

CHAPTER 1

THE GUNNER'S MATE (MISSILES) RATING

This training manual has been prepared to help men of the Navy and of the Naval Reserve meet the occupational qualifications for advancement to Gunner's Mate Missiles 3 & 2. The Gunner's Mate qualifications used as a guide in the preparation of this training manual are those contained in the Manual of Qualifications for Advancement in Rating, NavPers 18068-C. Therefore, the qualifications pertaining to your rating are not reproduced in this training manual. We suggest that you study the latest changes and revisions listed in NavPers 18068-C to get an idea of the scope of the skills and knowledge you must have to advance in rating.

This training manual has been organized in such a way as to give you a systematic understanding of your job. Chapter 2 discusses the fundamental fire control problem presented by a projectile or a guided missile. Chapter 3 introduces you to missiles and rockets and their principles of flight. Chapter 4 covers missile guidance and control techniques. Chapter 5 presents the functional requirements of guided missile launching systems. Chapter 6 combines fire control, guns and missiles, and launching systems into a weapons system. In chapter 7 you will study servomechanisms. Chapter 8 describes the use of hydraulics and pneumatics in missile systems. Chapter 9 describes many of the electrical devices used in launching systems and some of their applications therein. Since you are required to handle explosives and know how to maintain magazines, chapter 10 covers them. A new qualification for the GMM rating - small arms, landing party equipment and demolition - is covered in chapter 11. Chapter 12 includes information about general maintenance, such as maintenance aids and procedures. Chapter 13 reviews common test equipment and some troubleshooting hints. Chapter 14 discusses special test equipment used in keeping launchers in top working order. This chapter also covers several methods of replenishing missile firing ships. Chapter 15, the last chapter in this manual,

tells about the paper work you do and the many sources of information needed to keep your equipment in good operating condition. Many of the publications you must use are classified. Basic Military Requirements, NavPers 10054-C, gave you basic rules for safeguarding classified publications and material that you use in your work.

The remainder of this chapter gives information on the enlisted rating structure, the Gunner's Mate rating, requirements and procedures for advancement in rating, and references that will help you in working for advancement and in performing your duties as a G M. This chapter also includes information on how to use Navy Rate Training Manuals. Therefore, it is strongly recommended that you study this chapter carefully before beginning intensive study of the remainder of this training manual.

THE ENLISTED RATING STRUCTURE

The two main types of ratings in the present enlisted rating structure are general ratings and service ratings.

GENERAL RATINGS identify broad occupational fields of related duties and functions. Some general ratings include service ratings; others do not. Both Regular Navy and Naval Reserve personnel may hold general ratings.

SERVICE RATINGS identify subdivisions or specialties within a general rating. Although service ratings can exist at any petty officer level, they are most common at the PO3 and PO2 levels. Both Regular Navy and Naval Reserve personnel may hold service ratings.

THE GUNNER'S MATE RATING

Prior to the introduction of missiles and rockets into the Navy, the Gunner's Mate rating was covered under the abbreviation of GM. This denoted the general rating to which all

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Gunner's Mates belonged. The GM was the jack-of-all-trades in the ordnance field.

When guided missiles were added to the Navy's arsenal of weapons, the general rating of Gunner's Mate was given the responsibility of maintaining these systems. This action effectively bridged the gap for a period of time. Eventually, however, a decision was made to separate the general rating into three service ratings. One of these is to maintain gun and rocket launching systems and Basic Point Defense Missile System. This rating is designated GMG. Another service rating, GMM, was assigned to maintain missile launching systems. Still another service rating GMT, was established to maintain nuclear weapons, and recently, the ASROC launching group.

The GMT rating is separated from the other two service ratings up through the pay grade of E-9. The remaining two service ratings, GMG and GMM, remain separated up to and including E-7. At the E-8 and E-9 levels they are combined into the general rating of Gunner's Mate (GMCS and GMCM).

This means that the E-7 Gunner's Mate M, in order to advance, must be prepared to maintain conventional gun systems and rocket launching systems. In other words, an E-7 GMM taking an examination for E-8 will be examined on the qualifications expected of the GMG in addition to his own.

The GMM rating can be further subdivided into classes. Each class is assigned a Navy Enlisted Classification (NEC) number. The purpose of these codes is to assist in identifying personnel in a rating when a broad definition (such as GMM) is not enough. Code numbers are assigned to personnel with specialized skills and training. Examples of such codes are GM-0986, assigned to gunner's mates who have graduated from the guided missile launching system Mk 10 maintenance course, and GM-0988 the number given to the GMM who has graduated from the Tartar Mk 13 GMLS and missile maintenance course. A complete list of the codes is found in the Manual of Navy Enlisted Classifications, NavPers 15105 (latest revision).

As a GMM you are responsible for maintaining guided missile launching systems. Also, you must prepare guided missiles for testing, and replace faulty missile components when tests indicate that this should be done. To be effective in these duties, you must have a broad background in many occupational fields.

A GMM must be a mechanic in order to maintain, adjust, and repair machinery such as loaders, rammers, hoists, blast doors, and

magazine doors. You must learn the principles of machines and how to use handtools, gages, measuring instruments, and test equipment.

Another field you must have a thorough knowledge of is electricity. This knowledge is applied in working with electric motors and generators, switchboards, and control panels for the equipment in the launching system.

You must be knowledgeable in the field of electronics. You will make tests and repairs on vacuum tubes, transistors, magnetic amplifiers, and power supplies.

You must be a hydraulic and pneumatic specialist because many units based on hydraulic and pneumatic principles are used in the launching systems you will be assigned to.

GMM BILLETS

GMM is a seagoing rating. This is not to say that GMMs never get duty on the beach. They do. But most of the billets are on combatant ships. These ships range from the small destroyer escort types to the large attack carriers.

Your billet, as you know, is the place or job to which you are assigned. The billets aboard ship to which you may be assigned are in guided missile launching systems. Primarily your billet calls for a man who will assist a senior GMM in the maintenance of a portion of a system. For example, you may work under a GMM2 whose responsibility is to keep the A-side of a launching system in top working order.

We will not give a list of detailed duties that you will perform in a particular billet. But in general we can say that you will be simply an assistant who will work under the direction of a more senior petty officer. If you are a striker, he will supervise your work closely. If you are third class, supervision will be a little less close and you will be allowed to show more initiative in performing your job. Besides the occupational or professional duties, you will have certain military duties, as do all ratings in the Navy. These military duties include the manning of battle stations, watch standing, and other assignments related to the requirements for naval operations, management, and security. This manual is concerned with your occupational and technical duties - NOT your military duties.

YOUR PART IN NAVAL LEADERSHIP

The Navy and Marine Corps have a continuing program of moral leadership and character education to ensure that naval leadership is maintained at a consistently high level. The Navy

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stresses moral responsibility and personal example. In 1963 the Secretary of the Navy reissued General Order 21. The objective of this general order is to revitalize and reemphasize naval leadership in all of its aspects. The three major aspects of naval leadership are:

1. Technical competence
2. Personal example
3. Moral responsibility

As a petty officer you will have an important practical part to play in your shipboard leadership program. You may take charge of a group of strikers. This will put you in a position of leadership. You will have two responsibilities- to accomplish a mission and to take care of your men. The general principles and techniques of leadership are fully discussed in Military Requirements for PO 3 & 2, NavPers 10056-C. However, let's do a little thinking about how you can help to carry out General Order 21 on a day-to-day basis.

Assume for a moment that your mission aboard ship is to maintain a launcher, and you have strikers to assist you. Now a big part of your job is to learn everything you can about the launcher and to pass on your knowledge to your men. Technical competence is a major aspect of good leadership. But being a skilled technician is not enough. You must inspire your strikers to do their work as efficiently as possible.

A national characteristic of the American fighting man is that he wants to know why he is called upon to perform certain tasks. You must explain to your strikers the importance of their work and how it affects the overall fighting efficiency of your ship. Make the smallest mechanical task take on the nobility of a cause. During exercises or drills make them feel they are winning a war, not just turning knobs on equipment. Keep in mind they are the men who will fight by your side in combat. When led with courage, spirit, and intelligence, they will fight as willingly and as efficiently as any fighter in the world. But it is up to you to provide inspiration so that it will seep down to them.

To inspire your strikers and others, you must have a strong moral character. Some of the character traits you can develop by conscientious study and practice are loyalty, integrity, and quiet self-confidence.

Loyalty is one of the most essential factors of leadership. Experienced officers and petty officers say that they would rather have a loyal man who is not an excellent worker than a disloyal

man who does excellent work. Loyalty to the country, to the Navy, to your ship, to your division, to your chief, to your senior petty officer, and to the men who work with and for you-these are the prime requisites of leadership. The surest way to get the respect and loyalty of your men is to be loyal yourself.

Everytime you feel the urge to criticize the handling of your ship's affairs, stop short. You are a part, and an important part, of your ship. How can you expect your strikers to be loyal if you are not?

Deal with your men squarely and honestly. If you do, you will win and hold their respect. Be dependable. This mark of integrity involves keeping promises promptly. A reputation of being a "square shooter" is worth every effort on your part. Help to build this reputation early by not tolerating "gun-decking" or other methods of falsifying reports.

Good leaders have a quiet self-confidence (not an arrogant or cocky manner) based on thorough knowledge of the job and a belief in their own ability. Confidence begets confidence. If you have confidence in yourself, you can inspire confidence in your men.

ADVANCEMENT

Some of the rewards of advancement are easy to see. You get more pay. Your job assignments become more interesting and more challenging. You are regarded with greater respect by officers and enlisted personnel. You enjoy the satisfaction of getting ahead in your chosen Navy career.

But the advantages of advancement are not yours alone. The Navy also profits. Highly trained personnel are essential to the functioning of the Navy. By each advancement, you increase your value to the Navy in two ways. First, you become more valuable as a specialist in your own rating, and second, you become more valuable as a person who can train others and thus make far-reaching contributions to the entire Navy.

HOW TO QUALIFY FOR ADVANCEMENT

What must you do to qualify for advancement? The requirements may change from time to time, but usually you must:

1. Have a certain amount of time in your present grade.

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2. Complete the required military and rating manuals.

3. Demonstrate your ability to perform all the PRACTICAL requirements for advancement by completing the Record of Practical Factors, NavPers 1414/1.

4. Be recommended by your commanding officer, after the petty officers and officers supervising your work have indicated that they consider you capable of performing the duties of the next higher rate.

5. Demonstrate your KNOWLEDGE by passing written examinations on the occupational and military qualification standards for advancement.

Some of these general requirements may be modified in certain ways. Figure 1-1 gives a more detailed view of the requirements for advancement of active duty personnel; figure 1-2 gives this information for inactive duty personnel.

Remember that the qualifications for advancement can change. Check with your division officer or training officer to be sure that you know the most recent qualifications.

Advancement in rating is not automatic. Even though you have met all the requirements, including passing the written examinations, you may not be able to "sew on the crow" or "add a stripe." The number of men in each rate and rating is controlled on a Navywide basis. Therefore, the number of men who may be advanced is limited by the number of vacancies that exist. When the number of men passing the examination exceeds the number of vacancies, some system must be used to determine which men may be advanced and which may not. The system used is the "final multiple" and is a combination of three types of advancement systems.

- Merit rating system
- Personnel testing system
- Longevity, or seniority, system

The Navy's system provides credit performance, knowledge, and seniority, and, while it cannot guarantee that anyone person will be advanced, it does guarantee that all men within a particular rating will have equal advancement opportunity.

The following factors are considered in computing the final multiple:

<u>Factor</u>	<u>Maximum Credit</u>
Examination score	80
Performance factor (Performance evaluation)	50
Length of service (years x 1)	20
Service in pay grade (years x 2)	20
Medals and awards	15
	<u>185</u>

All of the above information (except the examination score) is submitted to the Naval Examining Center with your examination answer sheet. After grading, the examination scores, for those passing, are added to the other factors to arrive at the final multiple; A precedence list, which is based on final multiples, is then prepared for each pay grade within each rating. Advancement authorizations are then issued, beginning at the top of the list, for the number of men needed to fill the existing vacancies.

HOW TO PREPARE FOR ADVANCEMENT

What must you do to prepare for advancement? You must study the qualifications for advancement, work on the practical factors, study the required rate training manuals, and study other material that is required for advancement in your rating. To prepare for advancement, you will need to be familiar with (1) the Qualls Manual, (2) the Record of Practical Factors, (3) a NavPers publication called Bibliography For Advancement Study NavPers 10052, and (4) applicable rate training manuals. The following sections describe them and give you some practical suggestions on how to use them in preparing for advancement.

Qualls Manual

The Manual of Qualifications for Advancement, NavPers 18068-C, gives the minimum occupational and military qualification standards for advancement to each pay grade within each rating. This manual is usually called the "Qualls Manual," and the qualifications themselves are often called "qualls" The qualification standards are of two general types: (1) military qualification

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REQUIREMENTS *	E1 to E2	E2 to E3	#† E3 to E4	#E4 to E5	† E5 to E6	† E6 to E7	† E7 to E8	† E8 to E9
SERVICE	4 mos. service— or comple- tion of	6 mos. as E-2.	6 mos. as E-3	12 mos. as E-4	24 mos. as E-5.	36 mos. as E-6. 8 years total enlisted service.	36 mos as E-7. 8 of 11 years total service must be enlisted.	24 mos. as E-8. 10 of 13 years total service must be enlisted.
SCHOOL	Recruit Training.		Class A for PR3, DT3, PT3, AME 3, HM 3, PN 3, FTB 3, MT 3,			Class B for AGC MUC, MNC. ††		
PRACTICAL FACTORS	Locally prepared check- offs.	Record of Practical Factors, NavPers 1414/1, must be completed for E-3 and all PO advancements.						
PERFORMANCE TEST			Specified ratings must complete applicable performance tests be- fore taking examinations.					
ENLISTED PERFORMANCE EVALUATION	As used by CO when approving advancement.	Counts toward performance factor credit in ad- vancement multiple.						
EXAMINATIONS **	Locally prepared tests.	See below.	Navy-wide examinations required for all PO advancements.				Navy-wide, selection board.	
RATE TRAINING MANUAL (INCLUD- ING MILITARY REQUIREMENTS)		Required for E-3 and all PO advancements unless waived because of school comple- tion, but need not be repeated if identical course has already been completed. See NavPers 10052 (current edition).					Correspondence courses and recommended reading. See NavPers 10052 (current edition).	
AUTHORIZATION	Commanding Officer		Naval Examining Center					

* All advancements require commanding officer's recommendation.

† 1 year obligated service required for E-5 and E-6; 2 years for E-7, E-8 and E-9.

Military leadership exam required for E-4 and E-5. †† Waived for qualified EOD personnel.

** For E-2 to E-3, NAVEXAMCEN exams or locally prepared tests may be used.

Figure 1-1. — Active duty advancement requirements.

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REQUIREMENTS*	E1 to E2	E2 to E3	E3 to E4	E4 to E5	E5 to E6	E6 to E7	E8	E9
TOTAL TIME IN GRADE	4 mos.	6 mos.	6 mos.	12 mos.	24 mos.	36 mos. with total 8 yrs service	36 mos. with total 11 yrs service	24 mos. with total 13 yrs service
TOTAL TRAINING DUTY IN GRADE †	14 days	14 days	14 days	14 days	28 days	42 days	42 days	28 days
PERFORMANCE TESTS	Specified ratings must complete applicable performance tests before taking examination.							
DRILL PARTICIPATION	Satisfactory participation as a member of a drill unit in accordance with BUPERSINST 5400.42 series.							
PRACTICAL FACTORS (INCLUDING MILITARY REQUIREMENTS)	Record of Practical Factors, NavPers 1414/1, must be completed for all advancements.							
RATE TRAINING MANUAL (INCLUDING MILITARY REQUIREMENTS)	Completion of applicable course or courses must be entered in service record.							
EXAMINATION	Standard Exam		Standard Exam required for all PO Advancements. Also pass Military Leadership Exam for E-4 and E-5.				Standard Exam, Selection Board.	
AUTHORIZATION	Commanding Officer		Naval Examining Center					

* Recommendation by commanding officer required for all advancements.

† Active duty periods may be substituted for training duty.

Figure 1-2. — Inactive duty advancement requirements.

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standards and (2) occupational qualification standards.

MILITARY STANDARDS are requirements that apply to all ratings rather than to anyone particular rating. Military requirements for advancement to third class and second class petty officer rates deal with military conduct, naval organization, military justice, security, watch standing, and other subjects which are required of petty officers in all ratings.

OCCUPATIONAL STANDARDS are requirements that are directly related to the work of each rating.

Both the military requirements and the occupational qualification standards are divided into subject matter groups; then, within each subject matter group, they are divided into PRACTICAL FACTORS and KNOWLEDGE FACTORS. Practical factors are things you must be able to DO. Knowledge factors are things you must KNOW in order to perform the duties of your rating.

In most subject matter areas, you will find both practical factor and knowledge factor qualifications. In some subject matter areas, you may find both practical factor and knowledge factor qualifications. In some subject matter areas, you may find only one or the other. It is important to remember that there are some knowledge aspects to all practical factors, and some practical aspects to most knowledge factors. Therefore, even if the QUALS MANUAL indicates that there are no knowledge factors for a given subject matter area, you may still expect to find examination questions dealing with the knowledge aspects of the practical factors listed in that subject matter area.

You are required to pass a Navywide military/leadership examination for E-4 or E-5, as appropriate, before you take the occupational examinations. The military/leadership examinations are administered on a schedule determined by your commanding officer. Candidates are required to pass the applicable military/leadership examination only once. Each of these examinations consists of 100 questions based on information contained in Military Requirements for Petty Officers 3 & 2, Navpers 10056 and other publications listed in Bibliography For Advancement Study, Navpers 10052.

The Navywide occupational examinations for pay grades E-4 and E-5 will contain 150 questions related to occupational areas of your rating.

If you are working for advancement to second class, remember that you may be examined on third class qualifications as well as on second class qualifications.

The Quals Manual is kept current by means of changes. The occupational qualifications for your rating which are covered in this training manual were current at the time the manual was printed. By the time you are studying this manual, however, the quals for your rating may have been changed. Never trust any set of quals until you have checked it against an UP-TO-DATE copy in the Quals Manual.

Record of Practical Factors

Before you can take the service-wide examinations for advancement, there must be an entry in your service record to show that you have qualified in the practical factors of both the military qualifications and the occupational qualifications. The RECORD OF PRACTICAL FACTORS mentioned earlier, is used to keep a record of your practical factor qualifications. This form is available for each rating. The form lists all practical factors, both military and occupational. As you demonstrate your ability to perform each practical factor appropriate entries are made in the DATE and INITIALS columns.

Changes are made periodically to the Manual of Qualifications for Advancement and revised forms of Navpers 1414/1 are provided when necessary. Extra space is allowed on the Record of Practical Factors for entering additional practical factors as they are published in changes to the Quals Manual. The Record of Practical Factors also provides space for recording demonstrated proficiency in skills which are within the general scope of the rating but which are not identified as minimum qualifications for advancement.

Until completed, the NavPers 1414/1 is usually held by your division officer; after completion it is forwarded to the personnel office for insertion in your service record. If you are transferred before qualifying in all practical factors the incomplete form should be forwarded with your service record to your next duty station. You can save yourself a lot of trouble by making sure that this form actually is inserted in your service record before you are transferred. If the form is not in your service record you may be required to start all over again and requalify in the practical factors which have already been checked off.

Navpers 10052

Bibliography For Advancement Study, Navpers 10052 (revised), is a very important publication for any enlisted person preparing for advancement. This bibliography lists required and recommended rate training manuals and other reference material to be used by personnel working for advancement.

NavPers 10052 is revised and issued once each year by the Bureau of Naval Personnel. Each revised edition is identified by a letter following the Navpers number. When using this publication, be SURE that you have the most recent edition.

If extensive changes in qualifications occur in any rating between the annual revisions of NavPers 10052, a supplementary list of study material may be issued in the form of a BuPers Notice. When you are preparing for advancement, check to see whether changes have been made in the qualifications for your rating. If changes have been made, see if a Bupers Notice has been issued to supplement Navpers 1005 for your rating.

The required and recommended references are listed by pay grade in Navpers 10052. If you are working for advancement to third class, study the material that is listed for second class; but remember that you are also responsible for the references listed at the third class level.

In using Navpers 10052 you will notice that some rate training manuals are marked with an asterisk (*). Any manual marked in this way is MANDATORY - that is, it must be completed at the indicated rate level before you can be eligible to take the servicewide examination for advancement. Each mandatory manual may be completed by (1) passing the appropriate enlisted correspondence course that is based on the mandatory training manual; (2) passing locally prepared tests based on the information given in the training manual; or (3) in some cases, successfully completing an appropriate Navy school.

Do not overlook the section of NavPers 10052 which lists the required and recommended references relating to the military qualification standards for advancement. Personnel of ALL ratings must complete the mandatory military requirements training manual for the appropriate rate level before they can be eligible to advance.

The references in NavPers 10052 which are recommended but not mandatory should also be studied carefully. ALL references listed in Navpers 10052 may be used as source material

for the written examinations, at the appropriate rate levels.

Rate Training Manuals

There are two general types of rate training manuals. RATING manuals (such as this one) are prepared for most enlisted ratings. A rating manual gives information that is directly related to the occupational qualifications of ONE rating. SUBJECT MATTER manuals or BASIC manuals give information that applies to more than one rating.

Rate training manuals are revised from time to time to keep them up to date technically. The revision of a rate training manual is identified by a letter following the NavPers number and the letter following this number in the most recent edition of List of Training Manuals and Correspondence Courses, NavPers 10061. (Navpers 10061 is actually a catalog that lists all current training manuals and correspondence courses; you will find this catalog useful in planning your study program.)

Each time a rate training manual is revised, it is brought into conformance with the official publications and directives on which it is based; but during the life of any edition, discrepancies between the manual and the official sources are almost certain to arise because of changes to the latter which are issued in the interim. In the performance of your duties, you should always refer to the appropriate official publication or directive. If the official source is listed in NavPers 10052, the Naval Examining Center uses it as a source of questions in preparing the fleet-wide examinations for advancement. In case of discrepancy between any publications listed in NavPers 10052 for a given rate, the Examining Center will use the most recent material.

Rate training manuals are designed to help you prepare for advancement. The following suggestions may help you to make the best use of this manual and other Navy training publications when you are preparing for advancement.

1. Study the military qualifications and the occupational qualifications for your rating before you study the training manual, and refer to the Qualls frequently as you study. Remember, you are studying the manual primarily in order to meet these qualls.

2. Set up a regular study plan. It will probably be easier for you to stick to a schedule if you can plan to study at the same time each day. If possible, schedule your studying for a time of

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day when you will not have too many interruptions or distractions.

3. Before you begin to study any part of the manual intensively, become familiar with the entire book. Read the preface and the table of contents. Check through the index. Look at the appendixes. Thumb through the book without any particular plan, looking at the illustrations and reading bits here and there as you see things that interest you.

4. Look at the training manual in more detail to see how it is organized. Look at the table of contents again. Then, chapter by chapter, read the introduction, the headings, and the subheadings. This will give you a pretty clear picture of the scope and content of the book. As you look through the book in this way, ask yourself some questions:

- What do I need to learn about this?
- What do I already know about this?
- How is this information related to information given in other chapters?
- How is this information related to the qualifications for advancement?

5. When you have a general idea of what is in the training manual and how it is organized, fill in the details by intensive study. In each study period, try to cover a complete unit- it may be a chapter, a section of a chapter, or a subsection. The amount of material that you can cover at one time will vary. If you know the subject well, or if the material is easy, you can cover quite a lot at one time. Difficult or unfamiliar material will require more study time.

6. In studying anyone unit-chapter, section, or subsection-write down the questions that occur to you. Many people find it helpful to make a written outline of the unit as they study, or at least to write down the most important ideas.

7. As you study, relate the information in the training manual to the knowledge you already have. When you read about a process, a skill, or a situation, try to see how this information ties in with your own past experience.

8. When you have finished studying-a unit, take time out to see what you have learned. Look back over your notes and questions. Maybe some of your questions have been answered, but perhaps you still have some that are not

answered. Without looking at the training manual, write down the main ideas that you have gotten from studying this unit. Don't just quote the book. If you can It give these ideas in your own words, the chances are that you have not really mastered the information.

9. Use enlisted correspondence courses whenever you can. The correspondence courses are based on rate training manuals or on other appropriate texts. As mentioned before, completion of a mandatory rate training manual can be accomplished by passing an enlisted correspondence course based on the rate training manual. You will probably find it helpful to take other correspondence courses as well as those based on mandatory manuals. Taking a correspondence course helps you to master the information given in the training manual, and also helps you see how much you have learned.

10. Think of your future as you study rate training manuals. You are working for advancement to third class or second class right now, but some day you will be working toward higher rates. Anything extra that you can learn now will help you both now and later.

SOURCES OF INFORMATION

Besides training manuals, Navpers 10052 lists official publications on which you may be examined. You should not only study the sections required, but should become as familiar as possible with all publications you use. One of the most useful things you can learn about a subject is how to find out more about it. No single publication can give you all the information you need to perform the duties of your rating. You should learn where to look for accurate, authoritative, up-to-date information on all subjects related to the military requirements for advancement and the occupational qualifications of your rating.

PUBLICATIONS YOU SHOULD KNOW

Some of the publications described here are subject to change or revision from time to time-some at regular intervals, others as the need arises. When using any publication that is subject to change or revision, be sure that 'you have the latest edition. When using any publication that is kept current by means of changes, be sure you have a copy in which all official changes have been made. Studying canceled or obsolete information will not help you to do your work

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to advance in rating; it is likely to be a waste of time, and may even be seriously misleading.

NAVORDSYSCOM Publications

As you might expect, the publication most often referred to in this manual as a source of amplifying information is the Ordnance Pamphlet (OP). OPs are the basic type of technical publications issued by the Naval Ordnance Systems Command (NAVORDSYSCOM). The equipment OP (which is the one you will most generally use) provides detailed instructions on operational theory, physical description of components, installation, maintenance, repair, and safety precautions for each item of ordnance equipment.

The manufacturer's technical manuals furnished with some items of equipment are valuable sources of information on operation, maintenance, and repair.

The OPs needed for your equipment will be aboard. If you feel a need for additional information, you can consult OP 0, the index of all OPs, for the titles and numbers of other publications, and then request them.

INSTRUCTIONS issued by the NAVORDSYSCOM are another source of information referred to in this manual. The purpose of these instructions is to pass out the details concerning the Command's policy in matters of operation and maintenance. The numbering system for the instructions is explained in chapter 15. The ones pertaining to the work of your division are filed in the office and additional copies of some may be kept in the work spaces.

BUPERS Publications

Some of the BUPERS publications that you will need to study or refer to as you prepare for advancement have already been discussed earlier in this chapter. The basic courses, published by BUPERS, will be referred to frequently in the manual. These include:

Basic Electricity, NavPers 10086-B
Basic Electronics, NavPers 10087-C
Fluid Power, NavPers 16193-B
Military Requirements for Petty Officer 3 & 2,
Navpers 10056-C

Blueprint Reading and Sketching, Navpers
10077-C
Basic Machines, NavPers 10624-A
Basic Handtools, Navpers 10085-A

Large changes have been made in some of the revisions so be sure you have the latest revision of each book.

Since you will be working closely with Fire Controlmen and Gunner's Mates (Guns), you may find it useful to consult the rate training manuals prepared for those ratings.

Naval Ship Systems Command (NAVSHIPSYSCOM)

Missile launching systems and missile magazines must be installed and maintained to comply with ship's rules. These are given in NAVSHIPS Technical Manual, consisting of chapters, many of which are in pamphlet form. Use the table of contents to locate a particular chapter, and then use the index at the end of the chapter to find the topic you want.

The electricity used in your division is supplied by the ship, and ship's rules and regulations must be observed. These too, are given in the Technical Manual, along with some detailed instructions on care and repair of components.

TRAINING FILMS

Training films available to naval personnel are a valuable source of supplementary information on many technical subjects. Training films are listed in the United States Navy Film Catalog, NAVAIR 10-1-777 (formerly NAVWEPS 10-1-777-) published in 1969. Copies may be ordered in accordance with the Navy Stock List of publications and Forms, NAVSUP 2002. Monthly supplements to the Film Catalog are distributed to catalog holders.

When selecting a film, note its date of issue listed in the Film Catalog. As you know, procedures sometimes change rapidly. Thus some films become obsolete rapidly. If a film is obsolete only in part, it may sometimes be shown effectively if before or during its showing you carefully point out to trainees the procedures that have changed.