THE QUESTION.

49. When facing forward of the boat, your right-hand side is in this direction.

    1. C
    2. D
    3. E
    4. F

50. The stern of the boat.

    1. A
    2. B
    3. C
    4. D

51. The area furthermost from the boat's centerline.

    1. B
    2. C
    3. D
    4. E

52. When facing forward of the boat, your left-hand side is facing this direction.

    1. A
    2. B
    3. E
    4. F

53. The bow of the boat.

    1. B
    2. C
    3. D
    4. F

54. Nylon line is about how many times stronger than manila line of the same size?

    1. 1 1/2
    2. 2 1/2
    3. 3 1/2
    4. 4 1/2

54. How is line termed *small stuff* identified?

    1. By the length of the line
    2. By the number of threads in the line
    3. By the number of strands in the line
    4. By the number of cables twisted together

56. Under safe working conditions, nylon line will stretch what maximum fraction of its length?

    1. 1/4
    2. 1/3
    3. 1/2
    4. 2/3

57. Nylon line will stretch what maximum percentage of its length before it will break?

    1. 20%
    2. 33%
    3. 50%
    4. 66%

58. A wire rope designated as 5 by 12 has (a) what number of strands and (b) what number of wires per strand?

    1. (a) 5 (b) 12
    2. (a) 12 (b) 12
    3. (a) 12 (b) 5
    4. (a) 5 (b) 5

59. The most secure line whipping is made with which of the following pieces of equipment?

    1. Small needle and palm
    2. Wire cutters
    3. Hammer
    4. Pliers

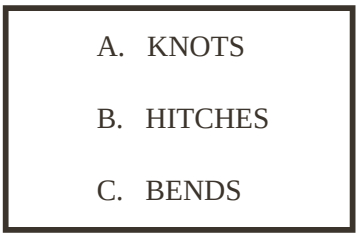

Figure C

IN ANSWERING QUESTIONS 60 AND 61, REFER TO FIGURE C AND SELECT THE TERM DESCRIBED BY THE QUESTION.

60. Used to bend a line to or around an object.

    1. A
    2. B
    3. C

61. Used to form eyes or to secure a cord or line around an object.

    1. A
    2. B
    3. C

62. The square knot is also known as a

    1. granny knot
    2. seaman's knot
    3. reef knot
    4. top knot

63. The bowline can be used for which of the following purposes?

    1. To form an eye
    2. To bend two lines together
    3. To secure a line to a pad eye
    4. Each of the above

64. The main value of the becket bend is that it can be used to bend together two lines of different sizes.

    1. True
    2. False

65. If there is a great strain on a line, what type of bend should be used?

    1. Becket bend
    2. Double becket bend
    3. Bowline
    4. Double bowline

66. What type of hitch will hold as long as there's a strain on it?

    1. Two half hitches
    2. Two underhanded loops
    3. Round and turn and two half hitches
    4. Clove hitch

67. Which of the following actions would you perform to "coil down" a line?

    1. Lay line in successive circles with the bitter end in the center
    2. Lay line in circles, one on top of the other
    3. Lay line in long, flat bights
    4. Lay line out in full

68. Which of the following actions would you take to "flemish down" a line?

    1. Lay line in successive circles with the bitter end in the center
    2. Lay line in circles, one on top of the other
    3. Lay line in long, flat bights
    4. Lay line out in full

69. When making an eye splice, you should unlay what number of line strands?

    1. 2 to 4
    2. 4 to 6
    3. 6 to 8
    4. 8 to 10

70. Which of the following procedures is used to prevent the strands of synthetic line from frazzling after a splice has been made?

    1. They are whipped
    2. They are melted together
    3. They are cut off even with the standing part
    4. Each of the above

71. Which of the following is the purpose of using a short splice?

    1. To temporarily join two lines together
    2. To permanently join two lines together
    3. To form an eye
    4. Each of the above