Although the words “he,” “him,” and “his” are used sparingly in this course to enhance communication, they are not intended to be gender driven or to affront or discriminate against anyone.
PREFACE

By enrolling in this self-study course, you have demonstrated a desire to improve yourself and the Navy. Remember, however, this self-study course is only one part of the total Navy training program. Practical experience, schools, selected reading, and your desire to succeed are also necessary to successfully round out a fully meaningful training program.

COURSE OVERVIEW: In completing this nonresident training course, you should be able to: Identify the primary reports and periodicals of importance to the Electronics Technician Second Class; Identify and briefly describe the primary components of and forms associated with the Maintenance Data System (MDS); Identify the primary publications that an Electronics Technician should expect to find in the ET technical library; Identify and briefly describe the major components of the Naval Supply Systems Command; Identify the major parts of the Coordinated Shipboard Allowance List (COSAL); Explain the basic procedures involved in the requisition and turn in of supplies and equipment in the naval supply systems.

THE COURSE: This self-study course is organized into subject matter areas, each containing learning objectives to help you determine what you should learn along with text and illustrations to help you understand the information. The subject matter reflects day-to-day requirements and experiences of personnel in the rating or skill area. It also reflects guidance provided by Enlisted Community Managers (ECMs) and other senior personnel, technical references, instructions, etc., and either the occupational or naval standards, which are listed in the Manual of Navy Enlisted Manpower Personnel Classifications and Occupational Standards, NAVPERS 18068.

THE QUESTIONS: The questions that appear in this course are designed to help you understand the material in the text.

VALUE: In completing this course, you will improve your military and professional knowledge. Importantly, it can also help you study for the Navy-wide advancement in rate examination. If you are studying and discover a reference in the text to another publication for further information, look it up.

1993 Edition Prepared by
ETC Allen F. Carney

Published by
NAVAL EDUCATION AND TRAINING
PROFESSIONAL DEVELOPMENT
AND TECHNOLOGY CENTER

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Sailor’s Creed

“I am a United States Sailor.

I will support and defend the Constitution of the United States of America and I will obey the orders of those appointed over me.

I represent the fighting spirit of the Navy and those who have gone before me to defend freedom and democracy around the world.

I proudly serve my country’s Navy combat team with honor, courage and commitment.

I am committed to excellence and the fair treatment of all.”
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## APPENDIX

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INDEX INDEX-1
This series of training manuals was developed to replace the Electronics Technician 3 & 2 TRAMAN. The content is directed toward personnel working toward advancement to Electronics Technician Second Class.

The nine volumes in the series are based on major topic areas with which the ET2 should be familiar. Volume 1, Safety, provides an introduction to general safety as it relates to the ET rating. It also provides both general and specific information on electronic tag-out procedures, man-aloft procedures, hazardous materials (i.e., solvents, batteries, and vacuum tubes), and radiation hazards. Volume 2, Administration, discusses COSAL updates, 3-M documentation, supply paperwork, and other associated administrative topics. Volume 3, Communication Systems, provides a basic introduction to shipboard and shore-based communication systems. Systems covered include man-pat radios (i.e., PRC-104, PSC-3) in the hf, vhf, uhf, SATCOM, and shf ranges. Also provided is an introduction to the Communications Link Interoperability System (CLIPS). Volume 4, Radar Systems, is a basic introduction to air search, surface search, ground controlled approach, and carrier controlled approach radar systems. Volume 5, Navigation Systems, is a basic introduction to navigation systems, such as OMEGA, SATNAV, TACAN, and man-pat systems. Volume 6, Digital Data Systems, is a basic introduction to digital data systems and includes discussions about SNAP II, laptop computers, and desktop computers. Volume 7, Antennas and Wave Propagation, is an introduction to wave propagation, as it pertains to Electronics Technicians, and shipboard and shore-based antennas. Volume 8, System Concepts, discusses system interfaces, troubleshooting, sub-systems, dry air, cooling, and power systems. Volume 9, Electrooptics, is an introduction to night vision equipment, lasers, thermal imaging, and fiber optics.
INSTRUCTIONS FOR TAKING THE COURSE

ASSIGNMENTS

The text pages that you are to study are listed at the beginning of each assignment. Study these pages carefully before attempting to answer the questions. Pay close attention to tables and illustrations and read the learning objectives. The learning objectives state what you should be able to do after studying the material. Answering the questions correctly helps you accomplish the objectives.

SELECTING YOUR ANSWERS

Read each question carefully, then select the BEST answer. You may refer freely to the text. The answers must be the result of your own work and decisions. You are prohibited from referring to or copying the answers of others and from giving answers to anyone else taking the course.

SUBMITTING YOUR ASSIGNMENTS

To have your assignments graded, you must be enrolled in the course with the Nonresident Training Course Administration Branch at the Naval Education and Training Professional Development and Technology Center (NETPDTC). Following enrollment, there are two ways of having your assignments graded: (1) use the Internet to submit your assignments as you complete them, or (2) send all the assignments at one time by mail to NETPDTC.

Grading on the Internet: Advantages to Internet grading are:

- you may submit your answers as soon as you complete an assignment, and
- you get your results faster; usually by the next working day (approximately 24 hours).

In addition to receiving grade results for each assignment, you will receive course completion confirmation once you have completed all the assignments. To submit your assignment answers via the Internet, go to:

http://courses.cnet.navy.mil

Grading by Mail: When you submit answer sheets by mail, send all of your assignments at one time. Do NOT submit individual answer sheets for grading. Mail all of your assignments in an envelope, which you either provide yourself or obtain from your nearest Educational Services Officer (ESO). Submit answer sheets to:

COMMANDING OFFICER
NETPDTC N331
6490 SAUFLEY FIELD ROAD
PENSACOLA FL 32559-5000

Answer Sheets: All courses include one “scannable” answer sheet for each assignment. These answer sheets are preprinted with your SSN, name, assignment number, and course number. Explanations for completing the answer sheets are on the answer sheet.

Do not use answer sheet reproductions: Use only the original answer sheets that we provide—reproductions will not work with our scanning equipment and cannot be processed.

Follow the instructions for marking your answers on the answer sheet. Be sure that blocks 1, 2, and 3 are filled in correctly. This information is necessary for your course to be properly processed and for you to receive credit for your work.

COMPLETION TIME

Courses must be completed within 12 months from the date of enrollment. This includes time required to resubmit failed assignments.
PASS/FAIL ASSIGNMENT PROCEDURES

If your overall course score is 3.2 or higher, you will pass the course and will not be required to resubmit assignments. Once your assignments have been graded you will receive course completion confirmation.

If you receive less than a 3.2 on any assignment and your overall course score is below 3.2, you will be given the opportunity to resubmit failed assignments. You may resubmit failed assignments only once. Internet students will receive notification when they have failed an assignment--they may then resubmit failed assignments on the web site. Internet students may view and print results for failed assignments from the web site. Students who submit by mail will receive a failing result letter and a new answer sheet for resubmission of each failed assignment.

COMPLETION CONFIRMATION

After successfully completing this course, you will receive a letter of completion.

ERRATA

Errata are used to correct minor errors or delete obsolete information in a course. Errata may also be used to provide instructions to the student. If a course has an errata, it will be included as the first page(s) after the front cover. Errata for all courses can be accessed and viewed/downloaded at:

http://www.advancement.cnet.navy.mil

STUDENT FEEDBACK QUESTIONS

We value your suggestions, questions, and criticisms on our courses. If you would like to communicate with us regarding this course, we encourage you, if possible, to use e-mail. If you write or fax, please use a copy of the Student Comment form that follows this page.

For subject matter questions:

E-mail: n315.products@cnet.navy.mil
Phone: Comm: (850) 452-1001, Ext. 1713
DSN: 922-1001, Ext. 1713
FAX: (850) 452-1370
(Do not fax answer sheets.)
Address: COMMANDING OFFICER
NETPDT C N315
6490 SAUFLEY FIELD ROAD
PENSACOLA FL 32509-5237

For enrollment, shipping, grading, or completion letter questions

E-mail: fleetservices@cnet.navy.mil
Phone: Toll Free: 877-264-8583
Comm: (850) 452-1511/1181/1859
DSN: 922-1511/1181/1859
FAX: (850) 452-1370
(Do not fax answer sheets.)
Address: COMMANDING OFFICER
NETPDT C N331
6490 SAUFLEY FIELD ROAD
PENSACOLA FL 32559-5000

NAVAL RESERVE RETIREMENT CREDIT

If you are a member of the Naval Reserve, you may earn retirement points for successfully completing this course, if authorized under current directives governing retirement of Naval Reserve personnel. For Naval Reserve retirement, this course is evaluated at 2 points. (Refer to Administrative Procedures for Naval Reservists on Inactive Duty, BUPERSINST 1001.39, for more information about retirement points.)
Student Comments

Course Title: Electronics Technician, Volume 2—Administration

NAVEDTRA: 14087
Date: _______________

We need some information about you:

Rate/Rank and Name: _______________ SSN: __________ Command/Unit _______________
Street Address: ____________________ City: __________ State/FPO: _______ Zip _______

Your comments, suggestions, etc.:

Privacy Act Statement: Under authority of Title 5, USC 301, information regarding your military status is requested in processing your comments and in preparing a reply. This information will not be divulged without written authorization to anyone other than those within DOD for official use in determining performance.

NETPDTC 1550/41 (Rev 4-00)
CHAPTER 1

GENERAL ADMINISTRATION

Records and reports are the bywords in administration. They are vital in each of the following department and division functions:

- The supervision and assignment of ETs
- The upkeep and cleanliness of the spaces
- Electronics supply
- Allocation of funding
- Procurement of tools; consumables (such as fuses, bulbs, solder), and equipage items to replace those lost, expended, or surveyed

Without records and reports, performing these functions would be impossible.

As an ET2, you will be involved with either creating or maintaining various administrative records and reports in addition to maintaining and repairing electronic equipment.

In this chapter we will discuss some of the reports that you may be involved in filling out. We will also cover the different periodicals that will assist you in your administrative responsibilities.

REPORTS

Reports, like inspections, are a “necessary evil” to the working technician. Without reports and a system of accountability, our job of maintenance and repair would be impossible. There would be no way to maintain supply support for our equipment, no way to know what equipment was on board, in what quantity, or where. In this section, we will introduce surveys, getting under way reports, casualty reports, and trouble reports and logs.

SURVEY

A survey is made and reported when naval property is (1) condemned as a result of damage, obsolescence, or deterioration, or (2) acknowledged to be nonexistent because of loss, theft, or total destruction. Figure 1-1 is a sample of the Report of Survey, DD Form 200.

You can find more information on DD Form 200 in NAVSUP P-485, Afloat Supply Procedures, located in your supply department.

GETTING UNDER WAY REPORT

The electronics material officer (EMO) is normally responsible for turning in an equipment status report before getting under way. You may be asked to furnish information about the equipment in your work center or about such diverse areas as:

- Major systems status
- Estimated time of repair (ETR)
- Power out and MDS readings from the radars
- Power out and receiver sensitivity readings from communications equipment

This report is usually a locally generated form and may vary between commands.

CASUALTY REPORT (CASREP)

The CASREP system contains four types of reports: initial, update, correct, and cancel. CASREPs are not a substitute for, but are in addition to and complement, 3-M data. You can find information on preparation and submission of casualty reports in Operational Reports, NWP 10-1-10 (formerly NWP 7 [REV. A]).

TROUBLE REPORTS AND LOGS

Trouble reports and logs are locally generated and, if used, are a great help in filling out 3-M documents. They are usually filled out each time an equipment trouble is detected. These reports and logs indicate such things as equipment affected, nature of the trouble, and time of failure. When the trouble has been corrected, the technician ensuring that the correction has been completed should then make an entry on the report or in the log stating so with the date of completion and his or her signature.

Other locally generated logs that your shop may maintain are a test equipment checkout log, to track test equipment on loan to other divisions; a consumable usage log, to track the use of the shop’s consumable supplies; and a tool accountability log, to track the tools issued to individuals.
Figure 1-1.—Report of Survey, DD Form 200.
PERIODICALS

Periodicals come in many variations. They maybe bulletins, magazines, messages, or publications. The periodicals that we discuss in the following paragraphs will bring you updates on equipment, safety items, and overall information that could affect you as an ET.

SHIPS SAFETY BULLETIN

The SHIPS SAFETY BULLETIN is published by the Naval Safety Center in Norfolk, Virginia. It is distributed on a monthly basis. Since it is a safety bulletin, the issues should be kept in a binder in the work center for reference.

This bulletin covers all aspects of safety information, from electrical safety shoes to revisions of safety courses. If your work center does not maintain copies of the SHIPS SAFETY BULLETIN, find out where they are kept and review them to keep yourself up to date on safety related items. Figure 1-2 is an illustration of the front cover of the SHIPS SAFETY BULLETIN.

AFLOAT SAFETY ADVISORIES

Safety advisories are sent out in message format and advise you of current and emergent safety-related items. The Afloat Safety Advisories are available from the Naval Safety Center, Naval Air Station, Norfolk, Virginia, on disk in WordPerfect 5.1 or ASCII format. Your command may contact the safety center for this disk at DSN 564-7634.

SAFETYLINE

Safetyline is a shore safety review periodical in magazine form. It is published bimonthly by the Naval Safety Center in Norfolk, Virginia. Safetyline is approved as an official publication for distributing safety-related information. This information informs Department of the Navy personnel about current safety concerns and emerging developments within their area of expertise to enhance their professional development. Although the contents of this periodical are informative, they are not considered directive.

The Safeline presents good articles on safety and is a beneficial addition to any shore-based ET shop library. Figure 1-3 is a sample front cover of Safetyline.
ENGINEERING INFORMATION BULLETIN (EIB)

The EIB is a monthly, authoritative publication distributed to afloat and shore activities. It is a means of rapid dissemination of advanced hull, mechanical, electrical, electronic, and related equipment information. The EIB contains information concerning:

- Approved beneficial suggestions
- Electronic field changes
- Installation techniques
- Maintenance notes and practices
- Technical manual corrections, availabilities and distribution.

Your ET shop should maintain a library of the EIBs for electronic systems for ready reference. It should also route all new EIBs to all personnel concerned with the topics for information and action.

You should familiarize yourself with the information contained in these periodicals. By doing so, you will help keep yourself current with changes to equipment and procedures. Figure 1-4 is an illustration of a front cover of an EIB.

DECKPLATE

Deckplate is published bimonthly and is a technical periodical in magazine form. It is published by the Naval Sea Systems Command (NAVSEA) and contains articles on design, construction, and repair of naval vessels and their equipment and other technical equipment and programs under NAVSEA command.

The content of deckplate is considered as information intended for information purposes only. Do not regard it as information that alters or supersedes official regulations, orders, or directives. Figure 1-5 illustrates the front cover of deckplate.

AIMS NEWSLETTER

The AIMS NEWSLETTER provides information to shipboard technicians and operators of AIMS systems. At present, it is printed only as needed. That is, when information is obtained and compiled by the Naval
Electronic Systems Engineering Activity (NESEA), a newsletter is written and sent out.

To obtain back copies of the AIMS newsletters, contact the Naval Electronic Systems Engineering Activity (Code 2114), St. Inigoes, Maryland. You may also access an AIMS hotline if you have questions or problems concerning maintenance. The number for the AIMS hotline is DSN 326-3512, extension 8229. Figure 1-6 is an illustration of the front cover of an AIMS NEWSLETTER.

FATHOM

FATHOM is an afloat safety review periodical in magazine form. It is published bimonthly by the Naval Safety Center in Norfolk Virginia. FATHOM contains articles pertaining to safety issues of concern to surface and submarine forces and is distributed primarily to these forces. Figure 1-7 shows a front cover of FATHOM.

In the previous paragraphs we have discussed only a few of the periodicals that are available in the fleet.

You may want to use the technical periodicals to keep up to date with any changes that may occur to policy or equipment configuration. However, remember, that most periodicals are for information purposes only and do not change or supersede policies, directives, or instructions.

USING SOURCES OF INFORMATION

Use bulletins, instructions, and periodicals to increase your knowledge of electronics. They are excellent sources for discovering new techniques in troubleshooting and testing of equipment, and for obtaining updates on safety procedures.

You can use individual command logs, such as those that we mentioned earlier, to keep an accurate history of equipment performance, and the location of test equipment.

You can also use the sources of information that we discussed above as training aids for new personnel. New personnel can use the sources to bring themselves up to date on new procedures and troubleshooting techniques. In addition they can use the
log books to learn about the operating history of the equipment they are assigned to maintain.

**MAINTAINING SOURCES OF INFORMATION**

Since sources of information are of great importance to every technician, there is a need to maintain, update, and care for all of them. In the remainder of this chapter, we will discuss how to care for the Electronics Technicians' primary sources of information.

**SCHEMATICS**

Let's begin with the schematics that took you so much time to color code when you were in school, particularly in “C” school. The instructor for schematics gave you certain information that you thought would be valuable in the future. You probably put that information on your schematics. After “C” school, you may have referred to those schematics during certain repair procedures. The schematics became good reference material. If you still have the schematics, laminate them and make them part of your personal, professional reference library.

Now let’s look at the schematics contained in your technical manuals. The first thing to remember is that the technical manuals in your shop are for every technician to use. Do not write on these schematics. If you do, you will probably confuse your shipmates when they need to use them. Often, these schematics tend to tear along the folds. Reinforce these areas with clear tape. Finally, be sure to fold the schematics neatly back into the technical manual when you have finished using them.

**SHOP LOGS**

Far too often, shop logs become scratch pads or doodle pads. To ensure that this does not happen with your shop logs, place them on bookshelves when you have completed your entries into them. Remember, these logs will contain information on equipment history that shipmates who arrive on board long after you have transferred may need to use.

**PERIODICALS**

Periodicals such as the EIB and the SHIPS SAFETY BULLETIN should be kept in hard binders in chronological order. Keep these binders in a bookcase or shelf in your shop for everyone in the shop to use. As we mentioned before, these periodicals are filled with technical and safety information.

**INSTRUCTIONS**

There are many instructions in the Navy, and to keep them all in your shop would be an impossibility. However, in many of these instructions, you will find pertinent information that pertains directly to the ET world, such as electronic safety, hazardous material control, and so on. When you come across this information, copy it and keep it in a binder for reference in your shop. Remember to keep this binder up to date as you receive changes to the instructions.

In this chapter we have discussed some of the reports, logs, and publications that will be helpful to you in your everyday job as a technician. You now have the responsibility to apply this information and to enhance your administrative skills. In the next chapter you will learn about the technical administration aspects of your job as an Electronics Technician.
CHAPTER 2

TECHNICAL ADMINISTRATION

Technical administration is basically the filling out of paperwork required to complete a task. Whether the task is maintenance or repair in nature, it is not fully completed until all documenting paperwork has been finalized. You, as the technician, are responsible for ensuring that all paperwork is completed for each task you are assigned.

THE MAINTENANCE DATA SYSTEM (MDS)

The Maintenance Data System (MDS) provides a means of recording maintenance actions in substantial detail. This allows a variety of information concerning these actions and the performance of equipment involved to be retrieved. (In older documents, you may see the system refereed to as MDCS.) One of the major objectives of the MDS is to provide the capability of reporting configuration changes. In the following paragraphs, we will describe MDS subsystems that you will use frequently.

MAINTENANCE DATA SYSTEM (MDS) FORMS

In the following paragraphs we will briefly discuss the MDS forms that you as an ET are most likely to come across in your daily routine. For more in-depth information on the MDS forms, we recommend that you read chapter 9 of OPNAVINST 4790.4, Ships’ Maintenance and Material Management (3-M) Manual. Because the supply forms associated with the MDS have been discussed in other training manuals, we will not cover them here.

Ship's Maintenance Action Form-OPNAV 4790/2K

This form, shown in figure 2-1, is the primary maintenance form. It is used by maintenance personnel to report (1) deferred maintenance actions and (2) all completed maintenance actions (including previously deferred actions).

The OPNAV 47902K contains six sections that require entries, depending on the type of maintenance action being reported. The form is printed on paper that does not require carbon to make multiple copies. Whenever you make an entry on this form, print the information, using all CAPITAL letters. Be sure the information is legible and inserted within the “tic” marks. If you make an error, line it out using a single line and enter the correct information.

Supplemental Form-OPNAV 4790/2L

This form, illustrated in figure 2-2, is used to provide amplifying information for a maintenance action reported on a 2K form. For example, you may include on the 2L information from drawings, listings, associated parts placement, part labels, and the like, for use by a repair activity.

When you need to use an OPNAV 4790/2L with an OPNAV 4790/2K, enter in block 35 of the 2K the notation “2L USED.”

Maintenance Planning and Estimating Form-OPNAV 4790/2P

This form is used with an OPNAV 4790/2K that defers maintenance to be done by an IMA under the Intermediate Maintenance Management System (IMMS). It provides information necessary to allow screening and planning to be done in detail.

Figure 2-3 illustrates this form as it may appear when planning and scheduling have been completed by a repair activity. Chapter 12 of OPNAVINST 4790.4B contains detailed information on the use of the form.
Figure 2-1.—OPNAV 4790/2K, Ship's Maintenance Action Form.
Figure 2-2.—OPNAV 4790/2L Supplemental Form.
**SECTION I. PLANNING**

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**SECTION III. TECHNICAL DOCUMENTATION**

| 44. ON BOARD TEST NO. |

**SECTION IV. UIC/REPAIR ACTIVITY/TYCOM REMARKS**

**IMA LIMIT REPAIRS TO 6.0.0 MATERIAL**

**SECTION V. SUPPLEMENTAL PLANNING**

| 60. EST MANDAYS | 51. EST MANDAYS COSTS | 52. EST MATERIAL COSTS | 53. EST TOTAL COSTS |

---

Figure 2-3—OPNAV 4790/2P, Maintenance Planning and Estimating Form.
Automated Ship's Maintenance Action
Form-OPNAV 4790/2Q

This form, shown in figure 2-4, is basically the same as the 4790/2K, except that it is filled in by computer. It contains the same information as the 2K. You may enter additional information by hand as necessary. You may also use this form as an automated work request and in preparation for INSURV.

**NOTE:** Data entered into the computer is checked for accuracy and completeness. Elements that contain
errors are brought to the attention of the operator for correction as required by OPNAVINST 4790.4.

**Automated Work Request (AWR)-OPNAV 4790/2R**

This form is produced by the computer and combines the basic information submitted on the OPNAV 4790/2K and the planning information submitted on the OPNAV 4790/2P, if the 2P has been entered into the IMMS. A simulated AWR, produced under the Shipboard Non-Tactical ADP System (SNAP), is a valid work request and will be accepted by all involved activities (see figure 2-5). An AWR may be used for any of the following purposes:

- To describe all work and planning information relating to a specific job
- To enter planning information relating to a specific job with the OPNAV 4790/2K replacing the OPNAV 4790/2P
- By an IMA to conduct advance planning of a tended unit’s availability

Chapter 12 of OPNAVINST 4790.4 contains detailed information on this form.

**Ship's Configuration Change Form-OPNAV 4790/CK and Ship's Configuration Change Form Continuation Page-OPNAV 4790/CK(C)**

These forms shown in figures 2-6A and 2-6B are used to report configuration changes at the individual equipment level.

When you use the OPNAV 4790/CK form, you do not need to document the associated maintenance action on an OPNAV 4790/2K form. The OPNAV 4790/CK(C) form is used both as a closing deferral for reporting the accomplishment of a previously deferred maintenance action that results in a configuration change, and as a completed maintenance action (no prior deferral) reporting a configuration change.

A configuration change occurs whenever a maintenance action results in the following situations:

1. Addition or installation of any new equipment.
2. Deletion or removal of any installed equipment.
3. Replacement or exchange of any equipment. A replacement or exchange is reported as the removal of an installed equipment and installation of a new equipment.

4. Modification of any installed equipment. A modification results from a maintenance action that alters the design or operating characteristics of the equipment, or a maintenance action in which nonstandard replacement parts (not identified on the APL or in the technical manual) are used.

5. Relocation of any equipment.

6. Accomplishment of any alteration directive.

Two excellent documents that provide block-by-block instructions for completing the OPNAV 4790/CK are OPNAVINST 4790.4 (3-M Manual) and SPCCINST 4441.170, the COSAL Use and Maintenance Manual.

**CURRENT SHIP'S MAINTENANCE PROJECT (CSMP)**

The CSMP is an administrative system that provides the command and work center with the management data needed for the systematic accomplishment of repair and alteration of ship’s hull, installed equipment, and material. It identifies at any one time the backlog of deferred maintenance for each work center. The MDS provides the means for gathering this information. If the information provided is not accurate or up-to-date or is improperly used by supervisors or maintenance technicians, the CSMP system is worthless.

The usefulness of the MDS depends upon your accuracy, thoroughness, and timeliness in reporting information. The MDS is a system in which potential benefits are directly proportional to the efforts applied. Programs for improving reliability, maintainability, and logistic support of fleet equipment depend on how conscientiously you adhere to reporting procedures.

**PLANNED MAINTENANCE SYSTEM (PMS)**

The Planned Maintenance System provides each command with a simple standard means for planning, scheduling, controlling, and performing planned maintenance of all equipment. PMS maintenance actions are the minimum required to maintain the equipment in a fully operable condition. Maintenance procedures are contained on cards called “maintenance requirement cards” (MRCs).

**Maintenance Requirement Cards (MRCs)**

The MRCs provide detailed information for performing preventive maintenance. They state exactly...
Figure 2-5.—OPNAV 4790/2R, Automated Work Request (AWR).
Figure 2-6A.—OPNAV 4790/CK, Ship's Configuration Change Form.
Figure 2-6B.—OPNAV 4790/CK(C), Ship's Configuration Change Form Continuation Page
the "who, what, when, how, and with what resources" associated with a specific maintenance requirement. (See figure 2-7.)

Some MRCs have equipment guide lists (EGLs) accompanying them to serve as location guides for a number of identical equipments. A blank EGL is shown in figure 2-8.

**List of Effective Pages (LOEP)**

The work center LOEP contains a list of the Maintenance Index Pages (MIPs) and a brief description of the systems and equipments in the work center.

**Maintenance Index Page (MIP)**

A MIP contains a brief description of the maintenance requirements on all the MRCs for each item of equipment.

**Schedules**

Maintenance is scheduled on cycle, quarterly, and weekly schedules.

Cycle Schedule-Displays the PMS requirements to be performed during the period between major overhauls.

Quarterly Schedule-Displays each work center's PMS requirements to be performed during a specific 3-month period.

Weekly Schedule-Displays the planned maintenance scheduled for accomplishment in a work center during a specific week.

**PMS Feedback Report (FBR)-OPNAV 4790/7B**

The PMS feedback report, shown in figure 2-9, provides the command with an easy method of
recommending changes to maintenance requirement cards, ordering MRCs that have been lost or mutilated, and notifying the systems commands of any discrepancies in coverage.

The FBR is a five-part form composed of an original and four copies. Instructions for preparing and submitting the form are printed on the back of the last copy as illustrated in figure 2-10. You can obtain these forms through the Navy Supply System. For detailed instructions on 3-M procedures, refer to OPNAVINST 4790.4B.

THE TECHNICAL LIBRARY

Now that we have discussed the paperwork needed to complete maintenance actions, we will look at the technical library that should be setup and maintained to provide technicians the technical documents they need to perform maintenance.

In the following paragraphs we will discuss various manuals and publication that will give you a good starting point for a technical library.

PUBLICATION APPLICABILITY LISTING (PAL)

The PAL lists technical manuals, operating instruction charts, performance standards sheets, maintenance standards books, and technical manual changes for operating and maintaining onboard systems and equipments that are under the technical cognizance of NAVSEASYSCOM.

The PAL is produced from the Ships' Technical Publications System, NAVSEA's technical manual information system, and is maintained by the Naval Ship's Data Support System (NSDSS), Port Hueneme, California. Although the PAL provides assistance in determining the publications needs of the ship or shore station to which it applies, it is not a list of required publications.

The PAL contains four separately bound volumes, each having two parts:

- Volume 1—General Publications
  Part 1—Electronics, HM&E, and Miscellaneous
  Part 2—Weapons

Volume 1 lists only general and ship-applicable publications that do not relate to equipments or systems. It does not include any of the publications that appear in Volumes 2, 3, and 4.

- Volume 2—Electronics
  Part 1—Equipment sequence
  Part 2—Publication sequence

- Volume 3—HM & E
### Maintenance Standards Handbooks

Maintenance standards handbooks describe a series of specially developed preventive maintenance procedures that, when performed as directed, will reveal areas of subnormal performance and provide for:

- **Part 1**: Equipment sequence
- **Part 2**: Publication sequence
- **Volume 4**: Weapons
  - **Part 1**: Equipment sequence
  - **Part 2**: Publication sequence

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**Figure 2-9.—OPNAV 4790/78, PMS Feedback Report (FBR).**
Figure 2-10.—Instructions for Preparing the PMS Feedback Report (reverse side of FBR form).

effective mechanical and electrical maintenance of the equipment. The installing activity performs those procedures on the equipment when it is operating properly and publishes the results as “designated reference standards.” The designated reference standards collectively represent normal performance. This allows you to compare the results of a scheduled test with the reference standards to identify, properly analyze, and correct abnormalities.

NAVAL SHIPS' TECHNICAL MANUAL (NSTM)

The NSTM is a set of books (chapters) that contain general information on a variety of topics. You can find...
a complete listing of the NSTM chapters in chapter 001, General - NSTM Publications Index and User Guide. The chapters we have listed below are related to your job, both as a technician and as a member of a ship's or station's organization.

**NSTM Chapter 79–Practical Damage Control (DC)**

This chapter provides broad guidance for establishing a DC organization. This guidance is designed to help organizations plan before damage occurs, spend a minimal amount of time localizing damage that does occur, and make emergency repairs or restoration as quickly as possible after damage occurs.

**NSTM Chapter 300–Electrical Plant**

This chapter provides information and instructions on electrical equipment, electrical safety precautions, electrical insulation and insulation resistance, and maintenance reconditioning of electrical equipment. It provides the requirements we, as ETs, must meet in a shipboard safety program, including use and maintenance of organizational electrical and electronic equipment and personal electrical and electronic equipment.

**NSTM Chapter 400–Electronics**

This chapter provides major policies and instructions pertaining to maintenance of electronic equipment and safety information aboard active and reserve ships.

**NSTM Chapter 631–Preservation of Ships in Service**

This chapter provides instructions, requirements, and information for prevention of corrosion of ships, boats, and small craft. Topics include surface preparation, painting, and application of other preventive measures.

**NSTM Chapter 634–Deck Coverings**

This chapter provides information concerning materials, installation procedures, maintenance and repair of deck coverings, gratings, sealing methods, and caulking compounds used for sealing deck seams.

**ELECTRONICS INSTALLATION AND MAINTENANCE BOOK (EIMB)**

The EIMB is the medium for collecting, publishing, and distributing, in one convenient source, safety information, maintenance policies and philosophies, installation standards and practices, and overall electronic equipment and material-handling procedures required by Chapter 400 of the Naval Ships' Technical Manual. The EIMB is organized into a 13-volume series of individual books.

**EIMB General Handbook**

This handbook provides data pertaining to administration, supply, publications, and safety matters, and contains the subject index for information contained in the other handbooks.

**EIMB Installation Standards Handbook**

This handbook issues approved standards, techniques, and practices for the installation of electronic equipment aboard ships.

**EIMB Electronic Circuits Handbook**

This handbook provides the theory of operation and circuit description of basic vacuum tube and semiconductor circuits.

**EIMB Test Methods and Practices Handbook**

This handbook provides technicians with reference information on the fundamentals of test methods and basic measurements, step-by-step procedures for testing typical electronic circuits and equipment, and fictional descriptions of the theory of operation of the test equipment used and circuits tested.

**EIMB Reference Data Handbook**

This handbook contains an encyclopedic presentation of useful and informative definitions,
abbreviations, formulas, and other general data related to electronics installations and maintenance.

**EIMB EMI Reduction Handbook**

This handbook contains techniques and procedures for the elimination or reduction of electromagnetic interference created by own force's electromagnetic radiating devices.

**EIMB General Maintenance Handbook**

This handbook contains routine maintenance concepts, techniques, and procedures common to all electronic and electrical equipment.

**EIMB Equipment-Oriented Handbooks**

For the basic equipment category, each of the six handbooks contains general servicing information; servicing information for specific equipments; a field change identification guide that provides field change information for all equipments of the basic equipment category; and functional descriptions common to the equipment of the basic equipment category. The six equipment-oriented handbooks are as follows:

1. Communications
2. Radar
3. Sonar
4. Test Equipment
5. Radiac
6. Countermeasures

Periodically, the equipment-oriented handbooks are updated by incorporating the Engineering Information Bulletin (EIB) articles. The EIMBs are an excellent source of basic information that can be used as a training tool for your workcenter. If space is available, you will benefit from having a complete set for your technical library.

**OTHER PUBLICATIONS**

There are many other useful publications throughout the fleet. However, because of the vast number, we will only describe a few in the following paragraphs.

**Shipboard Antenna Systems Manuals**

These five manuals serve as a source of information for personnel concerned with the installation and maintenance of shipboard antennas. The information they contain supplements, but does not supersede, existing specifications. The following is a list of what each volume contains:

- Volume 1—Communications Antenna Fundamentals
- Volume 2—Installation Details, Communications Antenna Systems
- Volume 3—Antenna Couplers, Communications Antenna Systems
- Volume 4—Testing and Maintenance, Communications Antenna Systems
- Volume 5—Antenna Data Sheets

**Miniature/Microminiature (2M) Electronic Repair Program**

While this publication (three volumes under one cover) gives procedures and techniques, personnel must be formally trained and certified to make high-quality, reliable repairs to state-of-the-art electronic printed circuits and modules.

**Shipboard Bonding, Grounding, and Other Techniques for Electromagnetic Compatibility and Safety, Military Standard 1310 (NAVY)**

The requirements of this standard apply to all new shipboard installations and to any part of an existing installation that is being modified. The procedures and methods specified in this standard apply to any situation that requires the technician to (1) bond, ground, insulate, or use nonmetallic materials to provide electromagnetic compatibility; (2) provide personnel safety from electrical shock hazards; (3) safeguard electrical transmissions of classified information; and (4) provide a dc reference ground. We recommend this publication as a MUST reading assignment for all Electronics Technicians.

**Electromagnetic Radiation Hazards (Hazards to Personnel, Fuel, and Other Flammable Material)**

This manual prescribes operating procedures and precautions to prevent injury to personnel, ignition of
volatile vapors, and premature initiation of electroexplosive devices in ordnance caused by exposure to environmental electromagnetic radiation.

Data in this manual are provided in two volumes as follows:

- **Volume I**
  - Hazards to Personnel, Fuel, and Other Flammable Material (U)

- **Volume II**
  - Part I–Hazards to Unclassified Ordnance Systems (U)
  - Part II–Hazards to Classified Ordnance Systems (U)

Volume I and Volume II, Part One, are unclassified. All classified data are contained in Volume II, Part Two.


This standard sets forth the design and installation criteria that apply to shipboard secure electrical information processing systems, including detailed hardware and equipment requirements and the applicable inspection and reporting procedures and documentation. Installation and maintenance technicians of these processing systems MUST be well versed in the contents of this standard.

**General-Purpose Electronic Test Equipment, Military Standard 1364 (Series) (NAVY)**

This standard identifies standard General-purpose Electronic Test Equipment (GPETE), GPETE support items, and General Use Portable Electrical Equipment (GUPEE) that are suitable for Navy use and for which the Naval Sea Systems Command exercises material support responsibility by management of item entry. This standard also establishes uniform procedures for submission of applications to procure nonstandard GPETE.


This specification sets forth the content and format requirements for FOMMS, and their revisions and changes, necessary for the installation operation, repair (organizational-level, intermediate-level, and depot-level), and parts support of equipment, systems, and subsystems without the services of manufacturer's representatives.

**Procedures for Conducting a Shipboard Electromagnetic Interference (EMI) Survey (Surface Ships), Military Standard 1605 (SHIPS)**

This standard provides detailed procedures for conducting an electromagnetic interference survey aboard surface ships.

**Navy Electricity and Electronics Training Series (NEETS)**

At present there are 24 NEETS modules. These modules contain a vast amount of information from an introduction to matter, energy, and direct current to an introduction to fiber optics.

The NEETS modules are high quality training aids as well as excellent review publications for basic electronics for all ETs.

**CATALOGS, LISTS, INDEXES, AND DIRECTORIES**

The following paragraphs will discuss catalogs, lists, indexes and directories of electronic equipment.

**Equipment Identification Code (EIC) Master Index**

This index provides a listing of equipment identification codes (EICs) in two sections. Section I lists EIC numbers in numerical sequence and identifies the equipment nomenclature assigned to each EIC number. Section II is the complement of Section I. It lists nomenclature in alphanumerical sequence and identifies the EIC numbers assigned to equipment.
Guide for User Maintenance of NAVSEA Technical Manuals

The maintenance of up-to-date technical manuals aboard your command is essential to the operational readiness of the command systems and equipment. This guide will be an important part of the technical library.

Electrostatic Discharge Control Handbook for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding electrically initiated explosive devices) (METRIC), Military Handbook 263A

This handbook provides guidance, not requirements, for the establishment and implementation of an Electrostatic Discharge (ESD) Control Program according to the requirements of MIL-STD-1686. This document applies to the protection of electrical and electronic parts, assemblies and equipment from damage due to ESD. It does not provide information for the protection of electrically initiated explosive devices.


This manual outlines the procedures that apply to Navy calibration facilities using the system, ship and shore activities obtaining services from them, and other military activities whose use of MEASURE is in effect.
CHAPTER 3

LOGISTICS

As an Electronics Technician, you will definitely be involved with the supply department in getting the exact items you need to complete your tasks. To work effectively and smoothly with the supply department, you must understand how to use the supply system. This chapter should help you understand the overall operation of the system.

NAVAL SUPPLY SYSTEMS COMMAND

The Naval Supply Systems Command (NAVSUPSYSCOM) controls the procurement of materials and services throughout the Department of the Navy. It combines into one overall system inventory managers, distribution activities, and other activities that are responsible for providing responsive and efficient material support to the operating forces of the Navy.

INVENTORY MANAGERS

Navy inventory managers have the primary responsibility for managing assigned groups or categories of items of supply. The primary function of an inventory manager is to balance parts required and parts available so that Navy fleet and shore activities receive effective and efficient support. Navy inventory managers include systems commands, project managers, bureaus, offices (including Military Sealift Command), and inventory control points (ICPs) under the command of NAVSUPSYSCOM.

INVENTORY CONTROL POINTS (ICPs)

Each ICP manages one or more types of material held at stock points in a distribution system. The ICPs position materials at stock points, maintain inventory control through an extensive stock reporting system, and provide technical assistance and cataloging services to the supply system and its customers.

STOCK POINTS

Stock points are large facilities, such as supply centers and depots, that stock parts and assemblies for shipment to requesting commands.

Supply Centers and Depots

Naval supply centers (NSCs) and depots are command organizations that furnish supply support to fleet units and shore activities. These stock points are primarily concerned with procuring, receiving, storing, issuing, and shipping material. Fleet and shore activities send requisitions to the stock points; which, in turn, ship the material and bill the unit for payment. The stock points inform the ICPs of material shipped so the ICPs can track the inventory level and determine when to buy additional material. Stock points stock Navy, Defense Logistics Agency, and General Service Administration cognizance material for issue to supported units.

Supply centers and depots perform similar functions, but at different levels. Supply centers are managed by the Naval Supply Systems Command and support supply depots and other activities that perform depot functions. Supply depots are commanded by a fleet command and normally support only local commands.

Industrial Naval Air Stations (INASs)

The INASs are primary Navy stock points for aviation material. These stock points are collocated with Naval Aviation Depots (NADEPs) and function as storage and shipment points of aviation cognizance material. The INASs report transactions of aviation material to the cognizant ICP.

MOBILE LOGISTICS SUPPORT FORCE (MLSF)

The purpose of the MLSF is to release deployed fleet units from direct dependence on shore bases for supply support. To do this, the MLSF stocks militarily essential items in high demand by deployed fleet units. The materials carried by MLSF ships are listed in the Consolidated Afloat Requisitioning Guide Overseas (CARGO), NAVSUPP-4998-A(Atlantic) and P-4990-P (Pacific).
**GENERAL SERVICES ADMINISTRATION (GSA)**

The General Services Administration controls items of material that are common to both military and civilian worlds. Examples of GSA items are paint, paper, handtools, chalkboards, movie projectors, and the like. GSA items are stocked at the naval supply centers located in Norfolk Virginia; and San Diego, California.

**DEFENSE LOGISTICS AGENCY (DLA)**

The Defense Logistics Agency controls items of material that are common to all the military services but not to the civilian world. Examples of DLA items are fuels and bullets. DLA items are also stocked at the Norfolk and San Diego naval supply centers.

**INTEGRATED NAVY SUPPLY SYSTEM**

The Navy supply system is an integrated system, allowing materials to be obtained usually from more than one point in the system. In the remainder of this chapter, we will discuss the Navy supply system in general, introduce the primary instructions and forms, and provide a brief description of how to use the system to get parts and supplies.

The following is a description of how the integrated Navy Supply System might react to a typical supply requisition:

1. **USS Ship requisitions cognizance symbol 9N material from the NSC.**
2. **The NSC, a Navy retail stock point, usually ships the requested material. However, after screening its stocks, the NSC determines that the requested material is not carried. It then refers the requisition to the Defense Electronics Supply Center (DESC), Dayton, the cognizant inventory manager.**
3. **The DESC, Dayton, after researching its master records and determining that the material is available at NSC Oakland (a specialized support point), refers the requisition to NSC, Oakland.**
4. **The NSC, Oakland, issues the material to USS ship.**
5. **The NSC, Oakland, then makes an issue transaction report to DESC, Dayton.**
6. **The DESC, Dayton, after applying the issue report to its master record, learns that stock of the item at NSC, Oakland, is below the required level and issues a contract to the ABC Corporation for additional stocks of the item.**
7. **The ABC Corporation ships the material to NSC, Oakland.**
8. **The NSC, Oakland, makes a receipt transaction report to DESC, Dayton.**

As you can see, if an item is not available at the local NSC, the requisition does some traveling. So it may take a little time to get the item you requested.

**COORDINATED SHIPBOARD/SHOREBASED ALLOWANCE LIST (COSAL/COSBAL)**

The COSAL/COSBAL is the document that drives the operational and supply support for a ship. It is a dynamic document that changes constantly, as the ship’s configuration changes. Each ship in the U.S. Navy has its own COSAL or COSBAL tailored specifically to its mission. The COSAL or COSBAL lists include the following:

- The equipment or components required for the unit to perform its operational assignments
- The repair parts and special tool required for the operation, overhaul, and repair of those equipments
- The miscellaneous portable items necessary for the care and upkeep of the unit

The COSAL/COSBAL is both a technical document and a supply document. It provides nomenclature, operating characteristics, specifications, parts list, and other technical data pertaining to all installed equipment and machinery. It also provides nomenclature and characteristics of the equipage and tools required to operate and maintain the unit and its equipment.

No one can predict exactly when a circuit card in an AN/URT-23 will fail or when a bearing will wear out in a freshwater pump. However, the COSAL/COSBAL can help maintenance and supply personnel in a unit to make an educated guess. The COSAL/COSBAL computers analyze the frequency of failures of parts used aboard units and, based on these analyses, develop an allowance of repair parts that the supply officer should stock.

The COSAL/COSBAL is used primarily for two purposes-to identify repair parts (storeroom items) and to determine operating space allowances (equipage).
Description of COSAL Parts and Sections

Since the COSAL and COSBAL are similar, we will describe just the COSAL parts and sections. Certain aviation components (aviation supply offices [ASOs]) will also be included in the COSAL when specifically designated. For more information and complete instructions in the use of the COSAL, we recommend that you read the COSAL Use and Maintenance Manual, SPCCINST 4441.170.

Each COSAL publication is produced in three parts. Part I contains indexes. Part II contains associated APLs and AELs. Part III contains allowances and cross-reference data. The three parts are subdivided as follows:

Part I

Summary of Effective Allowance Parts/Equipage Lists (SOEAPL)

Index—Section A (Equipment Nomenclature Sequence)

Index-Sections B, C, D, and E

Part II

Section A—Allowance Parts Lists (APLs)

Section B—Circuit Symbol Data (microfiche only)

Section C—Allowance Equipage Lists (AEL)

Part III

Section A—Storeroom Items (SRI)

Stock Number Sequence List (SNSL)

Section B—Operating Space Items (OSI)

Stock Number Sequence List (SNSL)

Section CF—Maintenance Assistance Module (MAM)

Section CR—Ready Service Spares (RSS)

Section D—Alternate Number Cross-Reference to Stock Number

Section E—General Use Consumables List (GUCL)

Section F—Forms and Publications

The following paragraphs provide a brief description of the parts of the COSAL listed above:

PART I—SUMMARY.— The Summary of Effective Allowance Parts/Equipage Lists (SOEAPL) is a numerical listing of all APLs and AELs used to determine how many of each part is listed on the stock number sequence list (SNSL). Figure 3-1 is an example of a summary page, with a description of the information it contains.
**Figure 3-2.—COSAL indexes.**
<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1. | Equipment/Component Military Essentiality Code | Indicates those items of equipment that are essential to the ship's mission.  
V - Vital. Failure of the equipment could reduce the ship's capability to perform its mission.  
NV - Nonvital. Failure of the equipment would not adversely affect the ship's mission. |
| 2. | Equipment/Component/Equipage Nomenclature/Characteristics | The noun name and partial characteristic description of each APL and AEL. |
| 3. | Identification Number | The APL or AEL identification number. |
| 4. | Quantity | The quantity of each equipment/component per service aboard ship, covered by the applicable APL. Column 4 will be blank for all AELs. |
| 5. | Column Number | The applicable AEL column number from which the allowance is determined. This column is blank for all APLs. |
| 6. | Notes | A code that indicates specific information about an APL/AEL entry. These codes are listed and defined in the Introduction. |
| 7. | Allowance Support Code | Reserved for future use. (See item 11.) |
| 8. | Service Application/Information | The service or major shipboard function in which the equipment/component/eqipage operates or performs a service. |
| 9. | Ship Type and Hull Number | The specific ship for which the COSAL is prepared. |
| 10. | Date | Date of preparation (may be expressed as Julian or month-day-year date). |
| 11. | Allowance Support Codes | Pertains to item 7. |
| 12. | Page | Consecutive page numbering from first page to last. Page numbers preceded by “H” apply to Hull, Mechanical and Electrical (Example H-1). Page numbers preceded by “Z” apply to Ordnance (Example Z-1). |

*Refer to Figure 3-2.

**PART I-COSAL INDEX.** The Index identifies the APLs and AELs associated with the ship’s equipment. It also provides other information, such as the code of the work center responsible for the maintenance and various maintenance-related codes. The index is published in five parts, sections A through E. Sections A and B provide a cross-index of all APL/AELs listed in Part II. They contain the same information, but in two slightly different formats. Figure 3-2 shows both the A and B indexes. All areas of information are in the same relative positions, except that column 8 in Section A listings shifts over to become column 1 in section B listings.

The bulk of the information you will need to repair an item covered by COSAL is contained on the appropriate APL or AEL. To identify the appropriate APL or AEL, you will need to look up either the name of the equipment in Section A or the use of that equipment in section B.

Table 3-1 describes the uses of the Index columns and is keyed to the numbers shown in Figure 3-2.
Figure 3-3.—Allowance parts list (APL).
PART II, SECTION A-ALLOWANCE PARTS LIST (APL).—An APL (fig. 3-3) is a technical document that lists the repair parts authorized to be kept on board a ship for a particular piece of equipment. Separate APLs are prepared for each different piece of equipment on board a ship and for each major component of the equipment. APLs are listed in numerical sequence by identification number in Part II of the COSAL. The parts data contained in each APL is arranged in alphanumeric order by part reference or symbol number. This part number is a number, other than a stock number, by which the part may be identified. Examples of such a number are a manufacturer's number, a service part number, and a drawing or circuit symbol number. In table 3-2, the

<table>
<thead>
<tr>
<th>Table 3-2.—Data Elements of the APL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Equipment/Component Nomenclature/Characteristics</td>
</tr>
<tr>
<td>2. Technical Document Number</td>
</tr>
<tr>
<td>3. Identification Number</td>
</tr>
<tr>
<td>4. Date</td>
</tr>
<tr>
<td>5. Page</td>
</tr>
<tr>
<td>6. Characteristics</td>
</tr>
<tr>
<td>7. Reference/Symbol Number</td>
</tr>
<tr>
<td>8. Additional Data Area</td>
</tr>
<tr>
<td>9. Item Name</td>
</tr>
<tr>
<td>10. Stock Number</td>
</tr>
<tr>
<td>11. Accessory Components</td>
</tr>
<tr>
<td>12. Federal Supply Code for Manufacturers (FSCM)</td>
</tr>
<tr>
<td>13. Parts Military Essentiality Code (Part MEC)</td>
</tr>
<tr>
<td>14. Source Code</td>
</tr>
<tr>
<td>15. Maintenance Code</td>
</tr>
<tr>
<td>16. Recoverability Condensation Code</td>
</tr>
<tr>
<td>17. Notes Code</td>
</tr>
<tr>
<td>18. Quantity in One Equipment/Component</td>
</tr>
<tr>
<td>19. Unit of Issue</td>
</tr>
<tr>
<td>20. Allowance Item Code</td>
</tr>
<tr>
<td>21. On-Board Allowance Table</td>
</tr>
<tr>
<td>22. Ship Type and Hull Number</td>
</tr>
<tr>
<td>23. Page</td>
</tr>
<tr>
<td>24. Identification Number</td>
</tr>
<tr>
<td>25. Date</td>
</tr>
<tr>
<td>26. Page</td>
</tr>
</tbody>
</table>

*Refer to Figure 3-3.
different data elements are numbered and refer to the
numbers in figure 3-3.

PART II, SECTION B-CIRCUIT SYMBOL
DATA.– Section B (fig. 3-4) is furnished as microfiche
with the COSAL. It contains those CSNs that appear in
the technical manual for the equipment and is arranged
in circuit symbol number (CSN) sequence. The CSNs
are cross referenced to the NIIN/PNICN/TNICN part
number that appears in Section A. Table 3-3 identifies
the data elements of the APL (Part II, Section B) and
refers to the numbers in figure 3-4.

PART II, SECTION C-ALLOWANCE
EQUIPAGE LIST (AEL).– The AEL is a technical and
supply document prepared for various categories of
equipage associated with mechanical, electrical,
electronic, and ordnance systems. When an AEL is
written for a system, it identifies the items required to
operate the system and the repair parts required to
maintain it. The AEL lists specific information for each
item, such as name, NSN, unit of issue, quantity needed,
and quantity allowed on board. AELs are filed in
numerical sequence by AEL identification number. As a
technician, you should be aware of where all pertinent
AELs can be found.

PART III, SECTIONS A, B, CF, AND
CR-STOCK NUMBER SEQUENCE LISTS
(SNSL).– The SNSL is a product of today’s data
processing capability and is a great time-saver in
controlling parts and other items. Consider the amount
of work that would be necessary to determine how many
of what items to order by just using the APL and AELs.
The SNSL has four listings of all NSNs that apply
to your unit. They are Section A, Storeroom Items
(SRIs); Section B, Operating Space Items (OSIs); and
Section CF, Maintenance Assistance Module (MAM); and
Section CR, Ready Service Spares (RSS). These

Figure 3-4.—Allowance parts list (APL), Section B.
Table 3-3.—Data Elements of the APL, Section B

1. Unit. The Unit Number assigned by the manufacturer. (Part of the CSN).

2. CSN — Circuit Symbol Number which is obtained from the equipment technical manual or drawings. (Also known as the Reference Symbol Number.) When APLs are in Part Number sequence, the Part Number will appear in this space.

3. Notes — For Codes and Definitions see Appendix (C).

4. FSCM-REF# / ACN/NIIN — The FSCM and reference number, ACN or NIIN which applies to this CSN.

5. SMR — Source and Maintenance Recoverability Code which applies to this application. (see Appendix C for definition).

6. APPL — Number of applications with the same CSN.

7. ADD — An addendum indicator showing how this item was affected by cumulative addenda issued by SPCC. for this APL, (i.e., A = Added, D = Deleted, C = Changed, F = NIIN update, * = this item is appearing for the first time in this addendum. When the APL is revised, no addendum indicators appear.

8. Nomenclature. The equipment for which the APL is prepared.

9. APL Number. The equipment/component identification number.

HOW TO USE SECTION B

Determine the NIIN (FIIN) ACN or Part Number from Section B, referring to the Reference Symbol Number on Part II, Section A or C (whichever is applicable). The Reference Symbol Number is crossed to the stock number column which will reflect the latest NSN or ACN. Refer to the applicable section of the COSAL Part III to determine if the item is allowed.

* Refer to Figure 3-4.

Sections contain information such as stock number, item name, identification of the equipment in or on which the item is intended for use, and specific supply management information.

PART III, SECTION E-GENERAL USE

CONSUMABLES LIST (GUCL).— The GUCL identifies consumables used for general purposes in the routine maintenance and administration of the ship. The items listed in the GUCL are in addition to materials listed in other parts of the ship's COSAL. The GUCL is published by the Fleet Material Support Office (FMSO), but only for new construction, major conversion, or reactivated units. Normally, it will not be published with or for COSALs resulting from ship overhaul or maintenance actions.

The GUCL contains basic information, such as nomenclature, NSN, unit of issue, weight, and price for both hazardous and nonhazardous materials kept or used in operating spaces and store rooms.

PART III, SECTION F-FORMS AND PUBLICATIONS.— Section F identifies the various forms and publications the ship needs to conduct normal business and provides information on how to obtain them.
How to Use the COSAL

Once you become familiar with the indexes, you will find the COSAL easy to use. The best way to gain this familiarity is by studying the COSAL for your command. Read the entries in both the Part I, Section A and B indexes, then see how they provide across-index by using the same entries but in a different sequence. As you study the entries, refer to the introduction for the meanings of abbreviations that you do not understand.

Chapter 4 of the COSAL Use and Maintenance Manual provides instructions for using the COSAL. After you have become familiar with the terminology (chapters 1 through 3), refer to chapter 4 for further instructions and sample problems.

To be of maximum use to you, the COSAL must be kept up-to-date at all times. Anytime you use the COSAL, check to be sure it is up-to-date. In the following paragraphs we will discuss the use of the COSAL according to SPCCINST 4441.170, the COSAL Use and Maintenance Manual.

METHODS OF ENTRY.- You may enter the COSAL by any of the following methods:

- By the name of the equipment/component or equipage-use Part I, Section A of the Index
- By the shipboard service application, location, or end use of the equipment/component or equipage-use Part I, Section B of the Index
- By the circuit symbol number (CSN) of the part-use Part II, Section B (microfiche only) to cross-reference the CSN to the NINN/PNICN/TNICN/FSCM/REF. NO. Then use Part II, Section A, to cross-reference the above number to the NSN/PNICN/TNICN
- By the NIIN/part number-use Part III, Section A or B
- By an alternate part number-use Part III, Section D to cross reference alternate numbers to NIIN/PNICN/TNICNs

ORDERING PARTS, TOOLS, AND SUPPLIES

There are numerous supply publications that you should be familiar with to use the supply system to its full capability when you requisition parts and tools. These publications are discussed in Military Requirements for Petty Officer Third Class, NAVEDTRA 12044.

Although the supply department is responsible for supplies, you, the technician, need to know how to identify what is needed, how to write out the request, and how to report on the use of the supplies. The publications containing the stock numbers are kept in the supply department; therefore, to perform your assigned duties, you must cooperate with supply personnel.

SUPPLY REQUISITION FORMS

Documenting material usage and cost data on maintenance transactions requires a joint effort of the ship’s supply and maintenance personnel. NAVSUP Form 1250 and DD Form 1348 (discussed in Military Requirements for Petty Officer Third Class and OPNAVINST 4790.4) are the primary supply documents used by maintenance personnel. They are used to requisition parts and materials and to record material usage and cost data in support of maintenance actions. Normally, maintenance personnel are responsible for filling out and forwarding the supply forms for materials that they need to do their jobs. However, supply personnel will provide assistance whenever difficult or unusual documentation problems arise.

Some ships have automated supply systems; others have manual supply systems.

On a nonautomated ship, when a repair part is needed before a specific maintenance action can be completed, maintenance personnel use NAVSUP Form 1250 to request the issue of the part from the ship’s supply department. Supply personnel issue the part if it is in stock aboard ship. If the part is not in stock supply uses the information on the form to order the part from an off-ship source. Nonautomated ships also use the NAVSUP Form 1250 to request chargeable services.

On an automated ship, when a repair part is required to complete a specific maintenance action, maintenance personnel use DD Form 1348. Chargeable services are also requisitioned on the DD Form 1348.

All submarine forces, automated and nonautomated, use NAVSUP Form 1250-1 as a consumption document. Nonautomated ships of the submarine force use it as a Military Standard
Requisitioning and Issue Procedures (MILSTRIP) requisitioning document for procuring material or services from a submarine tender, submarine base, a combat store ship (AFS), a naval supply center, or the Naval Publications and Forms Center (NPFC) Philadelphia. Submarine tenders and bases use the NAVSUP Form 1250 as an invoice for material supplied to supported units of the submarine forces.

NAVSUP Forms 1250 and 1250-1 were developed to meet two needs: (1) to improve inventory control procedures, and (2) to report consumption under the Maintenance Data System (MDS). Be sure to follow the general instructions given below whenever you prepare a NAVSUP Form 1250 or 1250-1:

1. Use a ball-point pen or typewriter.
2. Annotate each entry in the proper data block.
3. To avoid confusion between the numeral 0 and the letter O, use the communication symbol for zeros, which is 0 with a slash through it from upper right to lower left.

Because of the changing nature of the various forms mentioned in the text that follows, we have not attempted to define the proper procedures for filling them out.

A division supply petty officer determines the material a division requires, then prepares the NAVSUP Form 1250/1250-1. Figure 3-5 shows the NAVSUP 1250/1250-1 with the data that must be provided by the

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**Figure 3-5:** Information supplied by the division representative on NAVSUP Form 1250 or 1250-1.
Figure 3-6.-DD Form 1348; Upper-manual. Lower-mechanical.
division representative at the time the request is submitted for an equipment-related repair part.

**MILITARY STANDARD REQUISITIONING AND ISSUE PROCEDURES (MILSTRIP)**

The DD Form 1348 (fig. 3-6), DOD Single Line Item Requisition System Document, designed to meet MILSTRIP requirements, is discussed in Military Requirements for Petty Officer Third Class, NAVEDTRA 12044. You will be using DD Form 1348s and your ready reference list of codes (NAVSUP Publication 409) as you order the items you need.

Here are a few reminders as you use the forms: Prepare the DD Form 1348 by typewriter or ballpoint pen. Do not use pencil because pencil marks can cause errors when the requisition is processed through mark-sensing equipment at shore activities. In preparing requisitions, you do not need to space the entries within the tic marks printed on the forms, but you must make the entries within the proper data blocks. Remember to use the communication symbol to indicate zero on MILSTRIP requisitions.

The DD Form 1348 requires the same information as the NAVSUP Form 1250 but in a different order.

Most material requirements are requisitioned on DD Form 1348. However, certain items are excluded from MILSTRIP and are ordered on DD Form 1149 (figure 3-7, included here for your review) unless otherwise indicated.

**SERVMART**

A SERVMART is a self-service store operated by a shore supply activity and is stocked with items frequently required by most departments. Most SERVMARTs prepare a shopping guide that lists the items carried in the SERVMART. Also, most SERVMARTs provide a shopping list on which you can write the names of items you want.

The use of standard forms such as a DD 1149 may be required at certain supply activities, while at others no listing of items is required.

If a DD form 1348 is required, make up your shopping list; then prepare the DD Form 1348. The money value limit for the shopping list and the authorized signature are entered in the “Remarks” portion of the requisition. The money limit shown is equal to the total amount of the supporting shopping list, plus an additional 10 percent to allow for price...
Figure 3-8.—SERVMART shopping list and covering DD Form 1348.

variations. Figure 3-8 shows a sample shopping list and an MVO (money-value-only) requisition.

At some SERVMARTs “credit cards” are used. These cards are issued to activities frequently using the SERVMART and satisfy the same requirement as the DD Form 1348, thereby eliminating the need for this MVO requisition.

MASTER REPAIRABLE ITEM LIST (MRIL)

The MRIL is a consolidation of many individual repair lists that have been developed to make it easier to identify and return mandatory turn-in items. The MRIL is published every month. The MRIL shown in figure 3-9 is divided into two basic parts.

- Part 1—Listing of Items
- Part 2—Shipping Addresses

Materials assigned cognizance codes E, R, and V are not included in the MRIL. Repairable items in these cognizance codes are listed in the Master Repair List of Navy Aeronautical Materials.

MANDATORY TURN-IN ITEMS

You should already be familiar with the basic description of the mandatory turn-in repairable program from completing Military Requirements for Petty Officer Third Class, NAVEDTRA 12044. The knowledge you have should enable you to answer the following questions concerning the turn-in system:
Why should the item(s) be turned in?

Is there special material content?

Is there hazardous material content?

Is the item a depot level repairable?

Mandatory turn-in repairable can be identified by the material control codes H, E, X, G, or O located in the third position of the item’s NSN.

For the program to work as intended, you must return repairable items promptly and in repairable condition. At the time you present your request for a mandatory turn-in item, supply must inform you that the removed part must be returned. Therefore, when you receive the replacement you are required to do the following:

- Remove the defective item without damaging it beyond its already defective condition.
- Provide adequate protection to the item so it will not be further damaged before it is turned in to supply. The most effective way, if at all possible, is to place the defective part in the same container in which you received the replacement part.
- Resist the temptation to cannibalize the item for components that you might possibly use sometime in the future.

Return the defective item to supply as soon as practical.

Sometimes the needed replacement item is not in the storeroom; supply must obtain it. Normally, you should still turn in the failed item, even though you have not received the replacement item. This way the failed item can enter the repair cycle and be available for reissue soon.

NOTE: The exception to this requirement is when equipment can still be used under limited operation with the failed part in place until the replacement is received. If this is the case, you MUST obtain a “Remain in Place” certification.

You can find information about the packaging for protection in the technical manual of the equipment involved. You can also obtain additional information from the supply department at your command. They may suggest that you not package the turn-in item because of any inspections required before shipment or they may say their shipping personnel have the necessary materials to package the item properly. There are two references that you should know about if supply department personnel are not readily available to assist you. They are the Afloat Supply Procedures, NAVSUP Publication 485; and Supply Ashore, NAVSUP Publication 1.
You will be responsible for learning as much as possible about the supply system by using the training aids available. Most of the ETs in the fleet don't fully understand the supply system and how it works. Most obtain the desired part by any method handy at the time. You MUST become familiar with the system to receive the best results!

FEDERAL CLASSIFICATION SYSTEM

The Federal Classification System requires that only one identification number be assigned for each item of material. The Federal Classification System includes naming, describing, classifying, and numbering all items carried under centralized inventory control, as well as the publication of catalogs and related identification data. The system is managed by the Defense Logistics Agency (DLA).

MATERIAL CLASSIFICATION

The Defense Supply System contains over 4 million different items. The Navy uses and has interest in over 1.5 million of these items. The Federal Supply Classification (FSC) system is a tool to permit the classification of all items of supply used by the federal government. It provides a common language so one service or agency can use available materials held by another.

The FSC is a commodity classification. Groups and classes have been established for the numerous commodities with emphasis on the items in the supply systems of the military departments.

Examples of commodity groups and class are as follows:

58–Communications Equipment (group)
   5815–Teletype and Facsimile equipment (class)
   5831–Intercoms and Public Address Equipment, Airborne

59–Electrical and Electronic Equipment Components
   5905–Resistors
   5910–Capacitors
   5920–Fuses and Lightning Arresters

61–Electric Wire, Power, and Distribution Equipment
   6110–Electrical Control Equipment
   6135–Batteries, Primary

In the FSC system, most material used by the Navy is assigned a national stock number (NSN). The national stock number is a 13-digit number that includes a four-digit FSC number and a nine-digit National Item Identification Number (NIIN). For example, in the NSN 6135-00-385-7281, the FSC number is 6135 and the NIIN is 00-385-7281.

The following NSN, 5920-00-248-5708, preceded by a cognizance material control code, and followed by a special material identification code (SMIC), shows all the elements with which you should be familiar:

N9 H 5920 00 248-5708-VN

Cognizance Symbol N9
Material Control Code H
Federal Supply Group 59
Federal Supply Classification 20
National Codification 00
Bureau (NCB) Code
National Item Identification Number (NIIN) 00-248-5708
Special Material Identification Code (SMIC) VN

Separated, this NSN, cognizance material control code, and SMIC will tell you the following information about the item:

9N = Navy-owned stocks of defense electronic material
H = depot level repairable
59 = electrical and electronic equipment components
20 = fuses and lightning arresters
00= FSNS assigned before 31 March 1975
00-284-5708 = the individual item identification number (NIIN)
VN = electrostatic discharge sensitive material

SEARCHING FOR THE ELUSIVE NSN

Various publications are available to help you find the stock numbers of the parts you want. Afloat, there are four basic publications.
Coordinated Shipboard Allowance List (COSAL)

Afloat Shopping Guide (ASG)

Management List-Navy (ML-N)

Navy Consolidated Master Cross-Reference List (C-MCRL)

Also, many catalogs are published to help you translate your needs to stock numbers. (We will discuss some of these catalogs later in this chapter.) In many cases, the problems of identifying the stock number of an item are much more difficult than those normally encountered by civilian businesses. This complexity has led to the publication of more and more catalogs. As of this writing, a complete set of Navy and federal supply catalogs would occupy some 76 feet of shelf space. Maintaining all these catalogs aboard ship would be difficult, if not impossible. The four basic publications contain enough information to help you identify most of the items you will require.

Afloat Shopping Guide (ASG)

The ASG (NAVSUP P-4400), (explained in Military Requirements for Petty Officer Third Class), is designed to help fleet personnel in identifying the NSN items that are most frequently requested by ships. The ASG is published every 4 years and updated annually; however, you should still use the ML-N for verification of current stock numbers, unit of issue, unit prices, and the like. The format of the ASG is shown in figure 3-10 for review purposes.

General Services Administration (GSA) Catalog

The GSA catalogs nonmilitary items in general use by both military and civil agencies of the United States. The GSA Catalog provides a handy reference in identifying consumable-type material and is similar to the ASG. The material in the GSA Catalog is listed in the ML-N as cognizance symbol 9Q and is carried in stock at stock points under Navy ownership for issue.
NOTE: Not all items in the catalog are suitable for shipboard use.

Management List-Navy (ML-N)

You have read about the ML-N in the Military Requirements for Petty Officer Third Class. The ML-N includes the basic management data for preparing requisitions. Figure 3-11, included here for review, shows the different columns of information and what they contain. The introduction (first fiche-first frames) to the ML-N lists all the codes used and their meanings.

Navy Consolidated Master Cross-Reference List (C-MCRL)

The C-MCRL (fig. 3-12) is a consolidated list of all NSNs items of supply in the Federal Catalog System. It includes many NSNs that are not listed in the ML-N. Therefore, you should exercise caution whenever you
Figure 3-13.—Federal supply code for manufacturers (FSCM): (A) H4-1, name to mfg. code; (B) H42, code to name.

requisition items from the C-MCRL. The C-MCRL is distributed to Navy users semiannually, on microfiche, by the Defense Logistics Services Center (DLSC).

Part 1 of the C-MCRL is a cross-reference between a reference number, an FSCM, and an NSN. Part 2 is a cross-reference between an NSN and a reference number.

Federal Supply Code For Manufacturers (FSCM)

The FSCM provides a five-digit identification number for commercial firms, primarily manufacturers, that supply material to the Department of Defense. It is published in three volumes:

1. H4-1—Manufacturer’s name to manufacturer’s code
2. H4-2—Manufacturer’s code to manufacturer’s name
3. H4-3—Other countries

Figure 3-13, views A and B, show the format and content of H4-1 and H4-2. When you use the C-MCRL to determine an NIIN, you will frequently find the same
reference number listed more than once, with each
listing having a different NIIN. For proper
identification, you must then select the NIIN from the
line entry showing the FSCM for the company that made
the needed part.

The identification lists of the Federal Supply
Catalog include the FSCM in the item descriptions. The
introduction to each section includes a numerical listing
of all FSCMs included in that section.

IDENTIFICATION TO A CURRENT NSN

To obtain required material, you must first find its
current NSN. There are three basic methods of entry you
may use with the catalogs to obtain this information:

1. Entry with an NSN (which may or may not be
current)
2. Entry with a reference number (manufacturer’s
part number, Navy drawing number, or other
reference number)
3. Entry with a noun name and or physical
characteristics description

Entry With NSN

In actual practice, if you already have the NSN, you
just submit the completed requisition to the supply
department.

Entry With Part, Drawing, or Piece Number

A reference number is generally any number, other
than a current NSN, that can be used to identify an item
or to aid in determining the current NSN. Reference
numbers, therefore, include old FSNs, electron tube
numbers, and electronic equipment circuit symbol
numbers. There are, however, two additional important
types of reference numbers that you can convert to
national stock numbers by using the C-MCRL. They are
(1) manufacturer’s part numbers and (2) Navy drawing
and piece numbers.

Manufacturer’s part numbers are numbers assigned
to parts by the manufacturer who designs and builds the
equipment. The manufacturers assign the numbers for
their own use in cataloging and identifying their own
material. Some manufacturers use part number systems
in which their plan or drawing and piece numbers form
all or a portion of their part numbers.

Navy drawing and piece numbers were assigned
originally by Navy technical commands to identify
items in equipment built and or designed by those
commands. Some items may have both manufacturer’s
part numbers and Navy drawing and piece numbers
listed in various reference publications.

When you first try to determine an item’s current
NSN, you will probably look for a manufacturer’s part
number or a Navy drawing and piece number. There are
several possible places to look for such numbers:

1. On an Allowance Parts List (APL).
2. On the part to be replaced. The part number may
be stamped on it.
3. In equipment technical manuals. They may refer
to a manufacturer’s part number or Navy
drawing and piece numbers.
4. On equipment plans. Plans available on the ship
may contain Navy drawing and piece numbers.
5. In EIMB reference data.

Technical manuals, furnished by the manufacturer,
contain a detailed description of equipment and
instructions for its effective use. Normally, the supply
officer does not have technical manuals; they are
maintained and used by the ship’s technicians in
maintaining the complex equipment installed in the
ship. They can serve as a basic source of identification
information for repair parts.

To obtain a current NSN when you know a reference
number, enter the C-MCRL to determine the NIIN.
When the NIIN is listed, check to ensure that the FSCM
coincides with that of the manufacturer of the part.

When the number is listed more than once, you will
need to obtain the manufacturer’s code. When you
obtain the correct NIIN, update your records to reflect
the current stock number.

Entry with Noun Name and or
Physical Description

The third method of obtaining a current NSN
involves beginning the search with a physical
characteristic or noun name description of the item.

There are two different methods of describing an
item other than by the NSN. The first method uses a
physical description of the item and perhaps a
description of its electrical, chemical, and other
properties. (This type of description is similar to that
provided in mail order catalogs.) The second method,
which we covered previously, uses only a reference
number; that is, manufacturer’s part number. Most of the
items in the Navy Supply System are covered only by reference number descriptions because these items are very difficult to describe.

There are, however, many items that you can easily describe by physical characteristics. Included in this category are many common-use items of nontechnical nature, such as paint, handtools, nuts and bolts; and some technical items, such as fuses, resistors, and electron tubes.

You can find the NIIN for a common-use item with a noun name/physical characteristics description in the ASG or GSA catalog. The ASG is sequenced by Federal Supply Groups and Classes. A noun-name-item number index for the ASG is contained in the Introduction and Master Index.

PLANT PROPERTY

Plant property includes all real property (land or buildings and improvements) owned by the Navy or for which the Navy is accountable. This property may be located at either a Navy shore facility or in the plant of a private contractor. Plant property also includes all personal property of a capital nature (equipment) owned by the Navy. Plant property does not include items of equipment in storage (items that are carried) in the Navy Stock Account (NSA) but that have not been issued for end use. Also it does not include items in the custody of a unit of the operating forces that are moved with the unit. As an Electronics Technician carrying out fiscal and supply duties ashore, you may be called upon to perform tasks associated with plant property accounting.

Identification numbers are used with plant property items to make the following functions easier:

- Selection of specific items for transfer
- Physical inventories of equipment
- Maintenance of property record card files
- Specific identification of equipment items in shipment orders, invoices, and survey reports
- Maintenance of history record cards

Each item of equipment meeting the criteria of plant property is marked with an identification or registration number. This number is also recorded on the plant property record card maintained for that item.

Figure 3-14 is an example of an identification tag that you may find on a piece of electronic equipment.

INTEGRATED LOGISTICS REVIEW (ILR)

A ship's ability to perform its operational missions depends to a large extent on the crew's ability to keep the equipment installed on board working as it is designed to work. To do your job as a technician, you must have the proper technical manuals, test equipment, planned maintenance material, and repair parts readily available for use. One of the Navy's efforts to deal with these requirements and to improve each command's readiness is called the Integrated Logistics Review (ILR). Working closely with this program is the Integrated Logistics Overhaul (ILO) program.

The ILO is scheduled to coincide with upgrades during overhaul periods. Under the guidance of an experienced ILO site staff member, called a ship project manager (SPM), a small number of selected personnel from the command aide in overhaul work to provide the command with complete logistics support. This system includes not only repair parts but also technical manuals and PMS materials for the equipment installed during an availability or overhaul.

Integrated logistics support (ILS) audits are performed on commands that have completed installation of new or modified systems and equipments during an overhaul or availability period. The logistics support planned for these alterations includes audits on the accuracy of the allowance parts list (APL), the coordinated shipboard allowance list (COSAL), and allowance appendix pages (APPs). The correct technical manual that coincides with the installed equipment configuration is reviewed. Test equipment required to perform maintenance functions is determined by reviewing maintenance requirement cards (MRCs). The Planned Maintenance System (PMS) documentation audits include verification of the command's list of effective pages (LOEP), maintenance index pages (MIPs), and maintenance requirement cards (MRCs). The adequacy of personnel training is checked. Spare parts are sight validated, as are the command's selected
records and drawings of the newly installed equipment. When the audits are completed, the command will be aware of deficiencies in the total support for the equipment on board. As a technician, you will be assured of the availability of everything necessary for you to maintain your equipment.

As an Electronics Technician, your job is to have your equipment in good repair and ready for action. You also must know how to research the supply publications so you can identify the repair parts you need. You must feed information into the supply system so parts will be available when you need them. Finally you must know how to obtain those parts through the supply system.

As you advance in paygrade and responsibilities, you will become aware that as a technician you are one of many people who make up the repair team. Now is the time for you to work closely with the Storekeepers and learn the supply system so that it will work for you and not delay any of your repair tasks.
APPENDIX I

REFERENCES USED TO DEVELOP THE TRAMAN


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Assignment Questions

**Information:** The text pages that you are to study are provided at the beginning of the assignment questions.
1-1. The EIB contains which of the following types of information?
1. Detailed information on equipment operation
2. Advance information of field changes
3. Procedures concerning OPNAVINST 4790.1
4. All of the above

1-2. A DD Form 200 must be submitted when which, if any, of the following actions occurs?
1. Installation
2. Theft
3. Modification
4. None of the above

1-3. Which of the following references is used for preparation and submission of CASREPs?
1. NWP-7
2. 3-M manual
3. NWP-3
4. NWP 10-1-10

1-4. Shipboard antenna systems manuals supersede existing specifications.
1. True
2. False

1-5. Which of the following information is in section II of the EIC Master Index?
1. A listing of EIC numbers for electronic test equipment
2. Identification of EIC numbers assigned to equipment
3. A directory of illustrative data by EIC
4. A listing of EIC nomenclature in numerical sequence

1-6. Electromagnetic Radiation Hazards discusses classified data in which of the following publications?
1. Volume I, section one
2. Volume I, section two
3. Volume II, part one
4. Volume II, part two

1-7. What publication discusses procedures and techniques to make high-quality, reliable repairs to state-of-the-art electronic printed circuits and modules?
1. Single Sideband Communications Handbook
2. Mil-HDBK-162
3. Directory of Electronic Equipment
4. 2M Electronic Repair Program

1-8. What publication discusses design and installation criteria applicable to shipboard secure electrical information processing systems?
1. MIL-STD-1310
2. MIL-HDBK-175
3. MIL-STD-1680
4. MIL-STD-162

IN ANSWERING QUESTIONS 1-9 THROUGH 1-14, SELECT THE EIMB HANDBOOK TYPE THAT CONTAINS THE SUBJECT MATTER IDENTIFIED IN THE QUESTION.

1-9. Functional descriptions common to equipment in a basic equipment category.
1. Reference Data
2. EMI Reduction
3. General Maintenance
4. Equipment-Oriented
1-10. Definitions, abbreviations, formulas, and general data concerning electronics.

1. Reference Data
2. EMI Reduction
3. General Maintenance
4. Equipment-Oriented


1. Reference Data
2. EMI Reduction
3. General Maintenance
4. Equipment-Oriented

1-12. Field change identification information for all equipment of a basic equipment category.

1. Reference Data
2. EMI Reduction
3. General Maintenance
4. Equipment-Oriented

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1. Reference Data
2. EMI Reduction
3. General Maintenance
4. Equipment-Oriented

1-14. Routine maintenance concepts, techniques, and procedures.

1. Reference Data
2. EMI Reduction
3. General Maintenance
4. Equipment-Oriented

1-16. Approved standards, techniques and practices for installation of electronics aboard ships.

1. General
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3. Electronic Circuits
4. Test Methods and Practices

1-17. Procedures for testing typical electronic circuits and equipment.

1. General
2. Installation Standards
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4. Test Methods and Practices

1-18. Safety matters and subject index of other handbooks.

1. General
2. Installation Standards
3. Electronic Circuits
4. Test Methods and Practices

1-19. Which chapter in the NSTM covers electronics?

1. 79
2. 300
3. 400
4. 631

1-20. Which of the following sources provide(s) the normal performance information found in maintenance standards handbooks?

1. The log of all test results to date
2. The manufacturer’s technical manual
3. The installing activity’s reference standards summary
4. All of the above
1-21. Which of the following is the best description of the PAL?

1. A ready reference source that lists publications by title
2. A publications standards list of mandatory material that every command must have
3. An index of subject matter and where to find it
4. A list of publication needs of the ship/shore station to which it applies

1-22. The usefulness of the CSMP, PMS, and the entire 3-M systems depends on which of the following factors of the MDS?

1. Accuracy
2. Timeliness
3. Thoroughness
4. Each of the above

1-23. The purpose of the CSMP is to provide the command and workcenter with which of the following management data?

1. Scheduled maintenance actions
2. Current maintenance actions
3. Deferred maintenance actions
4. Completed maintenance actions

1-24. Which of the following statements define(s) a configuration change?

1. Addition or deletion of any new or installed equipment
2. Replacement or exchange of any new or installed equipment
3. Modification, relocation, or accomplishment of any alteration, by directive, of any equipment
4. All of the above

1-25. What form should be used with a ship’s maintenance action form deferring maintenance to be done by an IMA under IMMS?

1. OPNAV 4790/76
2. OPNAV 4790/2P
3. OPNAV 4790/2R
4. OPNAV 4790/2Q

1-26. What form should be used to provide amplifying information relating to a maintenance action reported on a ship’s maintenance action form?

1. OPNAV 4790/CK
2. OPNAV 4790/2K
3. OPNAV 4790/2R
4. OPNAV 4790/2L

1-27. What form must be used to report completed maintenance actions and deferred maintenance actions?

1. OPNAV 4790/2K
2. OPNAV 4790/2P
3. OPNAV 4790/2R
4. OPNAV 4790/2Q

1-28. What form is filled in by computer and contains the same information as the ship’s maintenance action form?

1. OPNAV 4790/CK
2. OPNAV 4790/2R
3. OPNAV 4790/2Q
4. OPNAV 4790/2P

1-29. What form must be used to recommend changes to maintenance requirement cards?

1. OPNAV 4790/2K
2. OPNAV 4790/2R
3. OPNAV 4790/2Q
4. OPNAV 4790/7B

1-30. Which of the following items contains written maintenance procedures?

1. PMS
2. MRC
3. MDS
4. MIP
1-31. Which of the following is one of the major objectives of the MDS?

1. Reporting configuration changes
2. Scheduling corrective maintenance
3. Providing detailed information on MRCs
4. Performing preventive maintenance

1-32. Which of the following documents should you review to find out what test equipment you will need to perform maintenance on newly installed equipment?

1. MRC
2. ILR
3. SPM
4. ILO

1-33. Which of the following is a program that audits commands having completed installations of new or modified systems and equipment during availability or overhaul?

1. PMS
2. ILS
3. APL
4. ILR

1-34. Which of the following is a program that provides logistics support of repair parts, technical manuals, and PMS materials for equipment installed during availability/overhaul?

1. SPM
2. ILO
3. PMS
4. ILR

1-35. Which of the following is a program designed to deal with material requirements and to improve a command’s readiness?

1. PMS
2. ILS
3. SPM
4. ILR

1-36. Which of the following statements describe(s) plant property?

1. Navy-owned and Navy-controlled real and personal property of a capital nature
2. Land, buildings, and improvements of all real property owned by the Navy
3. NSA items not issued and in storage are not included
4. All of the above

1-37. Of the following statements, which apply(ies) to SERVMART?

1. Use of MVO requisitions is not permitted
2. Only DD Form 1348 is authorized
3. It is a self-service store stocked with frequently required items
4. All of the above

1-38. Which of the following forms should be used to requisition items excluded from MILSTRIP?

1. DD Form 1149
2. DD Form 1348
3. NAVSUP 1250
4. SPCC Form 4790

1-39. When you prepare a DD Form 1348, you may use a typewriter, ballpoint pen, or pencil.

1. True
2. False

1-40. There are two different methods of describing an item other than by NSN. One method uses a physical description. Which of the following is the best description of the other method?

1. Manufacturer’s part number
2. Electrical properties
3. Chemical composition
1-41. Which of the following publications are a basic source of identification information for repair parts?

1. EIMBs
2. Technical manuals
3. MSGs
4. GSA catalogs

1-42. Which of the following EIMB handbooks can be used to find manufacturer’s part numbers, Navy drawing numbers, or piece numbers?

1. General
2. Reference Data
3. Installation Standards
4. EMI

1-43. Which of the following publications converts manufacturer’s part numbers, Navy drawing numbers, and piece numbers to NSNs?

1. FSCM
2. GSA
3. C-MCRL
4. ASG

1-44. Which of the following publications is a consolidated list of all NSN items of supply in the Federal Catalog System?

1. C-MCRL
2. ASG
3. ML-N
4. GSA

1-45. Which of the following publications provides an identification number for primary manufacturers of DOD material?

1. C-MCRL
2. ASG
3. ML-N
4. FSCM

1-46. Which of the following is the best description of the ML-N?

1. It includes basic management data for preparing requisitions
2. It includes all NSN codification information
3. It includes requisition submission information and SMIC usage
4. It includes a complete listing of all FSCs and manufacturer’s codes

1-47. The GSA catalog is designed to provide which of the following information?

1. Identification of NSN items most frequently requested by ships
2. Cross-reference of COSAL and C-MCRL items
3. Identification of consumable-type material
4. All of the above

1-48. The ASG is designed to provide which of the following information?

1. Identification of consumable-type material
2. Identification of NSN items most frequently requested by ships
3. Cross-reference of COSAL and C-MCRL items
4. All of the above

IN ANSWERING QUESTIONS 1-49 AND 1-50, USE THE FOLLOWING NSN:

9N H 5920-00-284-5708-VN

1-49. What portion of the NSN is the NIIN?

1. 9N H
2. 00 284-5708
3. 5920
4. 00
1-50. What does the "5920" indicate?
1. Material control code
2. Navy-owned stocks
3. Electrical and electronic fuses and lightning arresters
4. Electrostatic discharge sensitive material

1-51. NSNs are composed of which of the following parts?
1. NCB numbers
2. NIINs
3. FSC numbers
4. All of the above

1-52. The FSC system is a tool to permit classification of all items of supply used by the federal government.
1. True
2. False

1-53. Which of the following information is included as part of the federal classification system?
1. Item naming, description, and classification
2. Item numbering, if carried under centralized inventory control
3. Publication of catalogs and related identification data
4. All of the above

1-54. For which of the following reasons may you NOT want to package a turn-in item before it is delivered to supply?
1. Packaging is not your responsibility
2. Proper packing instructions are controlled by supply
3. Supply is the only department authorized to package an item
4. Item inspection prior to shipment may be required

1-55. What condition must exist for an item to be considered an exception to normal mandatory turn-in procedures?
1. The defective item is further damaged during removal
2. The defective item's original container is not available
3. The defective item is not to be turned in to supply
4. The defective item permits limited operation of equipment

1-56. When you are returning a mandatory turn-in item, you should resist the temptation to cannibalize the item for components.
1. True
2. False

1-57. The third position of a mandatory turn-in repairable's NSN will contain which of the following material control codes?
1. H only
2. Q only
3. G, X, and E only
4. Any of the above

1-58. The MRIL discusses which of the following types of information?
1. Nonautomated procedures for MILSTRIP mandatory turn-in
2. Direct turnover material identification and requisition
3. Consolidation of repair lists to identify and return mandatory turn-in items
4. Consolidation of fill-in procedures for issue and turn-in documentation
1-59. When preparing NAVSUP Forms 1250 and 1250-1, to avoid confusion between the number zero and the alphabetic O, you should take which of the following actions?

1. Use the slashed numeric symbol for zero only
2. Use the lower case alphabetic “o” only
3. Use either the numeric symbol for zero or the lower case alphabetic “o” only
4. Use the word “zero”

1-60. Which of the following is/are the purpose(s) of NAVSUP Forms 1250 and 1250-1?

1. To identify the rate of use on any ship or station
2. To report consumption under MDS and improve inventory control procedures
3. To control the amount issued and to whom it is issued
4. To document the equipment failure-rate down time

1-61. DD Form 1348 is used by maintenance personnel on ships having what type of supply system?

1. Nonautomated
2. Automated
3. Nonautomatic
4. Automatic

1-62. When you have the NIIN/part number, you may enter the COSAL through which of the following sections?

1. Section A or B, Part III
2. Section A, Part II
3. Section D, Part III
4. Section B or C, Part II

1-63. NAVSUP Form 1250 is used by maintenance personnel on ships having what type of supply system?

1. Nonautomated
2. Automated
3. Nonautomatic
4. Automatic

1-64. What document should you look in for information on how to use the COSAL?

1. NAVSEA 0967-LP-008-9000
2. NAVSUP P-4998-A
3. NAVEDTRA 10044
4. SPCCINST 4441.170

1-65. Which of the following is the best description of an APL?

1. A cross-reference from NIIN/PNICN/TNICN to APL
2. A cross-reference from NIIN/PNICN/TNICN to NSN
3. A cross index from NSN to NIIN/PNICN/TNICN
4. A cross-index from APL to NIIN/PNICN/TNICN

1-66. Which of the following information is contained in the COSAL/COSBAL?

1. Repair parts and special tools for overhaul, and repair of onboard equipment
2. Miscellaneous portable items for care and upkeep of the ship
3. Equipment or components required to perform operational assignments
4. All of the above

1-67. The COSAL is used primarily for which of the following reasons?

1. To identify storeroom items and determine equipage
2. To give procedures for storage and issue of repair parts
3. To list equipment's test equipment stowage requirements
4. To provide accountability of all equipment necessary for the mission of the command

1-68. Which of the following sections of the COSAL is/are found on microfiche only?

1. Section D, Part III
2. Section B, Part II
3. Index A, Part I
4. All of the above
1-69. Sections A and B of Part I of the COSAL are set up in which of the following ways?

1. They are basically identical, and are arranged as a cross-reference for SOEAPLs in Part II
2. They are basically identical, and are arranged as a cross-index for APL/AELs in Part II
3. They are not identical, and are arranged as a cross-index for AEL/APLs in Part I
4. They are not identical, and are arranged as a cross-reference for SOEAPLS in Part I

1-70. DLA has cognizance over items of material that are corn-non to what users?

1. All government offices worldwide
2. Military services, but not the civilian world
3. Air Force and Marine Corps personnel
4. Government services, but not the military

1-71. GSA has cognizance over items of material that are common to what users?

1. Aviation and submarine forces
2. Army and Navy supply systems
3. Military and civilian worlds
4. Navy and Coast Guard

1-72. Which of the following organizations are primary stock points for aviation material?

1. MLSFs
2. NADEPs
3. AIMDs
4. INASs

1-73. Stock points devote their primary effort to which of the following actions?

1. Procuring and disposing of material
2. Receiving and storing of material
3. Issuing and shipping of material
4. All of the above

1-74. What is the primary function of an inventory manager?

1. To assure that supply support is at maximum levels
2. To assure that fleet only units are serviced properly
3. To assure the proper balance between parts requirements and assets
4. To assure that stock assets meet new construction requirements

1-75. Which of the following is the best description of NAVSUPSYSCOM?

1. It has cognizance over procurement of materials and services throughout the Department of the Navy
2. It controls contract buying and selling of civilian goods throughout the DOD
3. It inspects the storage and distribution of services on afloat commands and aircraft