



DEPARTMENT OF TRANSPORTATION  
UNITED STATES COAST GUARD

Address reply to:  
COMMANDANT (PE-4)  
U.S. COAST GUARD  
WASHINGTON, D.C. 20591

ENLISTED RATINGS QUALIFICATIONS MANUAL - 1967  
CG-311

10 NOV 1971

• AMENDMENT NO. 8

1. Purpose. This Amendment publishes changes and additions to the Enlisted Ratings Qualifications Manual - 1967 (CG-311). New or significantly revised instructions are indicated by a star.

2. Action.

a. Remove the following pages:

9, 10, 37, 38, 71, 72, 81, Section 1, pages 1-1 through 1-8.

b. Insert the following pages:

9, 10, 37, 38, 71, 72, 72A, 81, Section 1, pages 1-1 through 1-8B, Section 4, pages 4-18A through 4-18E.

3. Summary of Changes.

a. Page 10 - Changes normal path of advancement to warrant officer for Sonar Technicians to Electronics vice Boatswain.

b. Page 38 - Expands Practical Factors and Examination Factors for advancement in rating as relates to Boating Safety.

c. Page 72 - Establishes requirements for Boating Safety Officer qualification code (DO).

d. Page 81 - Establishes requirements for Enlisted District Staff Inspectors qualification code (DI).

e. Section 1, pages 1-1 through 1-8B - Revises scope and qualifications for advancement in rating to Boatswain's Mate (BM).

f. Section 4, pages 4-18A through 4-18E - establishes scope and qualifications for advancement in rating to Data Processing Technician (DP).

*Joseph R. Steele*  
JOSEPH R. STEELE  
Chief, Office of Personnel

Done  
12-22-71

Distribution (SDL No. 93)

A: a b c d e (3); f h m n o v w (2); remainder (1)

B: g (152); n (45); j (11); l r (6); c (5); e f h k (3); b i m (2);  
d (1); q (1)

C: a d n (2); remainder (1)

D: a b d e f i k l (GTMO and SAN DIEGO only); m q s v w (1)

E: d f g h j o q v y z (1)

F: k (30); a d i l t v (1)



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ENLISTED RATINGS QUALIFICATIONS MANUAL - 1967  
CG-311

17 MAY 1971

• AMENDMENT NO. 7

1. Purpose. This Amendment publishes changes and additions to the Enlisted Ratings Qualifications Manual - 1967 (CG-311). New or significantly revised instructions are indicated by a star (★).

2. Action.

a. Remove the following pages:

11, 12-14, 65 through 68A, Section 7, pages 7-1 through 7-10

b. Insert the following pages:

11, 12-14, 65 through 68A, Section 7, pages 7-1 through 7-10

3. Summary of Changes.

a. Pages 11 and 12-14 - Authorize the commanding officer to assign designators to personnel whose names appear on a published eligibility list for advancement or change in rating with placement above the CUT-OFF. Incorporates provisions of Commandant Notice 1221 dated 25 March 1970, Subject: Enlisted Ratings Qualifications Manual, CG-311.

b. Page 65:

(1) Changes eligibility requirements for Advanced Hospital Corpsman Technician qualification code (02).

(2) Changes requirements for Clinical Laboratory Technician qualification code (03).

(3) Changes title and eligibility requirements for Medical Administrative Technician to Medical Services Technician, qualification code (04).

c. Page 67:

(1) Establishes Advanced Clinical Laboratory Technician qualification code (14) and sets forth eligibility and requirements therefor.

AMEND NO. 7

17 MAY 1971

(2) Establishes Physical and Occupational Therapy Technician qualification code (15) and sets forth eligibility and requirements therefor.

d. Section 7, pages 7-1 through 7-10 - Revises scope and qualifications for advancement in rating for Port Securityman (PS) / Firefighter (FI).



J. L. GATHROP  
Acting Chief, Office of Personnel

Distribution (SDL No. 92)

A: a b c d e (3); f h m n o v w (2); remainder (1)  
B: g (152); n (45); j (11); l (6); c (5); e f h k (3); b i m (2); d (1); q (1)  
C: a d n (2); remainder (1)  
D: a b d e f i k l (GITMO and SAN DIEGO only); m q s v w (1)  
E: d f g h j o q v y z (1)  
F: k (30); a d l i t v (1)



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ENLISTED RATINGS QUALIFICATIONS MANUAL - 1967  
CG-311

24 MAR 1971

. AMENDMENT NO. 6

1. Purpose. This Amendment publishes changes and additions to the Enlisted Ratings Qualifications Manual - 1967 (CG-311). New or significantly revised instructions are indicated by a star (\*).

2. Action.

a. Remove the following pages:

45, 46 and 46A  
1-23 through 1-31  
2-7 through 2-14  
4-27 through 4-34

b. Insert the following pages:

45, 46 and 46A  
1-23 through 1-32  
2-7 through 2-14B  
4-27 through 4-34B

3. Summary of Changes.

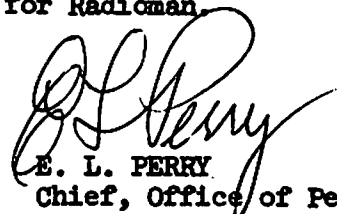
a. Page 45 - Incorporates provisions of COMDTNOTE 1221 dated 5 February 1970 which established Code 37 - Radio Transmitter Equipment, Collins URG-11.

b. Page 46A - Incorporates provisions of COMDTNOTE 1221 dated 8 April 1970 which established eligibility requirements for Amateur Radio Operator code.

c. Group I, pages 1-23 through 1-32 - Revises scope and qualifications for advancement in rating for Sonar Technician.

d. Group II, pages 2-7 through 2-14B - Revises scope and qualifications for advancement in rating for Gunner's Mate.

e. Group IV, pages 4-27 through 4-34B - Revises scope and qualifications for advancement in rating for Radioman.

  
E. L. PERRY  
Chief, Office of Personnel

Distribution (SDL No. 92)

A: a b c d e (3); f h m n o v w (2); remainder (1)

B: g (152); n (45); j (11); l (6); c (5); e f h k (3); b i m (2); d  
(1); q (1)

C: a d n (2); remainder (1)

D: a b d e f i k l (GTO only) m q s v (1)

E: d f g h j o q v y z (1)

F: k (30); a d l i t v (1)



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ENLISTED RATINGS QUALIFICATIONS MANUAL - 1967  
CG-311

1970 JUN 5 09 35 20 MAY 1970

ENLISTED PERSONNEL  
DIVISION

• AMENDMENT NO. 5

1. Purpose. This Amendment publishes changes and additions to the Enlisted Ratings Qualifications Manual - 1967 (CG-311). New or significantly revised instructions are indicated by a star (★).

2. Action.

a. Remove the following pages:

Section 4 - 43, 44, 55 through 64, 67, 68, 9-5 through 9-8E

b. Insert the following pages:

Section 4 - 43, 44, 55 through 64, 67, 68, 68A, 9-5 through 9-8A

c. Make the following changes in ink:

✓ Section 1, page 9 - delete "Lithographer (LI)" under Group IX

✓ Section 1, page 10 - delete "Lithographer" under Personnel Administration

✓ Group IX - Miscellaneous Cover Sheet - delete "Lithographer"

✓ Index - 2 - delete "Lithographer (LI 9-5)"

3. Summary of Changes

a. Section 4, page 43 - revises eligibility requirements for assignment of O2 qualification code to Sonarmen.

b. Section 4, page 56 - establishes coding combinations for Aviation Machinist's Mate.

c. Section 4, page 57 - establishes coding combinations for Aviation Electrician's Mate.

d. Section 4, page 58 - establishes coding combinations for Aviation Structural Mechanic.

Done 7/1  
3-2-70

e. Section 4, page 59 - establishes coding combinations for Aviation Electronics Technician.

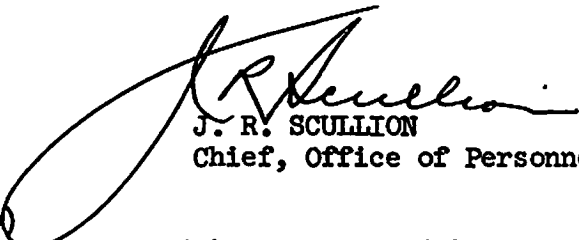
f. Section 4, page 60 - establishes coding combinations for Aviation Survivalman.

g. Section 4, pages 60-61 - establishes revised and additional qualification codes for Aviation Ratings - Special Series.

h. Section 4, page 67 - establishes eligibility requirements for SAR Aircrew Designation of Hospital Corpsman.

i. Section 4, pages 9-5 through 9-8A - revises scope and qualifications for advancement in rating for Marine Science Technician.

j. Group IX - Miscellaneous - Lithographer (LI) rating has been dis-established.



J. R. SCULLION  
Chief, Office of Personnel

Distribution (SDL No. 90)

A: a b c d e (3); f g h m n o v w (2); remainder (1)

B: g (152); n (45); j (11); l (6); c (5); e f h k (3); b i m (2); d (1);  
q (1)

C: a d n (2); remainder (1)

D: a b d e f i k l (GMTO only) m q r s v (1)

E: a d f g h j o q s (Anchorage only) v y z (1)

F: k (30); a d l i t v (1)

Special List 219





DEPARTMENT OF TRANSPORTATION  
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ENLISTED RATINGS QUALIFICATIONS MANUAL  
1967 (CG-311)

Done 6-2-69  
88  
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20591

5 MAY 1969

AMENDMENT NO. 4

1. Purpose. This Amendment publishes changes and additions to the Enlisted Ratings Qualifications Manual - 1967 (CG-311). New or significantly revised instructions are indicated by a star (★).

2. Cancellation. Commandant Notice 1221 dated 22 October 1968, Subj: USCG Enlisted Ratings Qualifications Manual, 1967 (CG-311), is canceled.

3. Action.

✓ a. Remove the following pages:

✓ Section 3, pages 9 and 10.

✓ Section 4, pages 11 and 12-14.

✓ 45/46, 59/60, 63 through 70A, 73/74, 5-52C/5-52D, 8-5 through 8/10.  
Index pages 1 and 2.

✓ b. Insert the following new pages:

Section 3, pages 9 and 10.

Section 4, pages 11 and 12-14.

✓ 45/46, 46A, 59/60, 63 through 70B., 73/74, 74A, 5-52C/5-52D, 9-8A  
through 9-8E.

Correlation Table page A-3.

Index pages 1 and 2.

c. Make the following changes in ink:

✓ Page 21, Typing Performance Test Instructions, add "Marine Science Technician (MST)".

✓ Group VIII - Beach Patrol cover sheet - delete "Coastal Force CF".

✓ Group IX - Miscellaneous cover sheet - add "Marine Science Technician MST".

✓ Page 9-1, Aerographer's Mate (AG). Change "GENERAL RATING" to read "EMERGENCY RATING".

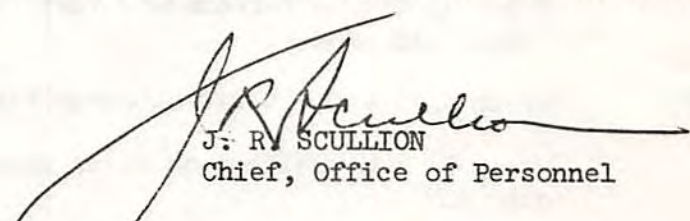
Index page 3, delete "Special Skill Indicators-12".

4. Summary of Changes.

a. Section 3. Name of warrant officer specialties have been corrected and changes made to normal path of advancement.

5 MAY 1969

- b. Section 4. The purpose, assignment and removal of designators have been restated.
- c. Page 45. Codes 22 and 23 deleted.
- d. Page 46. New codes 35 and 36 added. Code 31 deleted.
- e. Page 59. Title of "Aviation Ordnance/Parachute Rigger" changed to read "Aviation Survivalman (ASM)".
- f. Pages 64 and 64A. Qualifications codes for rating of Marine Science Technician added.
- g. Page 67. New code 10 added for rating of Hospital Corpsman. New code 03 added for rating of Dental Technician.
- h. Page 68. New code 02 added.
- i. Page 69. Requirements for Code B5 have been changed.
- j. Page 70. New Codes BA and BB added.
- k. Page 74. Requirements for Code F1 have been changed.
- l. Page 5-52C. The Aviation Survivalman (ASM) scope has been changed by the deletion of the note requiring one premeditated free fall jump under prescribed conditions at PR School.
- m. Group VIII-Beach Patrol. Coastal Forceman (CF) rating has been disestablished.
- n. Page 9-8A through 9-8E adds qualifications for the new rating of Marine Science Technician (MST). The MST rating was established by Commandant Notice 1414 of 22 October 1968, Subj: Establishment of the General Rating of Marine Science Technician (MST).
- o. This Amendment includes a correlation table for the new MST Rating.

  
J. R. SCULLION  
Chief, Office of Personnel

Distribution (SDL No. 88)

A: a b c d e (3); f g h m n o v w (2); remainder (1)  
B: g (152); n (31); j (8); c (5); e f h (3); b i k l m (2); q (1)  
C: a d n (2); remainder (1)  
D: a b d e f i k l (GMTO only) m q r s v (1)  
E: a d f g h j o q s (Boulder City & Anchorage only) v y z (1)  
F: a d h i l t v (1)  
Special List 219



DEPARTMENT OF TRANSPORTATION  
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1967 (CG-311)

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29 August 1968

AMENDMENT NO. 3

1. Purpose. This Amendment publishes E-8 and E-9 qualifications for advancement, qualifications for advancement in the new rating of Aviation Survivalman (ASM), and revisions or additions to previously published information. New or significantly revised instructions are indicated by a star (★).

2. Discussion. The E-8 and E-9 professional qualifications published with this Amendment are effective upon receipt. Candidates for advancement to E-8 and E-9 who expect to compete in the September 1968 Servicewide Examinations are advised, however, that the September examinations will be based on the professional and military examination factors and knowledge aspects of the practical factors presently required for advancement to E-7. Commencing with the March 1969 SWE, separate examinations will be administered to candidates for E-8 and E-9, based upon the professional and military qualifications appropriate to the rate.

3. Action.

a. Remove the following pages:

7/8, 11/12-14, 1-7, 1-17, 1-25/1-26, 1-31, 2-3/2-4, 2-5, 2-13, 3-7, 3-19, 3-29, 3-41, 3-49, 3-59, 3-85, 4-3, 4-13, 4-33, 4-53, 5-17, 5-27, 5-35, 5-57, 9-3, 9-15, 10-5, A-1 through A-22.

b. Insert the following new pages:

Record of Amendments page after Letter of Promulgation.  
Qualification Codes cover sheet between pages 38 and 39.  
7/8, 11/12-14, 1-7/1-8, 1-17, 1-25/1-26, 1-31, 1-39, 2-3/2-4, 2-5/2-6, 2-13/2-14, 3-7/3-8, 3-8A, 3-19/3-20, 3-29/3-30, 3-41/3-42, 3-49/3-50, 3-59/3-60, 3-60A, 3-85/3-86, 4-3/4-4, 4-13, 4-33/4-34, 4-38A, 4-53/4-54, 4-54A, 4-63, 5-17/5-18, 5-27/5-28, 5-35/5-36, 5-42A/5-42B, 5-52A through 5-52K, 5-57/5-58, 5-59, 9-3/9-4, 9-10A 9-15/9-16, 10-5/10-6, 10-11, A-1/A-2.

c. Make the following changes in ink:

Page 72, Code D9, change information in parenthesis in second line to read (WLB, WLM, WLI, WLR, WAK or WAGB-230' class).

Page 0-1 - AIRMAN. Change "SERVICE RATE" to "GENERAL RATE".

Group V - AVIATION Cover Sheet. Add "Aviation Survivalman (ASM)".

Page 5-37 - AVIATION ORDNANCEMAN. Change "GENERAL RATING" to "SERVICE RATING".

Page 5-53 - PARACHUTE RIGGER. Change "GENERAL RATING" to "SERVICE RATING".

Index -1. Under "Aviation Structural Mechanic S" add "AVIATION SURVIVALMAN (ASM) 5-52C".

4. Summary.

a. The E-8 and E-9 qualifications for advancement are published in this Amendment.

b. The new rating of Aviation Survivalman (ASM) is a general rating. The present ratings of Aviation Ordnanceman (AO) and Parachute Rigger (PR) have been reclassified from general ratings to service ratings. Servicewide Examinations for ASM2 through ASMCM will first be administered in March 1969. The ASM rating was established by Commandant Notice 1414 of 10 July 1968 (Subj: Establishment of the General Rating of Aviation Survivalman (ASM)).

c. The Airman rate was activated by Commandant Instruction 1223.5 and is now a general rate.

d. Sonarman (SO) qualifications have been enlarged by the addition of practical factors EL.80, KL.82, and KL.83. All SO1's should be advised of these additional requirements for advancement to SOC and appropriate entries made on their Form CG-3303C-8.

e. Fire Control Technician (FT) practical factor D1.83 has been added as a requirement for advancement to FTC. Practical Factor H1.02 has been made an examination factor and renumbered H2.02. An appropriate entry and deletion should be made of Forms CG-3303C-4 and affected individuals advised.

f. Aviation Electronics Technician (AT) examination factors I2.61 and 2.62 have been downgraded from E-6 to E-4 and are now numbered I2.01 and I2.02. The Examination Information Sheet for AT will be revised accordingly.

g. The Correlation Table contained in Appendix A has been canceled, having served its purpose. New correlation tables for each newly established rating will be published as needed. This Amendment includes a table for the new ASM rating, providing a correlation between the ASM and PR and AO ratings.

  
J. R. SCULLION  
Chief, Office of Personnel

Distribution (SDL No. 87)

- A: a b c d e (3); f g h m n o v w (2); remainder (1)  
B: g(152); n (31); j (8); c (5); e f h (3); i k m (2); b d q (1)  
C: a d n (2); remainder (1)  
D: a b c d e f i k l (GMTO only) m q r s v (1)  
E: a d f g h j o q s (Boulder City & Anchorage only) v y z (1)  
F: a d h i l t v (1)  
Special List 219



DEPARTMENT OF TRANSPORTATION  
UNITED STATES COAST GUARD

ENLISTED RATINGS QUALIFICATIONS MANUAL  
1967 (CG-311)

*Done 7-11-68*  
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WASHINGTON, D.C.  
20591

3 JUN 1968

• AMENDMENT NO. 2

1. Purpose. This Amendment publishes changes and additions to the Enlisted Ratings Qualifications Manual - 1967 (CG-311). New or significantly revised instructions are indicated by a star (★).

2. Action.

a. Remove the following pages:

Section 4, pages 11 through 14.

Pages 39 through 44; 47 and 48; 51 and 52; 61 through 64; 73 and 74; and 79.

Page titled "Aviation - Group V" and pages 5-1 through 5-6.

Page titled "Port Security - Group VII" and pages 7-1 through 7-19.

Page titled "Miscellaneous - Group IX" and pages 9-1 through 9-18.

Index pages 1 through 4

b. Insert the following pages:

Section 4, pages 11 and 12-14.

Pages 39 through 44; 47 and 48; 51 and 52; 61 through 64; 70A; 73 and 74; 79 through 81.

Page titled "Aviation - Group V" and pages 5-1 - 5-5, and 5-6.

Page titled "Port Security - Group VII" and pages 7-1 through 7-10.

Page titled "Miscellaneous - Group IX" and pages 9-1 through 9-22.  
Index pages 1 through 4.

c. Make the following changes in ink:

✓ Page 8, Section 3B, Group V - Aviation - delete "Aerographer's Mate (AG), GR - E-4 - E-9."

✓ Page 9, Section 3B, Group VII - Port Security - delete "Dangerous Cargoman (DG), ER - E-4 - E-9."

✓ Page 9, Section 3B, Group IX - Miscellaneous - add "Aerographer's Mate (AG) GR - E-4 - E-9."

Qualification Codes Section

✓ Page 45, change requirement for Code 05 to read AN/WLR 1/3 ECM (Maintenance)

✓ Page 45, below Code 28 add the following new codes:

29 AN/SPS - 29  
32 MK - 10 IFP  
33 AN/SPA 66  
34 AN/SPA 34

✓ Page 46, below Code 30 add the following new code:

31 AN/WLR 1/3 ECM (Operator)

✓ Page 70, change requirements for Code C5 to read Caterpillar, 333 series.

✓ Page 70, below Code D1 add the following new code:

C9 Caterpillar, 353, 398 series

✓ Page 72, Code D7, second line of Requirements change 25' MCB to read 24' MCB.

✓ Page 72, Code D9, change information in parenthesis in second line to read (WLB, WLM, WLI, WLR, or WAGB-230' class).

3. Summary. Articles or paragraphs which have been modified or added by this Amendment are indicated by a star.

a. Section 4. Special Skill Indicators have been removed and will not be assigned in the future.

b. Page 39, Qualification Codes. Paragraph 1 clarifies the assignment of Qualification Codes on completion of a Class A School. Paragraph 2 changes the requirements for Coast Guard training activities assigning codes.

c. Page 41. Eligibility and requirements for Codes 01, Armorer and 02 Master Armorer have been changed.

d. Page 42. Qualification Codes for Mount Maintenance and Specialized Training have been recoded and new codes added. Code for Demolition man has been changed from 04 to 07. Qualification Codes for rating of Radarman (RD) have been added.

e. Page 42 and 43. Qualification Codes for rating of Sonarman (SO) have been recoded and new codes added.

f. Page 45. Requirements for Code O5 have been changed. New Codes 29, 32, 33 and 34 have been added.

g. Page 46. New Code 31 added.

h. Page 47. Codes O1 and O2 have been amended to permit assignment of codes to Yeomen qualified to perform stenographic and closed microphone reporting duties in Merchant Vessel Investigation sections.

i. Page 52. District commanders may delegate authority to group commanders to assign Code O3.

j. Page 61. New Codes IA, XB, XC, XD, XE and XF added.

k. Page 63. New Codes R7, R8 and R9 added.

l. Page 70. Changes requirement for assigning Code C5 and new Code C9 added.

m. Page 70A. Qualification Codes for officer in charge, small buoy tender, lightship and Coast Guard station have been removed from the Boatswain's Mate (BM) rating and added to Special Series Codes. Code designations have been changed.

n. Page 73. Code E1, Explosive Loading deleted and Code E1 for Explosive Loading - Supervisor substituted. New Code EA for Explosive Loading - Hatch Supervisor has been added.

o. Pages 80 and 81. Codes for Recruiter, Career Information and Counselor, Driving Examiner, Motor Vehicle Operator and Extraordinary Talent have been added.

p. Group V - Aviation, Aerographer's Mate Rating has been removed from the Aviation Group and placed in "Miscellaneous - Group IX."

q. Group VII - Port Security reflects the consolidation of the Dangerous Cargoman (E-4 through E-9) and Firefighter (E-4 through E-5) into the Port Securityman rating. Advancement to Firefighter E-6 through E-9 will be through Port Securityman E-4 and E-5.

  
W. B. ELLIS  
Chief, Office of Personnel

Distribution (SIL No. 86)

A: a b c d e (3); f g h m n o v w (2); remainder (1)

B: g (85); n (31); j (8); c (5); e f h (3); i k m (2); b d q (1)

C: a d n (2); remainder (1)

D: a b c d e f i k l (GTMO only) m q r s v (1)

E: a d f g h i j l m o q s (Boulder City & Anchorage only) u v y z (1)

F: a b c d e f h i l t v w x y (1)

Special List 219





3-11

DEPARTMENT OF TRANSPORTATION  
UNITED STATES COAST GUARD

ENLISTED RATINGS QUALIFICATIONS MANUAL  
1967 (CG-311)

Address reply to:  
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WASHINGTON, D.C.  
20591

14 August 1967

AMENDMENT NO. 1

1. Purpose. This Amendment publishes qualification codes for enlisted ratings and changes to Section 4 A, Designators.

2. Cancellation. Commandant Instruction 1221.1A is hereby canceled.

3. Action.

a. Insert the following pages:

✓ Pages 39 through 79 after last page in Section for MILITARY REQUIREMENTS FOR ENLISTED RATINGS and preceding GENERAL RATES Section.

✓ b. Make the following change in ink:

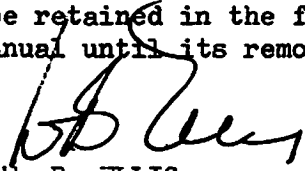
✓ Page 12, Section 4 A, DESIGNATORS. Paragraph 6, Removal of Designator, add the following subparagraph:

✓ "d. The designator shall be removed from the rating of Class "A" school graduates 12 months after assignment of the designator, provided the individual has not been advanced to pay grade E-4 within that period."

4. Summary. This Amendment publishes enlisted qualification codes for ratings presently used in the Coast Guard and sets forth procedures for their assignment and recording in the service record. Addition of a new subparagraph under removal of the designator will authorize commanding officers to remove the designator from the rate of men not considered fit for advancement to pay grade E-4 twelve months after completion of a Coast Guard or Navy Class "A" School.

Done  
10/3/67  
S.A.

5. This transmittal letter will be retained in the front of the Enlisted Ratings Qualifications Manual until its removal is directed.



W. B. ELLIS  
Chief, Office of Personnel

Distribution (SDL No. 85)

A: a b c d e (3); f g h m n o v w (2); remainder (1)  
B: g (152); n (31); j (8); c (5); e f h (3); i k m (2); b d q (1)  
C: a d n (2); remainder (1)  
D: a b c d e f i k l (GTMO only) m r s v (1)  
E: a d f g h i j l m o q s (Boulder City & Anchorage only) u v y z (1)  
F: a b c d e f g h i l t v w x y (1)  
Special List 156



DEPARTMENT OF TRANSPORTATION  
UNITED STATES COAST GUARD

Address reply to:  
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WASHINGTON, D.C.  
20591

. 10 May 1967

LETTER OF PROMULGATION

(CG-311)

1. Purpose. The Enlisted Ratings Qualifications Manual, (CG-311) prescribes the minimum requirements for advancement within the enlisted rate and rating structure of personnel of the Coast Guard.
2. Cancellation. The Enlisted Ratings Qualifications Manual - 1960, is superseded and canceled.
3. Summary
  - a. The entire Enlisted Ratings Qualifications Manual format has been changed with this revision. The format change gives more definite subject matter areas and a different numbering system, which is explained in the Introduction.
  - b. Appendix A contains a Correlation Table which provides a cross-reference between the old and new qualification items.
4. Amendments. Changes to this manual will be made by consecutively numbered amendments which will include reprinted pages when necessary.
5. Effective Date. The Enlisted Ratings Qualifications Manual - 1967 is effective 1 September 1967.

  
W. B. ELLIS  
Chief, Office of Personnel

Distribution (SDL No. 84)

A: a b c d e (3); f g h m n o v w (2); remainder (1)  
B: g (152); n (31); c (5); e f h (3); i k m (2); b d q (1)  
C: a d n (2); remainder (1)  
D: a b c d e f i k l (GPMO only) m r s v (1)  
E: a d f g h i j l m o q s (Boulder City & Anchorage only) u v y z (1)  
F: a b c d e f g h i l t v w x y (1)  
Special List 156

RECORD OF AMENDMENTS

AMENDMENT NUMBER	DATED	ENTERED BY	DATE CORRECTED
1	8-14-67	L Stivalletti	10-3-67
2	6-3-68	L Stivalletti	7-11-68
3	8-29-68	L Stivalletti	8-29-68
4	5-5-69	L Stivalletti	6-2-69
5	5-20-70	L Stivalletti	3-2-71
6	3-24-71	L Stivalletti	4-20-71
7	5-17-71	L Stivalletti	6-8-71
8	11-10-71	L Stivalletti	12-22-71
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# **INTRODUCTION**

## INTRODUCTION

### Section 1

#### A. PURPOSE ✓

1. This manual is published to:

a. Provide minimum professional and military qualification requirements for advancement in rate (Seaman Apprentice to Seaman) or rating (Quartermaster, third class to Quartermaster, second class) for all Coast Guard enlisted personnel.

b. Serve as a basic reference for:

(1) Preparation of training courses, training publications, on-the-job training programs and school curricula.

(2) Development of Coast Guard servicewide advancement in rating examinations.

(3) Assignment and utilization of enlisted personnel.

(4) Enlisted personnel preparing for advancement in rate or rating.

c. Reflect paths of progression for enlisted career fields.

#### B. SCOPE ✓

1. The manual contains information on performance test instructions, military requirements for advancement and professional qualifications for advancement.

2. Professional qualifications and military requirements consist of qualifications (knowledges and abilities) that personnel must possess or acquire for advancement. The military requirements are applicable to all personnel without regard to general rate or rating. Professional qualifications apply to personnel within a given rating or general rate.

#### C. CONCEPTS AND PRINCIPLES OF ADVANCEMENT QUALIFICATIONS ✓

1. Qualifications consist of minimum knowledges and abilities which enlisted personnel must acquire for advancement to successive paygrades within a rating or general rate. For example, all qualifications items established at the second class level (E-5) are a requirement for all E-4's advancing to E-5. This means that when a qualification is established for second class, personnel at the third class level must perform the task or possess the knowledge specified, since this is the only way in which they can advance to second class. The same relationship of grade level to performance level exists throughout the structure. Qualifications do not prescribe work requirements; they only prescribe standards for advancement.

2. Because they are minimum requirements, qualifications do not cover all content of a rating. Some work may be of such complexity that only the most experienced men of a given paygrade can accomplish it; therefore, the work cannot be considered minimum in nature.

3. Qualifications apply to all men in a rating at their respective paygrades. They are based upon minimum essential tasks and knowledges which are required of a majority of men in a given rate. (Here a distinction must be made between "required" and "performed." Although an item may not be performed by the majority of men in a given rate, it might still be required of all of them. Because of other factors such as rotation, transfers, etc., all men must be prepared to perform certain duties or have certain knowledges. Such duties and knowledges are, therefore, proper qualification requirements.) Qualifications consist of those items which are essential prerequisites and minimum for each paygrade.

4. Qualifications are designed to be flexible. They do not restrict or limit the utilization of personnel. Neither do they set limitations as to what rating should perform any given duty or what paygrade is responsible for possessing any particular knowledge. They only outline the tasks and knowledge for which men at each paygrade will be held responsible when attempting to advance to the next higher paygrade. Personnel of any rating or rate may be called upon by proper authority to perform any task or duty, depending upon local circumstances.

5. Another important concept relative to advancement qualifications is "responsibility level." A qualification is graded at the level which has the "responsibility" for the task or knowledge. Generally, the more routine tasks are placed at the third class (E-4) level; those which still may be classed as routine tasks but which require more experience because of increased difficulty are second class (E-5) qualifications; those which are extremely difficult and require long experience and training are reserved for first class (E-6) and chief petty officer (E-7) levels. Those qualifications which call for the direct instruction, supervision, and training of lower rated men in the rating are first class (E-6) and chief petty officer (E-7) level qualifications; and those which call for the general supervision, training, and instruction of the entire rating are at the senior chief petty officer (E-8) and master chief petty officer (E-9) levels. If an item is truly a chief item and so indicated in the qualifications, it does not mean that chiefs only will perform the work or possess the knowledge involved. Third class personnel may be required to perform work covered in chief items because no one at a higher level is available. None of this changes the fact that the item is typical and representative of the chief level of responsibility and that, for advancement purposes, only first class or above will be examined on it.

#### D. QUALIFICATIONS FORMAT - DEFINITIONS ✓

1. Military Requirements and Professional Qualifications for advancement are presented as individual qualifications items. They are divided into Practical Factors and Examination Factors and are grouped under subject matter areas. For each item, the paygrade level responsible is indicated under the "Required for Advancement to" heading.

a. Scope. The Scope of a rating is a brief statement indicating the types of work, equipment, and areas of responsibility of the rating. It defines the kind of work performed by most of the men in the rating. It also indicates significant work requirements, including those which are created by introduction of new weapons and equipment. It reflects current practices.

b. Practical Factors. Practical Factors specify those required skills which can be measured and which are best judged by actual performance; i.e., by demonstrations of use or manipulation of equipment, materials, tools, and knowledge of procedures which are carried out on the job. They are intended to measure knowledge in action over a continuing period of time.

c. Examination Factors. Examination Factors are items which can best be tested through the medium of a written examination. Examination Factors and knowledge aspects of Practical Factors form the basis of questions contained in the servicewide advancement in rating examinations. Inclusion of the word "None" under Examination Factors implies that no knowledge is required in addition to that already implied in the preceding Practical Factors.

d. Paygrades. Paygrades are the levels established by legislation for pay and allowances purposes. These paygrades are designated as follows: master chief petty officer, E-9; senior chief petty officer, E-8; chief petty officer, E-7; petty officer first class, E-6; petty officer second class, E-5; petty officer third class, E-4; seaman, E-3; seaman apprentice, E-2; and seaman recruit, E-1.

2. Numbering System. This system has been adopted to give greater stability to the identification of each qualification item. The numbering system allows gaps between qualifications of one paygrade and the next paygrade so that additional items adopted in revisions can occupy vacant numbers, without generating chain reactions by renumbering items.

#### E. REQUIREMENTS FOR ADVANCEMENT

1. Requirements for the advancement of enlisted personnel are found in the Personnel Manual (CG-207) and Administrative Manual for Coast Guard Reserve (CG-296). Additional information relating to this subject may be contained in Commandant Instructions and Notices. Among the requirements for advancement are these:

a. All candidates for advancement must demonstrate proficiency in assigned duties and, in addition, successfully pass the Examination Factors for military and professional requirements at the appropriate paygrade as a prerequisite to advancement.

b. Enlisted personnel in any paygrade must demonstrate proficiency in the qualifications specified for the next higher paygrade in order to advance. They should maintain and may be required to demonstrate proficiency in qualifications for all lower paygrades.



## Section 2

### A. CHANGES TO PROFESSIONAL AND MILITARY QUALIFICATIONS

It is essential that these qualifications reflect current requirements of Coast Guard operations and that new servicewide technical, operational and procedural developments be included. Changes to qualifications for advancement resulting from technological/administrative developments requiring implementation will be made as necessary. As qualifications become obsolete or new developments require inclusion in the manual, the Commandant (PE) should be informed. Recommendations are solicited for the improvement of content, format or any other aspect of the manual. Individual commands should review qualifications for advancement in rating. Information relative to the above is contained in succeeding subsections.

### B. GUIDELINES FOR CHANGES TO QUALIFICATIONS

Recommendations for qualifications changes should be submitted in accordance with the following guidelines:

1. If the proposed change relates to an existing qualification:
  - a. Identify the qualification to which it relates.
  - b. State the proposed revision and the paygrades to which it applies.
  - c. Give full justification for the necessity of the proposed change.
2. If the proposed change is an entirely new qualification:
  - a. Identify the subject area of the rating to which it relates.
  - b. State the proposed qualification and the paygrades to which it applies.
  - c. Give full justification for the necessity of the proposed qualification.

### C. GUIDELINES FOR RATING PROPOSALS

Proposals to change the enlisted rating structure should include the following information:

1. Guidelines that are General in Nature
  - a. Type of rating (general, service or emergency).
  - b. Title of proposed rating.
  - c. Operational requirements for the new rating and why it is necessary.
  - d. Special personal qualifications needed for the new rating. (Mental, physical, etc.)
  - e. Security requirements for personnel in this rating.
2. Guidelines Pertaining to Occupational Aspects
  - a. Tasks and duties which personnel in this rating will have to perform.
  - b. Length of time it will take for an individual to learn the skills and knowledges required for this rating.

- c. Degree to which levels and skills are increased for each higher paygrade.
- d. Degree to which work requirements might be equitably assigned among the paygrades.
- e. Degree of formal training it will require to learn this rating.
- f. Degree of on-the-job training it will require to learn this rating.
- g. Duties and tasks that will require formal training.
- h. Duties and tasks that will require on-the-job training.
- i. Whether this rating would require a full day's work aboard ship or station.
- j. Whether chief petty officers would be able to supervise the work of the entire rating.

3. Relationship to the Present Rating Structure

- a. Current rating which is most closely related to the proposed new rating.
- b. Why the work of the proposed new rating could not be performed by enlarging the scope of the presently related rating.
- c. Why the work of the proposed new rating could not be performed by personnel identified by a special skill indicator.
- d. Rating currently doing the work of this rating.
- e. Rating group to which the proposed rating would be assigned.
- f. Warrant category to which personnel in the rating would advance.

### Section 3

#### A. ENLISTED RATING STRUCTURE

1. The enlisted rating structure is the primary administrative tool for the general classification, identification and reporting of Coast Guard enlisted personnel requirements and of Coast Guard enlisted personnel; and is the framework for career development of enlisted personnel.

2. The present rating structure is based on the concept of a single, integrated structure applicable to both Regular Coast Guard and the Coast Guard Reserve, which will serve both peacetime and wartime needs and eliminate the need for elaborate expansion and conversion upon mobilization.

3. The enlisted rating structure consists of paths of advancement from E-1 through E-9. For purposes of ready identification, the structure is divided into the following categories:

a. General Ratings: Broad occupational fields encompassing similar duties and functions which require related patterns of aptitudes and qualifications, and which provide paths of advancement for career development. These ratings identify personnel from paygrade E-4 through E-9. They provide the primary means of identifying billet requirements and personnel qualifications and are provided with distinctive rating badges. There are two types of general ratings, those with no subspecialties or service ratings and those with service ratings. Boatswain's Mate is an example of a general rating which contains no service ratings.

b. Service Ratings: Subdivisions, in most cases, of certain general ratings which, by delineating specific areas of qualifications, provide for required specialization in training and utilization of personnel. They are applicable to personnel of both the Regular Coast Guard and Coast Guard Reserve, and the rating badge is the same as that of the general rating with which associated. Electronics Technician is a general rating, but within its scope it contains two service ratings; namely, Electronics Technician, Communications (N) and Electronics Technician, Radar (R) at the E-4 through E-6 paygrades. Service ratings will be used only during mobilization, wartime or when ordered into effect by the Commandant.

c. Emergency Ratings: Reflects qualifications in a civilian skill not utilized in peacetime Coast Guard operations, but needed in wartime. Emergency ratings will be used only during mobilization, wartime or when ordered into effect by the Commandant.

(NOTE: Advancement beyond second class petty officer is not authorized in certain service and emergency ratings. Personnel recommended for advancement beyond second class in those ratings shall be examined for that rating which encompasses their skills and provides for advancement to pay grade E-9. In this connection, personnel must demonstrate ability to meet the requirements of that rating, in all paygrades, up to and including the grade for which being examined.)

d. General Rates: General apprenticeships applicable to paygrades E-1, E-2 and E-3, such as seaman recruit, seaman apprentice or seaman.

The term "rate" is also used to identify personnel occupationally by paygrade. For example, a Boatswain's Mate Third Class (EM3) is a "rate".

B. ENLISTED RATING STRUCTURE TABLE

	<u>TYPE OF RATING</u>	<u>PAYGRADES AUTHORIZED</u>
<b>GROUP I - DECK</b>		
BOATSWAIN'S MATE (BM)	GR	E4-E9
QUARTERMASTER (QM)	GR	E4-E9
<del>Signalman (SM)</del>	<del>GR</del>	<del>E4-E5</del>
RADARMAN (RD)	GR	E4-E9
<del>SONARMAN (SO)</del>	GR	E4-E9
SEAMAN (SN)		E3
SEAMAN APPRENTICE (SA)		E2
SEAMAN RECRUIT (SR)		E1
<b>GROUP II - ORDNANCE</b>		
GUNNER'S MATE (GM)	GR	E4-E9
FIRE CONTROL TECHNICIAN (FT)	GR	E4-E9
TORPEDOMAN'S MATE (TM)	SR	E4-E9
<b>GROUP III - ENGINEERING AND HULL</b>		
DAMAGE CONTROLMAN (DC)	GR	E4-E9
MACHINIST'S MATE (MM)	GR	E4-E9
ENGINEMAN (EN)	GR	E4-E9
ELECTRONICS TECHNICIAN (ET)	GR	E4-E9
Communications (ETN)	SR	E4-E6
Radar (ETR)	SR	E4-E5
ELECTRICIAN'S MATE (EM)	GR	E4-E9
TELEPHONE TECHNICIAN (TT)	GR	E4-E9
Outside (TTO)	SR	E4-E5
Inside (TTI)	SR	E4-E5
BOILERMAN (BT)	GR	E4-E9
MACHINERY REPAIRMAN (MR)	ER	E4-E9
SHIPFITTER (SF)	SR	E6-E9
Metalsmith (SFM)	SR	E4-E5
Pipefitter (SFP)	SR	E4-E5
FIREMAN (FN)		E3
FIREMAN APPRENTICE (FA)		E2
<b>GROUP IV - ADMINISTRATIVE AND CLERICAL</b>		
RADIOMAN (RM)	GR	E4-E9
YEOMAN (YN)	GR	E4-E9
Communications Yeoman (CYN)	SR	E4
PERSONNELMAN (PN)	SR	E4-E9
POSTAL CLERK (PC)	SR	E4-E9
INVESTIGATOR (IV)	ER	E4-E9
INTELLIGENCEMAN (IX)	ER	E4-E9
STOREKEEPER (SK)	GR	E4-E9
Disbursing Clerk (DK)	SR	E4-E5
MACHINE ACCOUNTANT (MA)	SR	E4-E9
JOURNALIST (JO)	GR	E4-E9
COMMISSARYMAN (CS)	GR	E4-E9
SHIPS SERVICEMAN (SH)	SR	E4-E9
STEWARD (SD)	GR	E4-E9
STEWARDSMAN (TN)		E3
STEWARD APPRENTICE (TA)		E2
STEWARD RECRUIT (TR)		E1

B. ENLISTED RATING STRUCTURE TABLE - Continued

	<u>TYPE OF RATING</u>	<u>PAYGRADES AUTHORIZED</u>
<b>GROUP V - AVIATION</b>		
AVIATION MACHINIST'S MATE (AD)	GR	E4-E9
Turbojet Engines (ADJ)	SR	E4-E5
Reciprocating Engines (ADR)	SR	E4-E5
★ AVIATION SURVIVALMAN (ASM)	GR	E4-E9
★ AVIATION ORDNANCEMAN (AO)	SR	E4-E9
AVIATION ELECTRONICS TECHNICIAN (AT)	GR	E4-E9
Communications Equipment (ATN)	SR	E4-E5
Radar (ATR)	SR	E4-E5
AVIATION ELECTRICIAN'S MATE (AE)	GR	E4-E9
AVIATION STRUCTURAL MECHANIC (AM)	GR	E4-E9
Safety Equipment (AME)	SR	E4-E5
Hydraulics (AMH)	SR	E4-E5
Structures (AMS)	SR	E4-E5
★ PARACHUTE RIGGER (PR)	SR	E4-E9
AIR CONTROLMAN (AC)	ER	E4-E9
AVIATION STOREKEEPER (AK)	SR	E4-E5
AIRMAN (AN)		E3
AIRMAN APPRENTICE (AA)		E2
<b>GROUP VI - CONSTRUCTION</b>		
BUILDER (BU)	ER	E6-E9
Heavy (BUH)	ER	E4-E5
Light (BUL)	ER	E4-E5
Concrete (BUR)	ER	E4-E5
ENGINEERING AIDE (EA)	ER	E6-E9
Draftsman (EAD)	ER	E4-E5
Surveyor (EAS)	ER	E4-E5
EQUIPMENT OPERATOR (EO)	ER	E6-E9
Hauling (EOH)	ER	E4-E5
Construction (EON)	ER	E4-E5
STEELWORKER (SW)	ER	E6-E9
Erector (SWE)	ER	E4-E5
Fabricator (SWF)	ER	E4-E5
UTILITIESMAN (UT)	ER	E6-E9
Air Conditioning (UTA)	ER	E4-E5
Boilerman (UTB)	ER	E4-E5
Plumber (UTP)	ER	E4-E5
Water and Sanitation (UTW)	ER	E4-E5
CONSTRUCTION MECHANIC (CM)	ER	E6-E9
Automotive (CMA)	ER	E4-E5
Construction (CMH)	ER	E4-E5
CONSTRUCTIONMAN (CN)		E3
CONSTRUCTION APPRENTICE (CP)		E2

B. ENLISTED RATING STRUCTURE TABLE - Continued

	<u>TYPE OF RATING</u>	<u>PAYGRADES AUTHORIZED</u>
<b>GROUP VII - PORT SECURITY</b>		
PORT SECURITYMAN (PS)	ER	E4-E9
FIRE FIGHTER (FI)	ER	E6-E9
<b>GROUP VIII - BEACH PATROL</b>		
LIGHT PLANE PILOT (APL)	ER	E5-E9
<b>GROUP IX - MISCELLANEOUS</b>		
MARINE SCIENCE TECHNICIAN (MST)	GR	E4-E9
AEROGRAPHER'S MATE (AG)	ER	E4-E9
TRADESMAN (TD)	ER	E4-E9
PHOTOGRAPHER'S MATE (PH)	GR	E4-E9
MUSICIAN (MU)	GR	E5-E9
<b>GROUP X - MEDICAL AND DENTAL</b>		
HOSPITAL CORPSMAN (HM)	GR	E4-E9
DENTAL TECHNICIAN (DT)	GR	E4-E9
HOSPITALMAN (HN)		E3
HOSPITALMAN APPRENTICE (HA)		E2

C. NORMAL PATH OF ADVANCEMENT TO WARRANT OFFICER

BOATSWAIN ✓ (BOSN)

Boatswain's Mate  
Marine Science Technician  
Quartermaster  
Radarman

WEAPONS ✓ (WEPS)

Gunner's Mate  
Fire Control Technician

MATERIAL MAINTENANCE ✓ (MAT)

Aviation Survivalman  
Damage Controlman

AVIATION ENGINEERING ✓ (AVI)

Aviation Machinist's Mate  
Aviation Electrician's Mate  
Aviation Structural Mechanic  
~~Machinery Technician~~  
~~Machinist's Mate~~  
~~Engineman~~  
~~Boilerman~~  
Electrician's Mate

NAVAL ENGINEERING ✓ (ENG)

~~ELECTRICIAN (ELC)~~

MEDICAL ADMINISTRATION ✓ (MED)

Hospital Corpsman  
Dental Technician

FINANCE AND SUPPLY ✓ (FES)

Storekeeper  
~~Commissaryman~~ *Subsistence Specialist*  
~~Steward~~

PERSONNEL ADMINISTRATION ✓ (PERS)

Yeoman

PUBLIC INFORMATION ✓ (INF)

~~Photographer's Mate~~  
~~Journalist~~ *Photographer*

★ ELECTRONICS ✓ (ELC)

Sonar Technician  
Electronics Technician  
Aviation Electronics Technician  
Telephone Technician

COMMUNICATIONS ✓ (COMM)

Radioman

BANDMASTER ✓ (BNDM)

Musician

At such times as warrant officer examinations are announced, personnel who are recommended may request consideration for appointment in any specialty provided the requirements of Section 1 D of the Personnel Manual are met.

## A. DESIGNATORS

1. The purpose of the designator is to insure that personnel are assigned duties commensurate with their respective training.

★ 2. Commanding officers are authorized to assign designators to personnel whose names appear on a published eligibility list for advancement or change in rating with placement above the CUT-OFF on the eligibility list following successful participation in a Servicewide examination. Personnel who have been assigned a designator shall be assigned the duties of the rating for which designated.

3. District commanders and commanding officers shall assign designators to personnel completing Class "A" School in pay grades E-2 and E-3 in the following manner:

a. By commanders of districts to which Coast Guard personnel have been assigned for administrative and personnel accounting purposes while attending Navy schools or other training. This authority may be further delegated by the district commander to the commanding officer of a district unit to which Coast Guard personnel have been assigned for administrative and personnel accounting purposes while undergoing training.

b. By commanding officers of Headquarters units conducting basic petty officer schools.

c. By commanding officers of Naval commands to which Coast Guard Personnel have been assigned for training and which have been designated personnel accounting units.

4. District commanders and commanding officers of Headquarters units may assign designators in cases of reduction to pay grade E-3 or E-2, whether by court-martial or nonjudicial punishment. Assignment of the designator is not mandatory in this instance, but will be effected by the district commander if in his judgment the best interest of the Coast Guard will be served. In cases of reduction by reason of incompetency, the designator will be removed.

5. When a designator is assigned it shall be used integrally with the individual's rating wherever it appears, as follows: SAYN, SNBM, FNDC, EN2BT (note that parentheses are not used).

6. Non petty officers who have been assigned a designator are authorized to wear the markings of their designator in accordance with Uniform Regulations.


★ 7. Removal of a designator.

a. Designators shall be removed when it has been clearly demonstrated that an enlisted person is no longer qualified for the rating for which designated. The same procedures as those for reduction for incompetency shall apply. Removal of a designator is not considered a proper punishment under the Uniform Code of Military Justice except as noted in subparagraph c.



b. A request from the individual concerned for removal of a designator shall be submitted to the Commandant (PE) for action.

c. A designator will not be assigned to personnel in pay grade E-1. Designators assigned to personnel in pay grade E-2 who are reduced to pay grade E-1, for any reason, will be removed. At such time as the individual concerned has been restored to pay grade E-2 or E-3, he may apply to the Commandant (PE) for restoration of his designator.



**PERFORMANCE  
TEST  
INSTRUCTIONS**

PERFORMANCE TEST INSTRUCTIONS

Flashing Light and Semaphore

Quartermaster (QM)

Signalman (SM)

The following procedures will be observed in administering the tests:

1. Practice Period - One complete rehearsal immediately preceding the official test for both flashing light and semaphore is permissible. Messages used for the official test must differ from those used for the rehearsal and must be unknown to the applicant before the test starts.
2. Transmitting -
  - a. All known errors must be corrected.
  - b. Allowable Errors (uncorrected or omitted characters): A total of two errors in transmitting by either flashing light (coded groups) or semaphore will be allowed applicants. Only one error in transmitting by flashing light (plain language) will be allowed.
3. Receiving - A total of two errors in receiving a message sent by either flashing light (coded groups) or semaphore will be allowed applicants. Only one error may be charged in any one word when receiving a plain language message in the semaphore test. Only one error in receiving by flashing light (plain language) will be allowed.

Welding

Damage Controlman (DC)

Shipfitter (SF)

Personnel shall not be allowed to weld on the ship's structure or equipment until they have passed the welding tests. These tests shall be conducted aboard the welder's ship or station. If personnel qualified to judge the quality of the welds are not available, these tests shall be taken at repair activities where competent personnel shall witness and certify that the man is qualified to make a good weld. This information and the date of qualification shall be entered in the individual's service record.

1. Torch Brazing - Torch braze a specimen in accordance with Figure 1. The combinations of tubing and fittings which are to be used are classified as follows:

Nonferrous Class		Ferrous Class	
Tubing	Fittings	Tubing	Fittings
Copper-nickel alloy	Copper-nickel alloy	Steel	Steel
Copper-nickel alloy	Bronze	Copper-nickel alloy	Steel
Copper	Bronze		
Copper	Copper		

a. Operators who are qualified to braze a specific combination of the materials listed above are considered qualified to braze this combination and all other combinations in this same class.

b. After brazing, an exterior examination of the joint shall show a complete ring of filler metal between the tube and the outer ends of the fittings. Surfaces of the specimens shall be free of globules of filler metal. Fillets shall be concave and of minimum practical dimension.

c. The specimens shall be cut as shown in Figure 1. Visual examination of the joints shall show complete penetration of the filler metal throughout at least 75 percent of the circumference of the fittings. Penetration is defined as follows:

The presence of at least a metallic stain of filler metal at the fitting end of the tubing. The stain resulting from the penetration of the flux shall not be considered as penetration. The metallic stain is differentiated from the flux by its color which is grayish white. The flux stain is glossy in appearance.

## 2. Gas Welding Material, Up to and Including 3/4-Inch -

a. This test covers work in horizontal and vertical fixed positions using approved filler metal on piping or tubing of 3/4-inch or less in size. Weld and test assemblies in accordance with Figure 2.

b. After welding and machining, specimens shall be bent in a bending jig having the exact profile illustrated in Figure 3.

c. Specimens shall be forced into the die by a load on the plunger until a 1/32-inch wire cannot be placed between the specimen and any point on the curvature of the male member of the jig of Figure 3. Any specimen in which a crack or opening exists before the bending, or results from the bending, exceeding 1/8-inch measured in any direction, shall be rejected. No elongation data are required.

## 3. Metal Arc Welding Material, Up to and Including 3/4-Inch -

a. This test covers work in vertical, horizontal, and overhead fixed positions using approved electrodes on a weld of 3/4-inch or less in size. Weld assemblies in accordance with Figure 2.

b. After welding and machining, specimens shall be bent in a bending jig having the exact profile illustrated in Figure 3.

c. Specimens shall be forced into the die by a load on the plunger until a 1/32-inch wire cannot be placed between the specimen and any point on the curvature of the male member of the jig of Figure 3. Any specimen in which a crack or opening exists before the bending, or results from the bending, exceeding 1/8-inch measured in any direction, shall be rejected. No elongation data are required.

4. The welding tests described in 1, 2, and 3 are required for advancement in rating.

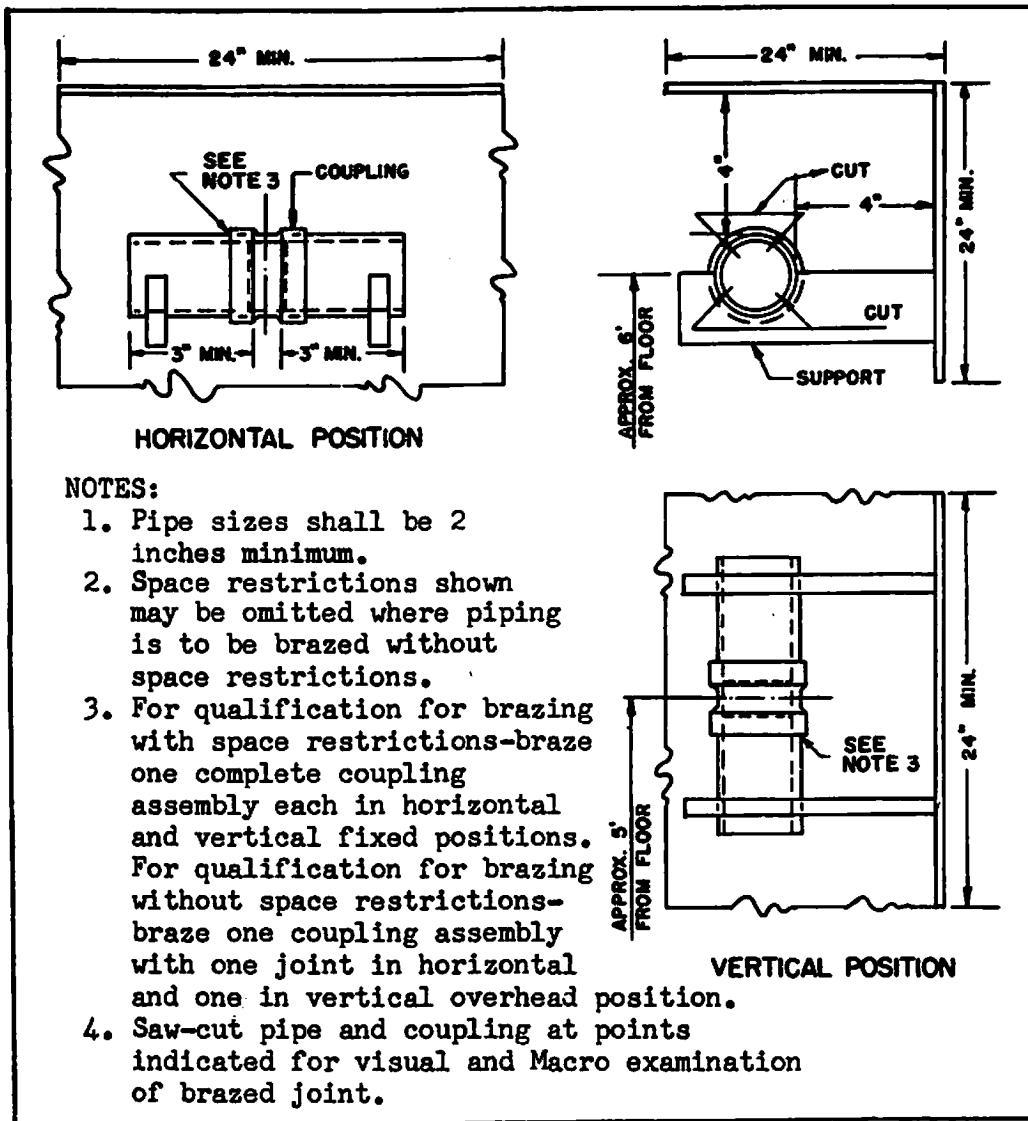
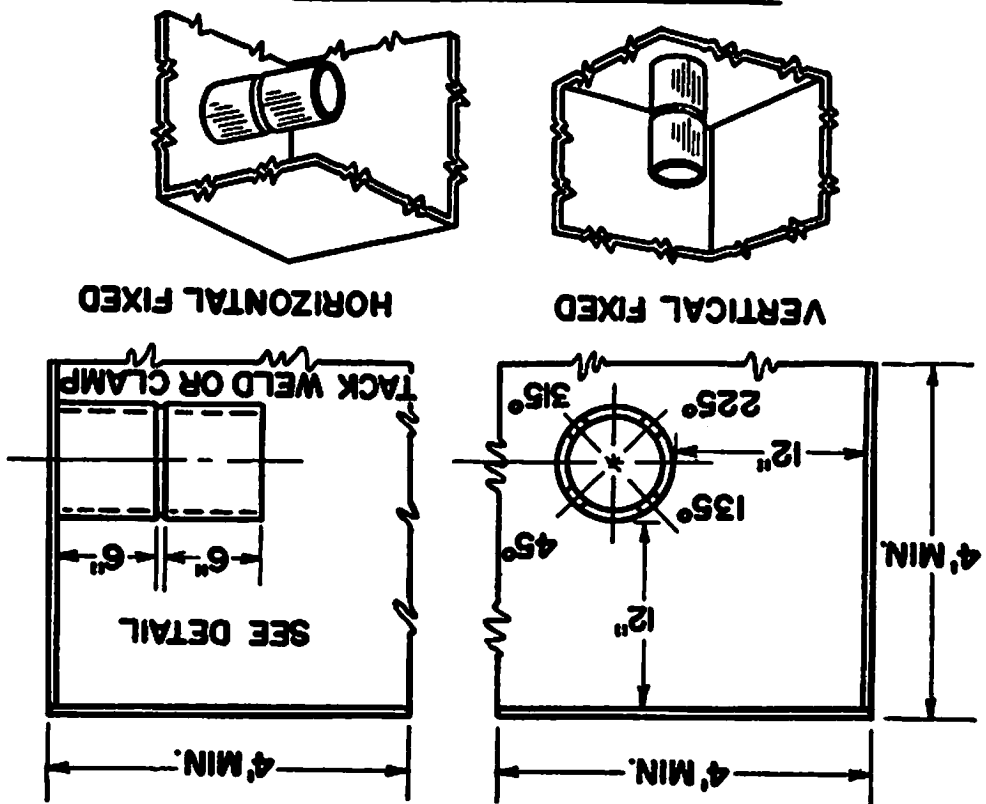
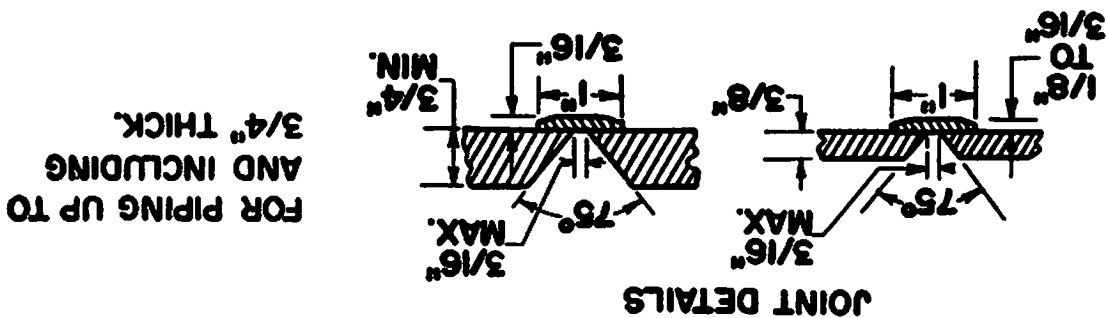
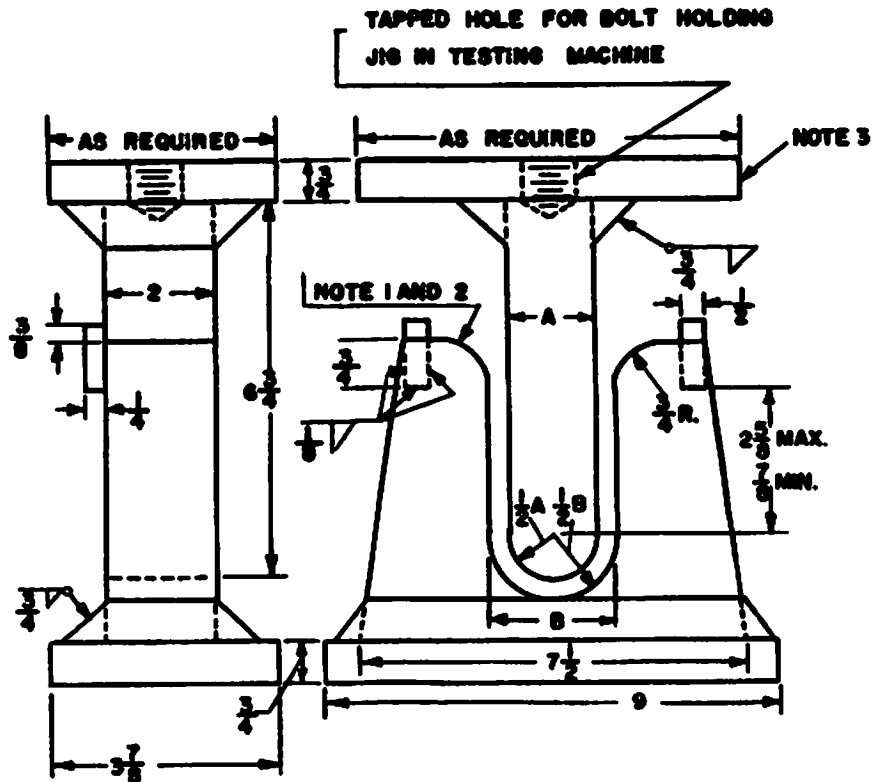


Figure 1. - Qualification test A.

Figure 2. - Qualification tests B and C.

- NOTES:
1. Space restrictions shown may be omitted when welders are to weld piping without space restriction. This limitation shall be entered in the qualification records.
  2. Nominal pipe size shall be 5 inches or larger.
  3. Weld shall be made with the maximum size electrode or welding rod suitable for the position and thickness of test plate.
  4. Welding shall be from one side only.
  5. Mark top and front of pipe to insure location of specimens.
  6. Machine reinforcement and backing ring flush-undercutting shall not be removed.
  7. Specimens may be machined or oxygen-cut from pipe.
  8. Edges of specimens shall be broken to a radius of 1/6 maximum.
- SPECIMENS-
- Face bends from 45 degrees and 225 degrees positions.  
 Root bends from 135 degrees and 315 degrees positions.





SPECIMEN THICKNESS	DIMENSIONS	
	A	B
3/8	1 1/2	2 3/8
T	4T	6T + 1/8
3/8 *	2 1/2	3 3/8
T *	6 2/3 T	6 1/2 T + 1/8

DIMENSIONS ARE IN INCHES  
 \* USE MODIFIED SIZES AS GIVEN  
 FOR ALUMINUM ALLOYS 4043, 5083  
 5356, 5456, 6061, 6053 AND 6063

- NOTES:
1. Either hardened and greased shoulders or hardened rollers free to rotate shall be used.
  2. The shoulders or rollers shall have a minimum bearing surface of 2 inches for placement of the specimen. The rollers or shoulders shall be high enough above the bottom of the jig so that the specimens will clear the rollers when the ram is in the low position.
  3. The ram shall be fitted with an appropriate base and provision for attachment to the testing machine; and shall be designed to minimize deflection and misalignment.

Figure 3. - Jig for guided bend test.

Transmitting and Receiving

Radioman (RM)

Communications Yeoman (CYN)

The following standard procedures will be observed in administering tests:

1. Practice Period - One complete rehearsal immediately preceding the official test for both transmitting and receiving is permissible. Messages used for the official test must differ from those used for the rehearsal and must be unknown to the applicant before the test starts.
2. Transmitting (International Morse and Teletypewriters) -
  - a. All known errors must be corrected.
  - b. Allowable errors (uncorrected or omitted characters) - A total of five errors in transmitting will be permitted in the official test.
  - c. A standard hand key must be used for the International Morse transmitting.
  - d. Use of teletypewriter for teletypewriter transmitting is mandatory, if one is assigned to ship or station.
3. Receiving (International Morse) -
  - a. A total of five errors will be permitted in the official test.
  - b. Receiving shall be done on a telegraphic typewriter.
4. Messages -
  - a. Messages shall be approximately the same length, the heading containing about 30 percent and the text about 70 percent of the total number of characters.
  - b. Of the total number of messages required in the text, one message shall be plain language. The remaining messages shall be composed of 5-letter groups, random mixed letters.
5. Servicing - Time limits for the official test shall include "servicing" each message by endorsing thereon the time of transmission or reception, circuit used, and operator's sign.



Typing

Aerographer's Mate (AG)  
 Aviation Storekeeper (AK)  
 Communications Yeoman (CYN)  
 Dental Technician (DT)  
 Disbursing Clerk (DK)  
 Hospital Corpsman (HM)

Journalist (JO)  
 Personnelman (PN)  
 Postal Clerk (PC)  
 Ship's Serviceman (SH)  
 Storekeeper (SK)  
 Yeoman (YN)

**Marine Science Technician (MST)**

E-4

Tests in typewriting should be given under conditions as nearly similar to working conditions as possible. The following rules are designed to provide examinations which are fair to the candidate and which reflect the requirements of the job.

1. Copy Material - Use unfamiliar, nontechnical material containing approximately 5 numerals to 100 words. The material to be copied should be single spaced and legibly printed, or typewritten in approximately the size of pica or elite typewriter type.

2. Typewriting Rules - Touch typewriting is required except for AG, DT, HM, JO, PC, and SH ratings. The test period shall be 5 minutes. Allow the candidate a 5-minute practice period preceding the test. Use 8 by 10½ inch plain paper. Marginal stops should be set for a line of 65 spaces, and the machine should be set for double spacing. Erasures and blanking or x-ing out of characters are not permitted.

3. Errors - Each character transposed, omitted, or inserted and each word misspelled, incorrectly hyphenated, omitted, or in any way different from the original copy is an error. Errors will not be charged for length of lines in test copy, when differing slightly from the length of lines in original copy. Only one error may be charged in any word. An error in punctuation or spacing is considered an error in the preceding word. Crowding or piling of letters, strikeouts, and faulty shifting are considered errors. Improper indentation is counted in addition to other errors in the line.

4. Grading (net words) - To calculate the net words per minute, count the total number of strokes (spaces within the line as well as characters), divide by 5 to determine the gross number of words, then subtract from the gross number of words 10 words for each error to obtain the number of net words. Divide the net words by the time allowed for the test to determine the net words per minute.

Formula:

$$\frac{\text{Total number of strokes}}{5 \text{ (strokes per word)}} = \text{Gross number of words}$$

$$\frac{\text{Gross words minus 10 words per error}}{\text{Time allowed for test}} = \text{Net words per minute}$$

Typing Table

Net Rate of Speed	Score
Below qualifying rate . . . . .	0
Qualifying rate . . . . .	2.5
Plus 1 - 2 words per minute . . . . .	2.8
Plus 3 - 4 words per minute . . . . .	3.1
Plus 5 - 6 words per minute . . . . .	3.4
Plus 7 - 8 words per minute . . . . .	3.7
Plus 9 or more words per minute . . . . .	4.0

## Stenography

Yeoman (YN)

1. Requirements - Take dictation for 5 minutes at the average rate of speed indicated below. Transcribe dictated material at minimum rate indicated within 50 minutes.

<u>Dictation Rate</u>	<u>Total Number of Words Dictated</u>	<u>Minimum Number of Correctly Transcribed Words*</u>	<u>Minimum Transcription Rate</u>	<u>Required for Advancement to</u>
60 WPM	300	285	6 WPM	YN1
80 WPM	400	380	8 WPM	YNC

\*Note: These represent the minimum requirements based on 95 percent accuracy of the total number of dictated words.

2. Dictation Material - Use unfamiliar, nontechnical material. The test material will be counted in terms of a standard word comprised of 1.4 syllables. In computing words per minute for dictation purposes, the word count will be determined by dividing the number of syllables dictated per minute by the standard syllabic intensity of 1.4. Individual word count of the transcription may be more or less than the rate stipulated above, depending upon the number of syllables in the individual words used in the dictation material.

3. Dictation Rules - Dictate continuously for 5 minutes at the rate specified in 1 above. Dictate a short practice paragraph preceding the test. Dictate the material only once; do not repeat any part. Call the paragraphs and punctuation.

4. Shorthand Method - Any method of shorthand may be used. A machine for the purpose of taking stenographic notes such as stenotype, or closed microphone audio-recording device such as stenomask, is acceptable. It is the candidate's responsibility to arrange for the equipment he intends to use. The equipment may be owned, borrowed, or rented.

5. Transcription Rules - A 5 minute period will be permitted to look over the notes prior to transcription. The transcription period as indicated in 1 above will then begin. Record the completion time when transcription is completed in less time than the maximum time allowed. The use of an English dictionary is permitted during transcription. The transcript shall be typewritten, double-spaced.

6. Grading -

a. Errors: Any modification from the dictated material which changes the meaning or impairs the English is an error. Specific errors include words omitted, inserted, repeated, or transposed; misspelled words, unauthorized abbreviations; changes in tense of verbs, change in number as from singular to plural; and typewriting errors. Deviations from the punctuation and capitalization of the dictated copy are permissible if they conform to accepted usage; however, serious mistakes, such as failure to place a period at the end of a sentence, to capitalize the first letter in a sentence, or to syllabicate properly, are considered errors. An erasure is not an error if it is neatly done. Only one error may be charged to any one word.

b. **Net Words:** To calculate the net words transcribed, count the transcription errors and subtract them from the total number of words dictated. (The net words transcribed of the total amount of words dictated must not be less than 95 percent accurate.)

Net Words = Total words dictated minus transcription errors.

c. **Transcription Rate:** To calculate the rate of transcription, divide the net words transcribed by the time, measured to the nearest quarter minute, required for completion of the transcript. Round off the quotient to the nearest whole number. Fifty minutes is the maximum time allowed for transcription.

$$\frac{\text{Net Words Transcribed}}{\text{Transcription Time}} = \text{Transcription Rate}$$

7. **Marks** - Anyone who either fails to meet the minimum rate transcription or does not attain 95 percent accuracy, regardless of rate, must be disqualified and given a mark of zero in stenography. The mark for any speed and any given number of errors shall be determined in accordance with the table below.

Transcription Table

Net Rate of Speed	Accuracy					
	95%	96%	97%	98%	99%	100%
Below qualifying rate . . . . .	0.0	0.0	0.0	0.0	0.0	0.0
Qualifying rate . . . . .	2.5	2.7	2.9	3.1	3.3	3.5
Plus 1 word a minute . . . . .	2.6	2.8	3.0	3.2	3.4	3.6
Plus 2 words a minute . . . . .	2.7	2.9	3.1	3.3	3.5	3.7
Plus 3 words a minute . . . . .	2.8	3.0	3.2	3.4	3.6	3.8
Plus 4 words a minute . . . . .	2.9	3.1	3.3	3.5	3.7	3.9
Plus 5 or more words a minute . . . . .	3.0	3.2	3.4	3.6	3.8	4.0

Example: A candidate for yeoman, first class, transcribes at a rate of 16 words a minute, which is "5 or more" words a minute above the qualifying rate of 6 words a minute. He has 96 percent accuracy. Therefore, his mark is 3.2.

**MILITARY  
REQUIREMENTS**

**for**

**ENLISTED  
PERSONNEL**



MILITARY REQUIREMENTS

SCOPE

Military requirements are those generally applicable qualifications which all enlisted personnel are expected to demonstrate as a minimum for advancement to specific paygrades. They are applicable to all personnel at the specified paygrade except where indicated for men or women only.

For advancement, enlisted personnel in any paygrade must demonstrate proficiency in the qualifications specified for the next higher paygrade and should maintain, and may be required to demonstrate, qualifications for all lower paygrades.

Note: All male military personnel under 40 years of age on active duty including initial active duty for training are required to meet the minimum physical fitness standards as contained in Chapter 3, Section J, of the Personnel Manual (CG-207). Personnel not meeting these standards are ineligible for advancement.

QUALIFICATIONS FOR ADVANCEMENT

Required for Advancement to

A. CUSTOMS AND COURTESIES

1.00 Practical Factors

- .21 Make hand salutes . . . . . E-2
- .22 Make rifle salutes (Men Only) . . . . . E-2

2.00 Examination Factors

- .21 When and to whom the individual hand and rifle salutes are to be rendered . . . . . E-2
- .22 Military courtesies required of enlisted personnel in the following situations:
  - a. During colors . . . . . E-2
  - b. Boarding or leaving a naval vessel . . . . . E-2
  - c. Crossing or being in the vicinity of the quarterdeck . . . . . E-2
  - d. When in military or civilian dress and the national ensign passes or national anthem is played . . . . . E-2
  - e. When passing, meeting, addressing, introducing, replying to, walking or riding with, any commissioned officer attached to, or serving with, U.S. Armed Forces . . . . . E-2
- .31 Enlisted person's responsibilities when ship and boat passing honors are rendered, and when in the vicinity of a gun salute . . . . . E-3

B. MILITARY CONDUCT

1.00 Practical Factors

None.

2.00 Examination Factors

- .21 Authority of, and services rendered by, military police patrols . . . . . E-2
- .22 Basic content of Articles I through VI of the Code of Conduct for Members of the Armed Forces of the United States . . . . . E-2

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to

B. MILITARY CONDUCT - Continued

2.00 Examination Factors - Continued

- .41 How and when to place personnel on report . . . . . E-4
- .42 General duties of gangway petty officer, guard mail petty officer,  
section leader, master-at-arms, and police petty officer . . . . . E-4
- .43 General duties of military police patrols with respect to apprehension of offenders, contact with officers and contact with civilians . . . . . E-4
- .44 Obligations and responsibilities stipulated by the Code of Conduct . . . . . E-4
- .51 General duties and authority with respect to civilians of a naval landing party in a distressed or disturbed area (Men Only) . . . . . E-5

C. UNIFORM CODE OF MILITARY JUSTICE

1.00 Practical Factors

None.

2.00 Examination Factors

- .21 Purpose of military discipline and punishment . . . . . E-2
- .29 General contents of the following articles of the Uniform Code of Military Justice:
  - a. Commanding officer's nonjudicial punishment (Art. 15) . . . . . E-2
  - b. Compulsory self-incrimination prohibited (Art. 31) . . . . . E-2
  - c. Articles to be explained (Art. 137) . . . . . E-2
  - d. Complaints of wrongs (Art. 138) . . . . . E-3
  - e. Courts-martial classified (types) (Art. 16) . . . . . E-3
  - f. Cruel and unusual punishments prohibited (Art. 55) . . . . . E-3
  - g. Punitive articles:
    - (1) Unauthorized absence (Art. 86) . . . . . E-2
    - (2) Desertion (Art. 85) . . . . . E-2
    - (3) Disrespect toward a superior officer (Art. 89) . . . . . E-2
    - (4) Assaulting or willfully disobeying an officer (Art. 90) . . . . . E-2
    - (5) Insubordinate conduct toward noncommissioned officers (Art. 91) . . . . . E-3
    - (6) Failure to obey orders or regulations (Art. 92) . . . . . E-3
    - (7) Larceny and wrongful appropriation (Art. 121) . . . . . E-3
    - (8) Drunk on duty (Art. 112) . . . . . E-3
    - (9) Missing movement (Art. 87) . . . . . E-3
    - (10) Military property of United States: loss, damage, destruction, or wrongful disposition (Art. 108) . . . . . E-3
    - (11) Drunken or reckless driving (Art. 111) . . . . . E-3
    - (12) Misbehavior of sentinel (Art. 113) . . . . . E-3
    - (13) Assault (Art. 128) . . . . . E-3
    - (14) False official statements (Art. 107) . . . . . E-3
    - (15) Riot or breach of the peace (Art. 116) . . . . . E-3
    - (16) Provoking speeches or gestures (Art. 117) . . . . . E-3
    - (17) General article (Art. 134) . . . . . E-4
    - (18) Principals (Art. 77) . . . . . E-4
    - (19) Accessory after the fact (Art. 78) . . . . . E-4
    - (20) Property other than military property of the United States - waste, spoil, or destruction (Art. 109) . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to

C. UNIFORM CODE OF MILITARY JUSTICE - Continued

2.00 Examination Factors - Continued

- h. Apprehension and restraint (Arts. 7 thru 14) . . . . . E-4
- i. Who may serve on courts-martial (Art. 25) . . . . . E-5
- j. Appointment of trial counsel and defense counsel (Art. 27) . . . . . E-5
- k. Unlawfully influencing action of court (Art. 37) . . . . . E-5
- l. Duties of trial and defense counsel (Art. 38) . . . . . E-6
- m. Redress of injuries to property (Art. 139) . . . . . E-6
- n. Persons subject to the code (Art. 2) . . . . . E-7
- o. Jurisdiction to try certain personnel (Art. 3) . . . . . E-8
- p. Statute of limitations (Art. 43) . . . . . E-8
- q. Investigation (prior to trial by general court-martial) (Art. 32). . . . . E-8
- r. Courts-martial review procedure . . . . . E-9
  - (1) Approval by the convening authority (Art. 64)
  - (2) Disposition of records after review by convening authority (Art. 65)
  - (3) Review by a board of review (Art. 66)
  - (4) Review by the Court of Military Appeals (Art. 67)

D. INTERNATIONAL AGREEMENTS

1.00 Practical Factors

- .81 Explain the general purpose of the Status of Forces Agreements concerning personnel of the Armed Forces in foreign countries . . . . . E-8
- .91 Explain the usual provisions of the Status of Forces Agreements concerning personnel of the Armed Forces in foreign countries . . . . . E-9

2.00 Examination Factors

- .81 Role of the United States Coast Guard in:
  - a. Maritime nature of the free world alliance . . . . . E-8
  - b. Specific major international defense commitments of the United States (SEATO, NATO, and hemisphere defense) . . . . . E-8
  - c. Meeting major world commitments and agreements . . . . . E-8

E. SECURITY REGULATIONS

1.00 Practical Factors

None.

2.00 Examination Factors

- .31 General security regulations concerning personal correspondence and oral communications (Department of the Navy Security Manual for Classified Information, as amended for Coast Guard use). . . . . E-3
- .41 Regulations concerning loss, compromise, and unauthorized disclosure of classified matter . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to

E. SECURITY REGULATIONS - Continued

2.00 Examination Factors - Continued

- .42 Meaning of top secret, secret, confidential, and confidential-  
modified security classifications . . . . . E-4

F. WATCH, QUARTER, AND STATION BILL

1.00 Practical Factors

None.

2.00 Examination Factors

- .31 Purpose of watch, quarter, and station bill . . . . . E-3
- .32 Types of and general information concerning emergency drills . . . . . E-3
- .71 Preparation, revision, and application of a watch, quarter, and  
station bill . . . . . E-7

G. BOAT AND DECK SEAMANSHIP (Men Only)

1.00 Practical Factors

- .31 Locate an object by relative bearing and position angle measured  
in degrees . . . . . E-3
- .32 Perform duties as a member of a boat crew . . . . . E-3

2.00 Examination Factors

- .31 Nomenclature of deck equipment . . . . . E-3
- .32 Difference between true and relative bearings . . . . . E-3
- .41 Boat classes, types, and gear carried; also their nomenclature . . . . . E-4
- .51 General Rules of the Road . . . . . E-5

H. MARLINSPIKE SEAMANSHIP (Men Only)

1.00 Practical Factors

- .31 Tie knots most commonly used. Splice rope (short and long splice).  
Make an eye splice. Put a whipping on a rope; put a stopper and a  
strap on a line; mouse a hook . . . . . E-3

2.00 Examination Factors

- .31 Purpose of most commonly used knots . . . . . E-3

I. DRILL

1.00 Practical Factors

- .21 Execute individual positions and facings used in close-order drill  
with and without arms (Men Only) . . . . . E-2



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to

I. DRILL - Continued

1.00 Practical Factors - Continued

.22 Execute individual positions and facings without arms  
(Women Only) . . . . . E-2

2.00 Examination Factors

.31 Procedures for conducting close-order drill and simple calisthenics. . . E-3

J. UNIFORMS, MEDALS, AND AWARDS

1.00 Practical Factors

.21 Identify rates in paygrades E-1 through E-9 by sleeve insignia . . . . . E-2

.31 Identify the ribbons for the following medals . . . . . E-3

- a. Medal of Honor
- b. Gold Lifesaving Medal
- c. Coast Guard Good Conduct Medal

.39 Identify the following U. S. Coast Guard officer designators:

- a. Rank insignia . . . . . E-3
- b. Warrant line devices . . . . . E-4

2.00 Examination Factors

.21 Regulations for the correct wearing, marking, and exchanging of  
Coast Guard enlisted uniforms . . . . . E-2

.22 Regulations concerning identification tags and identification cards. . . E-2

.31 Regulations for the correct wearing of Coast Guard medals,  
ribbons, and awards . . . . . E-3

.41 Officer and enlisted grades of other branches of U.S. Armed Forces . . . E-4

K. CAREER INFORMATION

1.00 Practical Factors

None.

2.00 Examination Factors

.21 Reasons for, and consequences of, five types of discharges . . . . . E-2

.22 Elementary understanding of the enlisted career structure . . . . . E-2

.31 Periods of enlistment and reenlistment facts . . . . . E-3

.32 General requirements for eligibility for advancement in rate  
and rating . . . . . E-3

.33 Purpose and effect of marks received on Report of Enlisted  
Performance Evaluation Worksheet (CG-3788) . . . . . E-3

.34 Contents of the following sections of the Enlisted Service Record:

- a. Record of Emergency Data . . . . . E-3
- b. Classification, Rating, and Training Sheet . . . . . E-3
- c. Marks Sheet . . . . . E-3

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to

K. CAREER INFORMATION - Continued

2.00 Examination Factors - Continued

- .35 Meaning of accrued, earned, emergency, excess and advance leave, and compensatory absence . . . . . E-3
- .36 Assistance available through the Coast Guard Welfare and the Red Cross . . . . . E-3
- .41 Meaning of basic pay, basic allowance for subsistence and commuted rations . . . . . E-4
- .42 Types of hazardous duty entitling personnel to incentive pay (Men Only) . . . . . E-4
- .43 Purpose of the following:
  - a. Service Schools . . . . . E-4
  - b. Navy training courses . . . . . E-4
  - c. Enlisted correspondence courses . . . . . E-4
  - d. USAFI correspondence courses . . . . . E-4
  - e. USAFI self-study courses . . . . . E-4
- .59 Opportunities for acquiring a commission in the following programs:
  - a. Officer Candidate School . . . . . E-5
  - b. Coast Guard Aviation Cadet Program (Men Only) . . . . . E-5
  - c. Coast Guard Academy (Men Only) . . . . . E-5
  - d. Officer Indoctrination (W) (Women Only) . . . . . E-5
  - e. Warrant Officer Program . . . . . E-6

L. FIRST AID AND PERSONAL HYGIENE

1.00 Practical Factors

- .31 Apply a battle dressing . . . . . E-3
- .32 Demonstrate how to apply immediate treatment for shock . . . . . E-3
- .33 Demonstrate how to control arterial and venous bleeding by compress, finger pressure, and tourniquet . . . . . E-3
- .34 Prepare and apply an improvised splint . . . . . E-3
- .35 Administer artificial respiration by the back-pressure, arm-life method; the back-pressure, hip-lift method; and the mouth-to-mouth method . . . . . E-3
- .36 Transport an injured person by fireman's lift and tied-hands crawl (Men Only) . . . . . E-3

2.00 Examination Factors

- .21 Rules of personal hygiene in relation to body, clothing, bedding, and close living quarters; dangers of self-treatment . . . . . E-2
- .22 Purpose and limitations of first aid . . . . . E-2
- .31 Symptoms of, and immediate treatment for shock . . . . . E-3
- .32 Occasions and precautions for administering a morphine syrette . . . . . E-3
- .33 Classification of burns, symptoms of, and first-aid treatment for each . . . . . E-3
- .34 Procedures for rescuing a person in contact with an energized electrical circuit . . . . . E-3
- .35 Symptoms of, and first-aid treatment for, simple and compound fractures . . . . . E-3

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to

M. SURVIVAL

1.00 Practical Factors

- .21 Enter water feet first from height of 5 feet and swim 50 yards;  
float and tread water . . . . . E-2
- .22 Demonstrate technique for preparing and using clothing and  
buoyant objects for staying afloat. . . . . E-2
- .23 Demonstrate how to put on and use inherently buoyant and CO<sub>2</sub>  
inflatable lifejackets. . . . . E-2
- .24 Demonstrate techniques of swimming through oil, flames, and  
debris (Men Only) . . . . . E-2

2.00 Examination Factors

- .21 Use and care of inherently buoyant and CO<sub>2</sub> inflatable  
life preservers . . . . . E-2
- .31 Preparation for abandoning ship; best ways of going over the side;  
and type of clothing to be taken in abandoning ship in hot or  
cold climate (Men Only) . . . . . E-3
- .41 Use of desalting kit and solar distilling equipment for obtaining  
drinking water; methods of catching and stowing rainwater (Men Only). . . . . E-4
- .42 Use, care, and stowage of the following life float equipment:  
(Men Only)
  - a. Signal mirror, day and night distress signal, and dye marker. . . . . E-4
  - b. First aid kit, rations, and tarpaulin . . . . . E-4

N. SAFETY

1.00 Practical Factors

None.

2.00 Examination Factors

- .21 Safety precautions when embarked in small boats (Men Only). . . . . E-2
- .31 Safety precautions when working aloft or over the side (Men Only) . . . . . E-3
- .32 General safety precautions involved in working with or in the  
vicinity of:
  - a. Tank or closed compartment (Men Only) . . . . . E-3
  - b. Electric and electronic equipment . . . . . E-3
  - c. Machinery and power tools . . . . . E-3
  - d. Fuels, paints, approved cleaning agents, and flammables . . . . . E-3
  - e. Weapons, ammunition, and pyrotechnics (Men Only). . . . . E-3
  - f. Compressed gases (Men Only) . . . . . E-3
  - g. Compressed air (Men Only) . . . . . E-3
  - h. Liquids under pressure (Men Only) . . . . . E-3
  - i. Steam (Men Only). . . . . E-3
  - j. Lifelines, ladders, and scaffolding (Men Only). . . . . E-3
  - k. Heavy weights and moving equipment (Men Only) . . . . . E-3
  - l. Firefighting equipment (Men Only) . . . . . E-3

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to

O. NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) WARFARE DEFENSE

1.00 Practical Factors

- .31 Use NBC warfare defense equipment, including currently issued protective masks, clothing, and self-aid equipment; and adapt regular-issue clothing and equipment for protection against NBC contamination . . . . . E-3
- .32 Act as a member of an NBC decontamination team (Men Only) . . . . . E-3
- .33 Identify standard markers used to denote NBC warfare contamination . . . . . E-3
- .41 Act as a member of a monitoring team, other than monitor (Men Only) . . . . . E-4
- .42 Use a self-reading pocket dosimeter . . . . . E-4
- .51 Use radiac instruments and perform monitoring and surveying operations on surfaces exposed to chemical, biological, and radioactive agents (Men Only) . . . . . E-5
- .61 Supervise an NBC decontamination team and personnel decontamination facility, observing safety precautions (Men Only) . . . . . E-6
- .71 Supervise an NBC monitoring team (Men Only) . . . . . E-7
- .81 Describe procedures to be followed in preparation against attack as set forth in the Nuclear Warfare and Biological and Chemical Warfare defense bills (Men Only) . . . . . E-8

2.00 Examination Factors

- .21 Individual action and precautions to be taken when informed of an imminent NBC warfare attack ashore or afloat . . . . . E-2
- .31 Methods of protection from the following effects of nuclear explosions and self- and first-aid measures for injuries resulting from each:
  - a. Blast . . . . . E-3
  - b. Thermal radiation . . . . . E-3
  - c. Nuclear radiation . . . . . E-3
- .33 General health habits as a protection against biological warfare agents; inroads of infection . . . . . E-3
- .34 Procedures to be followed at a personnel decontamination station, including the removal of clothing . . . . . E-3
- .41 Basic principles of detection of chemical warfare agents . . . . . E-4
- .42 Early symptoms of contamination of personnel exposed to NBC agents . . . . . E-4
- .43 Types of nuclear bursts and their effects . . . . . E-4
- .51 Types and methods of delivery of nuclear, biological, and chemical weapons and agents . . . . . E-5
- .61 Common chemical agents adaptable for use in decontaminating surfaces, equipment, and personnel exposed to NBC agents . . . . . E-6
- .71 Effects of nuclear radiation (Alpha and Beta particles, Gamma rays and neutrons) . . . . . E-7
- .81 Procedures to prevent and/or minimize dangers encountered during NBC warfare, including the control of personnel casualties . . . . . E-8

P. DAMAGE CONTROL

1.00 Practical Factors

- .31 Demonstrate how to extinguish class A, B, C, and D fires . . . . . E-3

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to

**P. DAMAGE CONTROL - Continued**

**2.00 Examination Factors**

- .21 Four classes of fires and their causes, prevention and methods of handling . . . . . E-2
- .31 Material conditions of readiness of a ship. Meanings of W, X, Y, and Z damage control markings (Men Only) . . . . . E-3
- .32 Hazards of fire-produced smoke and fumes . . . . . E-3
- .33 Alarms and calls for fire and collision . . . . . E-3
- .39 Methods of handling and operating:
  - a. Portable CO<sub>2</sub> extinguishers . . . . . E-3
  - b. Hoses, nozzles, and adapters (Men Only) . . . . . E-3
  - c. Safety lines and signals (Men Only) . . . . . E-3
  - d. Oxygen-breathing apparatus (OBA) (Men Only) . . . . . E-3
  - e. Radiation detection instruments (Men Only) . . . . . E-4
- .71 Application of damage control principles to own area of responsibility . . . . . E-7

**Q. SMALL ARMS (Men Only) (Not applicable for Groups X and XI personnel in accordance with 1949 Geneva Convention)**

**1.00 Practical Factors**

- .21 Fire the service rifle, observing safety precautions . . . . . E-2
- .22 Field-strip, clean, and assemble the service rifle . . . . . E-2
- .23 Field-strip, clean, and assemble the service pistol . . . . . E-2
- .24 Fire service pistol, observing safety precautions . . . . . E-2

**2.00 Examination Factors**

- .21 Safety precautions to be observed in handling service rifle . . . . . E-2
- .22 Safety precautions to be observed in handling service pistol . . . . . E-2

**R. ORGANIZATION**

**1.00 Practical Factors**

None.

**2.00 Examination Factors**

- .41 General organization and mission of major commands of the Coast Guard. . . . . E-4
- .42 Standard ship organization and the general responsibilities of each department . . . . . E-4
- .51 Names, abbreviation, and broad responsibilities of the various offices of Coast Guard Headquarters . . . . . E-5
- .71 General organization and operation of chief petty officer messes . . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to

S. SHIP AND AIRCRAFT CHARACTERISTICS AND NAVAL ORDNANCE

1.00 Practical Factors

- .31 Identify major ships and aircraft of the U. S. Coast Guard . . . . . E-3
- .41 Locate and identify each component of the ship's armament and be able to explain in general terms its operation and use (Men Only) . . . E-4

2.00 Examination Factors

- .31 Major types of, general characteristics, and designating symbols for U. S. Coast Guard and naval vessels . . . . . E-3
- .32 Major classes of U. S. aircraft . . . . . E-3
- .33 Nomenclature of superstructure, decks, and parts of hull . . . . . E-3
- .34 Numbering system for decks and lettering and numbering system for compartments . . . . . E-3
- .41 Types of armament installed aboard U. S. Coast Guard vessels (Men Only) . . . . . E-4
- .42 General purposes of the following types of naval ordnance: (Men Only)
  - a. Bombs . . . . . E-4
  - b. Rockets . . . . . E-4
  - c. Projectiles . . . . . E-4
  - d. Guided missiles . . . . . E-4
  - e. Depth charges . . . . . E-4
  - f. Torpedoes . . . . . E-4
  - g. Mines . . . . . E-4
  - h. Pyrotechnics . . . . . E-4
  - i. Propellant charges . . . . . E-4

T. SURFACE PRESERVATION (Men Only)

1.00 Practical Factors

- .31 Prepare aluminum, steel, and wood surfaces for painting . . . . . E-3
- .32 Paint aluminum, steel, and wood surfaces, using standard techniques. . . E-3
- .33 Clean and stow paint brushes . . . . . E-3

2.00 Examination Factors

- .41 General knowledge of Paint and Color Manual (03-263) . . . . . E-4

U. SIGNALS

1.00 Practical Factors

- .31 Recognize general-use signal flags and pennants . . . . . E-3

2.00 Examination Factors

- .41 Sound signals for vessels during reduced visibility underway and at anchor (Men Only) . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to

V. WATCHSTANDING

1.00 Practical Factors

- .21 Relieve a watch, armed with rifle (Men Only) . . . . . E-2
- .22 Stand a sentry watch, observing general orders (Men Only) . . . . . E-2
- .23 Stand a security watch . . . . . E-2
- .31 Relieve a watch, armed with pistol (Men Only) (Groups X and XI  
personnel demonstrate aptitude in the military custom aspects  
only) . . . . . E-3

2.00 Examination Factors

- .21 Eleven general orders for a sentry . . . . . E-2
- .31 Duties of a lookout (Men Only) . . . . . E-3

W. COMMUNICATIONS

1.00 Practical Factors

- .31 Pronounce numbers and phonetic alphabet . . . . . E-3
- .32 Break-out, man, test, and secure a sound-powered phone  
headset (Men Only) . . . . . E-3

2.00 Examination Factors

- .31 Operating procedures for radiotelephone . . . . . E-3
- .81 Forms and procedures for drafting service messages . . . . . E-8

X. CLERICAL

1.00 Practical Factors

- .41 Prepare watch lists . . . . . E-4
- .61 Prepare a standard Coast Guard letter . . . . . E-6

2.00 Examination Factors

- .31 Correct method of submitting a request through official channels . . . . . E-3
- .61 Correct form for a standard Coast Guard letter . . . . . E-6

Y. TRAINING

1.00 Practical Factors

- .51 Prepare an indoctrination schedule for new personnel reporting  
for duty . . . . . E-5
- .52 Select and organize subject matter and instruct by demonstration  
method . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to

Y. TRAINING - Continued

1.00 Practical Factors - Continued

- .61 Teach a group, observing the following steps in developing the lesson:
  - a. Setting the objectives . . . . . E-6
  - b. Presenting the subject matter . . . . . E-6
  - c. Providing trainee application through practical work and drill . . . E-6
  - d. Summarizing key points . . . . . E-6
  - e. Testing trainee achievement . . . . . E-6
- .62 Prepare and administer a written test which includes essay, multiple-choice, true-false, and completion type questions . . . . . E-6
- .63 Use the following training aids and devices:
  - a. Training films, slides, and transparencies . . . . . E-6
  - b. Charts and posters . . . . . E-6
  - c. Models and mockups . . . . . E-6
  - d. Demonstrators and trainers . . . . . E-6
- .64 Conduct instruction by each of the following methods, using subject matter appropriate to each method:
  - a. Lecture . . . . . E-6
  - b. Questions and guided discussion . . . . . E-6
  - c. Drill and practical work . . . . . E-6
  - d. Written study materials . . . . . E-6
- .71 Plan and supervise on-the-job training programs in own rating based on the following:
  - a. Level of trainees' knowledge and skill . . . . . E-7
  - b. Degree of skill to be developed . . . . . E-7
  - c. Available equipment and training aids . . . . . E-7
  - d. Enlisted Ratings Qualifications Manual (CG-311) . . . . . E-7
- .79 Plan and administer in area of responsibility programs of on-the-job training to satisfy the needs of personnel in the lower paygrades:
  - a. To advance in rating . . . . . E-7
  - b. To bring them to the level of efficiency desired in division . . . . E-8
- .91 Plan, organize, direct, and coordinate the various programs implemented by the chief petty officers and petty officers first class for the instruction and supervision of subordinates . . . . . E-9

2.00 Examination Factors

- .61 Purpose and relationship of the following in teaching a lesson:
  - a. Preparation . . . . . E-6
  - b. Presentation . . . . . E-6
  - c. Application . . . . . E-6
  - d. Test . . . . . E-6
  - e. Summary . . . . . E-6
- .62 Responsibilities of petty officers in on-the-job training programs regarding individual, team, and departmental training . . . . . E-6
- .63 Importance and effect of the following in planning and conducting instruction:
  - a. Objectives of the lesson . . . . . E-6
  - b. Characteristics of the subject or skill to be learned . . . . . E-6
  - c. Degrees of the skill required of trainees . . . . . E-6



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to

Y. TRAINING - Continued

2.00 Examination Factors - Continued

- d. Conditions, including time available, under which training must be conducted . . . . . E-6
- e. Available equipment and training aids . . . . . E-6
- f. Instructor-trainee relationships . . . . . E-6

Z. ADMINISTRATION AND SUPERVISION

1.00 Practical Factors

- .61 Prepare a detailed work assignment for men in own division . . . . . E-6
- .71 Prepare a preventive maintenance schedule for an item of machinery or equipment in own division, considering possible changes to ship employment schedule . . . . . E-7
- .72 Prepare naval shipyard and tender work requests (Men Only) . . . . . E-7
- .73 Organize and maintain technical library of publications and other required data . . . . . E-7
- .74 Prepare priority lists of work requests . . . . . E-7
- .75 Prepare inspection and progress reports, job orders, and material requisitions . . . . . E-7
- .76 Supervise the use, filing, and maintenance of publications, logs, and records . . . . . E-7
- .77 Act as assistant to the division officer . . . . . E-7
- .81 Supervise preparation of reports required by own division . . . . . E-8
- .82 Plan, organize and coordinate the work programs of the division to which assigned . . . . . E-8
- .91 Demonstrate administrative ability by obtaining desired results through the effective implementation of broadly or generally stated training plans, directives, and orders . . . . . E-9
- .92 Prescribe work improvement and simplification procedures through organizational analysis . . . . . E-9

2.00 Examination Factors

- .41 Meaning and application of the following leadership principles:
  - a. Knowing the job to be done . . . . . E-4
  - b. Exhibiting and instilling pride in high standards of work . . . . . E-4
  - c. Seeking additional responsibility . . . . . E-4
  - d. Knowing own men and recognizing individual differences . . . . . E-4
  - e. Possessing own sense of responsibility . . . . . E-4
  - f. Delegating authority but not responsibility . . . . . E-4
  - g. Keeping men informed . . . . . E-4
  - h. Being foresighted . . . . . E-4
  - i. Commanding and leading . . . . . E-4
  - j. Promoting morale . . . . . E-4
- .61 How and when to praise, censure, and warn . . . . . E-6
- .62 Standards to follow and errors to avoid in evaluating personnel for performance of duty marks . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to

Z. ADMINISTRATION AND SUPERVISION - Continued

2.00 Examination Factors - Continued

- .71 Supervision for the procurement, care, preservation, stowage, inventory, and disposal of stores, equipment, and repair parts within own area of responsibility ..... E-7
- .81 Principles and techniques of personnel administration ..... E-8
- .82 Procedures for preparation and submission of budget requests and for management of quarterly allotments within own area of responsibility ..... E-8
- .83 Administrative, material, and operational readiness inspections, regulations, and policies, including organizing readiness inspections ..... E-8
- .91 Methods and procedures for improving recruiting and reenlistment conditions within own area of responsibility ..... E-9

AA. COAST GUARD HISTORY

1.00 Practical Factors

None.

2.00 Examination Factors

- .31 Basic Coast Guard history and the evolution of today's Coast Guard ..... E-3
- .32 Roles and missions of the Coast Guard ..... E-3

\*BB. BOATING SAFETY (Refer to Boarding Manual, CG-253) (Men only)

1.00 Practical Factors

- .41 Demonstrate ability to conduct a federal equipment check ..... E-4
- .42 Prepare Report of Boarding and Notice of Violation (CG-4100) ... E-4
- .51 Conduct examination to determine compliance with federal ventilation and navigation light requirements (inland and international) ..... E-5
- .61 Demonstrate knowledge of reckless or negligent operation and prepare violation report ..... E-6

2.00 Examination Factors

- .41 Source and limits of boarding officer's jurisdiction and authority ..... E-4
- .42 Content of Federal Boating Laws (specifically equipment requirements) ..... E-4
- .43 Define classes of boats and equipment requirements for each ... E-4
- .51 Organization and functions of Coast Guard Auxiliary ..... E-5
- .61 Required ships documents and papers ..... E-6
- .71 Duties and responsibilities of regatta patrol commander ..... E-7

# QUALIFICATION CODES

## QUALIFICATION CODES

- ★ 1. Qualification codes supplement the enlisted rating structure in order to determine as accurately as possible the special training requirements, improve personnel distribution, eliminate waste of money and manpower which results from overtraining, and makes possible optimum utilization of skilled manpower. A qualification code is based primarily on completion of a technical school (Class B, Class C, or contractor) which provides specific training and resultant qualification to the individual beyond that acquired in basic rate training. However, in certain cases a qualification code is assigned to designate a phase of Class A training that has been completed. Some qualifications may be obtained through the completion of on-the-job training and certification by the commanding officer.
- ★ 2. Coast Guard training activities will assign codes to school graduates upon completion of a course of training for those graduates who were assigned to the training activity on permanent change of station or temporary duty orders, undergoing instruction. Code assignments for graduates attending the Coast Guard training activity on temporary additional duty orders, undergoing instruction, will be made at the time the graduate returns to his permanently assigned unit for resumption of regular duty. Code assignments to personnel completing training at another Armed Force's or manufacturer's facility will be made by the Coast Guard command to which the graduate reports for duty. Individual commands have responsibility for assignment of codes earned through on-the-job training, and for cancellation of qualification codes in the case of those considered improperly coded. Qualification codes may be canceled by a commanding officer based on an individual's demonstrated lack of knowledge or ability.
3. An individual may be assigned a maximum of six qualification codes. If one is qualified for the assignment of more than six codes, those which his commanding officer believes to be most valuable to the Service will be assigned. In case of doubt, the six most recently acquired codes will be used. The individual will be consulted concerning the codes which he desires and for which he is qualified, but Service needs must prevail in the case of any conflict.
4. Qualification codes assigned an individual will be recorded in the "Other Qualification" column of Item 1 of page 3 of the service record.
5. Instructions for the preparation of required diary entries for recording qualification codes will be found in the Personnel Accounting Manual.

BOATSWAIN'S MATE (BM)

CODE      SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01      Light Attendant

*Special Service*

Eligibility. Completion of the Minor Aids to Navigation Course at the Coast Guard Training Center and serve satisfactorily for at least six months at a Light Attendant Station or the Coast Guard Training Center.

Requirements. Maintain and operate, or instruct in all phases of aids to navigation duties insofar as they are applicable to minor aids.

02      Light Station

*Special Service*

Eligibility. Completion of the Major Aids to Navigation Course at Coast Guard Training Center and serve satisfactorily for at least six months at a Light Station, Radiobeacon or Fog Signal Station, or the Coast Guard Training Center.

Requirements. Maintain and operate, or instruct in all phases of aids to navigation duties insofar as they are applicable to major aids.

03      Duty Aboard Buoy Tender

*Special Service*

Eligibility. Completion of the Minor Aids to Navigation Course at the Coast Guard Training Center and have served six months as a boatswain's mate aboard a buoy tender, or have served twenty-four months aboard tenders in rated capacity and certified qualified.

Requirements. Handle, stow, rig, and maintain buoys from a tender, including associated accessories and equipment.

04      Buoy Deck Supervisor

*Special Service*

Eligibility. Completion of the Minor Aids to Navigation Course at Coast Guard Training Center and have served at least six months as buoy deck supervisor aboard buoy tender, or have served twenty-four months aboard tenders and which at least six months must have been in the capacity of buoy deck supervisor. Must be certified qualified for buoy deck supervision.

Requirements. Handle, stow, rig and maintain buoys from a tender. Conduct safe and effective buoy deck operations.

05      Construction Rigger

*Special Service*

Eligibility. Must be qualified through six months on-the-job training or previously served as a construction rigger and found qualified by his commanding officer.

Requirements. Construction of aids to navigation. Operate boats, cranes, derricks, and barges. Splice and rig wire rope.

3.2-18

QUARTERMASTER (QM)

CODE    SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01    Signalman

Eligibility. Completion of appropriate resident Coast Guard or Navy school. Previous training if considered qualified. On-the-job training if certified qualified.

Requirements. Demonstrate qualifications of SIGNALMAN SECOND CLASS in Section 5-3 of CG-311, Enlisted Ratings Qualifications Manual.

GUNNER'S MATE (GM)

CODE    SPECIALTY, ELIGIBILITY AND REQUIREMENTS

F6    Ordnance Equipment

Eligibility. Completion of Class C Ordnance Equipment School at Coast Guard Training Center.

Requirements. Overhaul, repair, and adjust electric, hydraulic, and mechanical components of Coast Guard installed ordnance and ASW equipment, including power drives and fire control systems.

★ 01    Armorer

Eligibility. Completion of a resident service school for depot (or fifth echelon) level maintenance of small arms; or completion of two years' on-the-job training at the Small Arms Repair Shop, Supply Center, or Marksmanship Training Unit, Cape May Training Center, if certified to be qualified.

Requirements. Repair of small arms requiring major overhaul or complete rebuild of parts, subassemblies, assemblies, or the end item.

★ 02    Master Armorer

Eligibility. Qualified as Armorer and completion of the National Match Pistol and Rifle Maintenance Course (641-F1); or qualified as Armorer and completion of four weeks' on-the-job training at other-service gunshop: (Marksmanship Training Unit, Infantry Center Ft. Benning; Weapons Training Battalion, Marine Corps Base Quantico; Small Arms Training Unit, Naval Training Center San Diego; Marksmanship School, Military Training Center Lackland Air Force Base), if certified to be qualified.

Requirements. Maintenance, repair, and match-conditioning, of match-grade small arms requiring major overhaul or complete rebuild of parts, subassemblies, assemblies, or the end item.

★

Mount Maintenance

Eligibility. Completion of Class C Service School for the specific equipment or on-the-job training if certified qualified.

Requirements. Operate and maintain specified ordnance and ASW equipment. Perform operational, preventative, and technical maintenance of the equipment.

★

Specialized Training

- 03 3"/50 Cal. Gun Mount
- 04 5"/38 Cal. Gun Mount
- 05 5"/54 Cal. Gun Mount
- 06 MK 32 Torpedo Tube Mount

★ 07

Demolition Man

Eligibility. Completion of appropriate resident course sponsored by one of the Armed Forces.

Requirements. Use service demolition explosives to safely and effectively conduct demolition projects.

★ RADARMAN (RD)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

Specialized CIC Training

Eligibility. Completion of Class C Service School or certification by the commanding officer after on-the-job experience to a demonstrated level of proficiency.

Requirements. (01) Ability to operate the indicated system and perform signal analysis. Understand the concept of electronic warfare. (02) Ability to radar control fixed and/or rotary wing ASW aircraft, utilizing standard search and attack doctrine, during coordinated ASW operations.

- 01 AN/WLR-1 & AN/WLR-3 ECM
- 02 ASW Air Control

★ SONARMAN (SO)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

- 01 General Sonarman

Eligibility. Graduate of Coast Guard Class A School or Navy Class A School (A1 portion only).

Requirements. Operate sonar and associated test equipment. Perform limited operational and preventative maintenance.

★ 02 Sonar Technician

Eligibility. Graduate of Navy Class A School (A1 & A2 portions, during or after FY 1968) or Sonar Technician Class B School.

Sonarmen having an electronics background equivalent to that taught in the A2 portion of SO School may be considered for the O2 qualification code. Submit requests, fully substantiated, to Commandant (FE) for final determination.

Requirements. Operate, maintain and repair specified sonar equipment. Perform operational, preventative, and technical maintenance on ASW systems. Operate and maintain test equipment.

03 Attack Teacher Instructor

Eligibility. One year on-the-job training and certification by commanding officer.

Requirements. Instruct shipboard ASW teams in the operation of ASW equipment, utilizing the trainer (sonar & target simulator), and teaching standard ASW tactics/doctrine based on appropriate Naval warfare publications.

Specialized Training

O4 AN/SQS-1/11 Sonar  
O5 AN/SQS-36A Sonar  
O6 AN/SQS-38 Sonar  
O7 FANFARE/NIXIE Torpedo Countermeasures  
O8 MK NC-2 ASW Plotting Systems  
F2 MK 1 Attack Plotter  
F3 MK 105 Underwater Battery Fire Control System  
F4 MK 264 Torpedo Control Panel

FIRE CONTROL TECHNICIAN (FT)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

F6 Ordnance Equipment



Eligibility. Completion of Class C Ordnance Equipment School at Coast Guard Training Center.

Requirements. Overhaul, repair, and adjust electric, hydraulic, and mechanical components of Coast Guard installed ordnance and ASW equipment, including power drives and fire control systems.

01 Advanced Fire Control Technician

Eligibility. Graduate of Fire Control Technician Class B Service School.

Requirements. Advanced fire control technician background gained through suitable course of instruction.

Control System Technician

Eligibility. Completion of Class C Service School or contractor school for the specific equipment or on-the-job training if certified qualified.

Requirements. Maintain and repair specified fire control equipment. Perform operational, preventative, and technical maintenance of the equipment. Operate and maintain test equipment.

Specialized Training

- 02 MK 52 GFCS
- 03 MK 56 GFCS
- 04 MK 57 GFCS
- 05 MK 63 GFCS
- 06 MK 7 Stable Element
- 07 MK 22, 3"/50 RF Power Drive
- F2 MK 1 Attack Plotter Fire Control System
- F3 MK 105 Underwater Battery Fire Control System
- F4 MK 264 Torpedo Control Panel

ELECTRONICS TECHNICIAN (ET); TELEPHONE TECHNICIAN (TT); and  
ELECTRONICS TECHNICIAN COMMUNICATION (ETN)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01 Engineering Electronics Technician

Eligibility. Graduate of RCA School or equivalent course.

Requirements. Electronic engineering background gained through suitable course of instruction.

02 Advanced Electronics Technician

Eligibility. Graduate of Electronics Technician Class B School.

Requirements. Advanced electronics background gained through suitable course of instruction.

03 Advanced Telephone Technician

Eligibility. Graduate of Telephone Technician Class B School.

Requirements. Advanced telephone technician background gained through suitable course of instruction.

Electronic Equipment Specialist

Eligibility. Graduate of Class C School or contractor school for the specific equipment or certification by the commanding officer after on-the-job training to a demonstrated level of proficiency.

Requirements. Ability to perform detailed corrective and preventative maintenance on the indicated equipment.

- 04 AN/SPS-29 Radar and MK-10 IFF
- 05 AN/WLR 1/3 ECM (Maintenance)
- 06 TSEC/KW-26 Crypto
- 07 KW-7 Crypto
- 08 KW-37 Crypto
- 09 ASR/KSR-28 Teletype
- 10 ASR/KSR-32 Teletype
- 11 Loran-A Ground Station
- 12 AN/FPN-38/39 Loran-C
- 13 AN/FPN-41/42 Loran-C
- 14 AN/FPN-44/45/46 Loran-C
- 15 AN/SPN-29 Loran-C
- 16 AN/SPN-30 Loran-C
- 17 AN/SPN-(36) Loran-C
- 18 AN/SPN-(39) Loran-C
- 19 AN/FPN-30 Cross Correlation Loran-A Timer
- 20 Microwave Line Technician
- 21 Carrier Equipment Technician

- 24 MK 56 GFCS
- 25 AN/SPQ-10 Radar
- 26 AN/URT-23-AN/WRC-1 Transmitter Receiver
- 27 AN/URC-58 Transreceiver
- 28 AN/WRT-2 Transmitter
- 29 AN/SPS-29
- 32 MK-10 IFF
- 33 AN/SPA 66
- 34 AN/SPA 34
- ★ 37 Radio Transmitter Equipment, Collins URG-11

Electronic System Operator

Eligibility. Graduate of Class C School for the specified system for certification by the commanding officer after on-the-job training to a demonstrated level of proficiency.

Requirements. Ability to operate and perform preventative maintenance on the indicated system.

30 Loran-C Ground Station

35 Communications Indoctrination Course

Eligibility. Graduate of Basic Electronics School and six weeks pre-ETN Communications Indoctrination Course at CG Training Center, Governors Island.

Requirements. Basic Electronics School and Communications Indoctrination training background. Qualifies for subsequent assignment to Navy Class C training in Crypto equipments and/or Systems.

36 Defense Against Sound (DASE)

Eligibility. Must have successfully completed a government security school for Defense Against Sound (DASE).

Requirements. Certified by commanding officer on ability to perform as a member of a technical security team.

RADIOMAN (RM)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01 Advanced Radioman

Eligibility. Completion of Radioman Class B Service School.

Requirements. Advanced electronics background gained through a suitable course of instruction.

02 Teletype Repairman

Eligibility. Graduate of Class C Service School or contractor school in teletypewriter repair.

Requirements. Maintain, adjust, and repair mechanical and electrical assemblies of teletype machines; clean, lubricate, and perform operational adjustments on teletype machines. Dismantle defective equipment to ascertain cause of defect, and make repairs or replace parts. Test repaired and adjusted equipment.

03 Communication Security Equipment Operator

Eligibility. Must have appropriate security clearance with cryptographic access; on-the-job training in the crypto systems of own unit and certified qualified.

Requirements. Initiate starting sequences and perform operating adjustments to online cryptographic equipment. Maintain logs to record equipment operation and other data concerning cryptological operations. Operate off-line cryptographic equipment.

04 Radio Operator, High Speed

Eligibility. Hold a valid speed key certificate.

Requirements. Transmit and receive radio messages in International Morse Code at speeds in excess of 30 words per minute.

★ 05 Amateur Radio Operator

Eligibility. Holds a valid amateur operator's license issued by the FCC.

Requirements. Detailed requirements are set and licenses issued by FCC. Minimum requirements include the passing of a code test at a rate of 13 words per minute, both sending and receiving, and of a written examination in basic theory and regulations administered by the FCC. An individual must possess a General Class (including Conditional Class) license or higher.

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

★ 01 Court Reporter, Stenographic

Eligibility. Ability to record proceedings by shorthand or machine shorthand methods at minimum speed of 120 wpm. On-the-job training if certified qualified.

Requirements. Performs stenographic duties at courts-martial, courts of inquiry, boards of investigation, or military commissions. Prepares correspondence and records of court-martial proceedings in accordance with instructions contained in Manual for Courts-Martial, United States, and Uniform Code of Military Justice. Prepares correspondence and records of proceedings of Coast Guard boards of inquiry and/or investigation in accordance with Coast Guard Supplement to Manual for Courts-Martial. When assigned to Merchant Marine Investigation Sections performs verbatim reporting duties.

★ 02 Court Reporter, Closed Microphone

Eligibility. Completion of Naval Justice Closed Microphone Court Reporting School, or on-the-job training if certified qualified.

Requirements. Records proceedings on voice reproduction equipment by means of a Stenomask at minimum speed of 175 wpm. Performs closed microphone recording and transcription duties at courts-martial, courts of inquiry, Merchant Vessel Investigation Sections, investigations and conferences. Prepares attendance records, allied papers and correspondence in accordance with applicable instructions.

03 Legal Clerk

Eligibility. Graduate of Naval Justice School or on-the-job training if certified qualified.

Requirements. Prepares correspondence, records, and allied papers of courts-martial, courts of inquiry, investigations, and conferences in accordance with instructions contained in Uniform Code of Military Justice: Manual for Courts-Martial, United States, Coast Guard Supplement to MCM and other administrative manuals and publications.

04 Classification Interviewer

Eligibility. Completion of U. S. Navy Classification and Interviewing School.

Requirements. Interviews enlisted personnel to obtain information for classification purposes. Determines educational and occupational background, hobbies, abilities, and interests of personnel interviewed. Administers and scores basic battery and classification tests. Aids in screening personnel for special billets or training assignments.

05 Intelligence and Law Enforcement

Eligibility. On-the-job training at a Coast Guard Intelligence Office if certified qualified. Previous training for at least 6 months if considered qualified.

Requirements. Perform administrative and associated tasks involving typing and filing. Prepare and route correspondence pertaining to Intelligence, Port Security and Law Enforcement, Requests for Investigations, and other related forms and reports. Maintain office files and intelligence library. Possess a thorough understanding of the procedure involving security clearances for military personnel and civilian employees; screening of applicants for Port Security Cards and Merchant Mariner Documents, and processing of AEC "Q" Clearance applications. Be clearable based on a satisfactory background investigation for access to secret material. Maintain current and have a working knowledge of the following publications and directives: CG Intelligence Manual, CG-282; OPNAVINST 5510.1 (Navy Security Manual as amended for Coast Guard use); Uniform Code of Military Justice, 1951, as amended, and the CG Supplement thereto (CG-241); CG Boarding Manual, CG-253; Port Security Manuals, CG-299-1 and CG-299; USN Physical Security Manual (OPNAVINST P5510.45); Industrial Security Manuals (DOD); and various ONI and DIA publications required in the office to which assigned.

06 Aviation Yeoman

Eligibility. Completion of appropriate resident Navy school. On-the-job training if certified qualified.

Requirements. Maintain aviation records including aircraft logbooks, historical records, and accessories records. Maintain a technical library of aviation technical directives including letter type directives, bulletins and changes.

3-2-21

STOREKEEPER (SK)

CODE      SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01      Aviation Storekeeper

Eligibility. Completion of appropriate resident Navy school. Previous training if considered qualified. On-the-job training if certified qualified.

Requirements. Receive, identify, store, and issue aviation supplies, spare parts, and stocks of technical aviation items. Confirm shipments and make reports of excesses, shortages, or damages. Classify and stow materials, using the required protective measures. Pack, tag, and inspect equipment and parts. Make inventories, prepare, and maintain records pertaining to stock control and issuance of aviation equipment and materials.

02      Transportation Specialist

Eligibility. On-the-job training and certified to be qualified.

Requirements. Prepare Bills of Lading for freight and household goods shipment. Know instructions and regulations governing movement of freight, HHE and personnel. Select most economical and suitable means for shipment of

freight, HHE and transportation of personnel. Furnish information to personnel regarding transportation, make reservations, issue transportation requests and make arrangements for both individual and drafts for travel by rail, bus, air, mixed or other means of transportation. Review for correctness claims of personnel covering movement of household goods, automobiles and dependents.

03 Voucher Specialist

Eligibility. On-the-job training and certified to be qualified.

Requirements. Thoroughly qualified in preparation and examining of all classes of vouchers.

04 Inventory Management Specialist

Eligibility. On-the-job training and certified to be qualified.

Requirements. Determine quantities to order for stock at authorized issuing unit based on Economic Order Quantities, demand, seasonal fluctuations, funds available, etc. Reconcile class ledgers to stock ledgers to physical inventory. Be familiar with all reports regarding stores inventory, daily receipts and expenditures and methods to adjust records based on shortages/overages in receipts or inventory.

05 Military Pay

Eligibility. On-the-job training and certified to be qualified.

Requirements. Thoroughly qualified in the maintenance of Military Pay Records, preparation of pay rolls and the disbursements of all pay and allowance entitlements.

06 Procurement Specialist

Eligibility. On-the-job training and certified to be qualified.

Requirements. Prepare procurement documents including Requests for Quotations for all types of material from open market, contract, and Federal sources. Be familiar with all regulations regarding procurement; ascertain most economical and suitable means for procurement considering time available and transportation costs.

COMMISSARYMAN (CS)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01 Baker

Eligibility. Completion of appropriate service or commercial resident school. Qualify by on-the-job training if certified to be qualified.

02 Butcher

Eligibility. Completion of appropriate service or commercial resident school. Qualify by on-the-job training if certified to be qualified.

JOURNALIST (JO)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01 Publications Editor

Eligibility. Completion of appropriate resident training course. Previous training or experience if considered to be qualified. On-the-job training if certified to be qualified.

02 Advanced Information Specialist Training

Eligibility. Completion of appropriate resident training school. Previous training or experience if considered to be qualified. On-the-job training if certified to be qualified.

03 Specialist, Broadcast Training

Eligibility. Completion of appropriate resident training school. Previous training or experience if considered to be qualified. On-the-job training if certified to be qualified.

LITHOGRAPHER (LI)

VACANT

MUSICIAN (MU)

VACANT

PHOTOGRAPHER'S MATE (PH)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01 Motion Picture Cameraman

Eligibility. Graduate of appropriate service school. Qualify by on-the-job training if certified to be qualified.



Requirements. Operates all professional-type motion picture cameras used in the Coast Guard, including single or double system sound cameras. Employs standard motion picture shooting techniques to obtain film coverage for use in training, documentary and public information films.

02 Advanced Photographer Training

Eligibility. Graduate of appropriate service school. Qualify by on-the-job training if certified to be qualified.

MACHINIST'S MATE (MM)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01 Engineman

Eligibility. Graduate of Coast Guard Engineman School or be certified as qualified by demonstrating the ability to operate, maintain, service, adjust and repair internal combustion engines.

Requirements. Maintain, service, trouble-shoot, and repair internal combustion engines aboard vessels not allowed the engineman rating; provide assistance to shipboard engineman in times of emergency or heavy workload, and service boats and vehicles at shore stations.

ENGINEMAN (EN)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01 Hydraulic Equipment Repairman

Eligibility. Qualify by demonstrating the ability to maintain, trouble-shoot, and make major repairs to hydraulically operated equipment and controls and to have satisfactorily completed the basic hydraulics correspondence course (NAVPERS 16193).

Requirements. Maintain, service, remove, replace, inspect, adjust and repair hydraulically operated equipment, controls and related accessories installed aboard vessels.

02 Gas Turbine Engineer

Eligibility. Graduate of U. S. Naval Gas Turbine (Class C) Engineman School or qualify by demonstrating the ability to operate, trouble-shoot and make repairs to vessel-installed gas turbines for a six month period.

Requirements. Maintain, service, trouble-shoot, inspect, adjust and repair gas turbine equipment, controls and related accessories installed aboard vessels.

★ 03

Station Small Boat Engineer

Eligibility. Qualify by demonstrating the ability to operate and maintain all boats and boat engines at the station to which assigned. Must be certified as qualified by the district engineer, except where authority has been delegated to a group commander, after serving as a small boat operator and engineer a minimum of nine months. The district commander may delegate the certification authority for this qualification code to group commanders for personnel assigned to group units.

Requirements. Ability to operate the small boats assigned and administratively assist in the routine operation of the station as well as satisfactorily performing the small boats and engine maintenance functions.

04

Engineman, Light Attendant

Eligibility. Completion of the minor aids to navigation course at Coast Guard Training Center and served satisfactorily at least six months at a light attendant station or Coast Guard Training Station. In exceptional cases requirements for graduation from Minor A to N School may be waived by district commander if man's training and experience is equivalent to completion of the course.

Requirements. Maintain and operate, or instruct in all phases of aids to navigation duties insofar as applicable to minor aids. Perform as engineman in boat crew of any small craft assigned. Performs routine maintenance on internal combustion engines and mechanical systems on small craft assigned and at unmanned major aids to navigation.

05

Engineman, Light Station

Eligibility. Completion of the major aids to navigation course at Coast Guard Training Center and served satisfactorily at least six months at a light station, a lightship, or the Coast Guard Training Center; or six months duty involving maintaining an unmanned major aid to navigation. In exceptional cases requirements for graduation from Major A to N School may be waived by district commander if man's training and experience is equivalent to completion of the course.

Requirements. Maintain and operate, or instruct in, all phases of aids to navigational duties insofar as they are applicable to major aids, including internal combustion engines, compressors for signals, lighting apparatus, heating systems and all other mechanical systems found at light stations.

BOILERMAN (BT)

VACANT

3.2.7

ELECTRICIAN'S MATE (EM)

CODE      SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01      Electrician's Mate, Construction Electrician

Eligibility. Completion of appropriate resident training. Previous training or experience if considered qualified. On-the-job training if certified qualified.

Requirements. Operates, services and repairs shore electrical systems. Installs shore electrical systems in accordance with the National Electrical Code including generators, switchgear, distribution panels, motors, circuitry, etc., up to and including 440 volts AC, 3 phase.

02      Motor Rewinder

Eligibility. Qualify by demonstrating ability to properly rewind, DC, AC single and polyphase, motors and generators up to 10 KW of the types commonly installed aboard ship or graduate of U. S. Naval Electrician's Mate Class B School.

Requirements. Performs routine rewinds of DC and AC single and polyphase motors and generators up to 10 KW of the types commonly installed aboard vessels.

03      Interior Communication Technician

Eligibility. Qualify by demonstrating ability to maintain and repair automatic ship service, sound powered and MC communications equipment including circuits, switchboards, batteries, and power equipment, and has satisfactorily completed the I. C. electrician's correspondence course for the appropriate rate; or graduate of U. S. Naval Interior Communications Electrician's Mates' School, Class A or B as appropriate.

Requirements. Maintain, service, trouble-shoot, inspect, adjust and repair interior communications equipment aboard high endurance cutters or equivalent vessels.

Gyro System Technician

Eligibility. Graduate of appropriate resident Coast Guard, Navy or specialized commercial training school or certification by commanding officer after on-the-job training to a demonstrated level of proficiency necessary to satisfy specialty requirements.

Requirements. Knowledge of and familiarity with the specific installed system sufficient to maintain, service, trouble-shoot, adjust and make repairs aboard ship.

- 04      Mark 19
- 05      Mark 23
- 06      Mark 24
- 07      Mark 18
- 08      Mark 14

9) Electrician's Mate, Distribution Systems (High Voltage)

Eligibility. Same as Electrician's Mate, Construction Electrician.

Requirements. Meet all requirements of Electrician's Mate, Construction Electrician, with no limit on voltage.

10 Electrician's Mate, Minor Aids to Navigation

Eligibility. Completion of minor aids to navigation course at Coast Guard Training Center, and serve satisfactorily for at least six months at a light attendant station or the Coast Guard Training Center. In exceptional cases the requirement for completion of minor aids to navigation course may be waived if district commander considers the man's training and experience to be equivalent to completion of the course.

Requirements. Install, maintain and operate, or instruct in, all phases of electrical systems found on minor aids to navigation.

11 Electrician's Mate, Major Aids to Navigation

Eligibility. Completion of major aids to navigation course at Coast Guard Training Center, and serve satisfactorily for at least six months at a light station, a lightship, or the Coast Guard Training Center on duty involving maintaining an unmanned major aids to navigation (light, fog signal or radio-beacon). In exceptional cases the district commander may waive the completion of the major aids to navigation course if he considers the man's training and experience to be equivalent to completion of the course.

Requirements. Install, maintain and operate, or instruct in, phases of electrical systems found on major aids to navigation. These requirements are in addition to those for an Electrician's Mate, Minor Aids to Navigation.

3.2.7

DAMAGE CONTROLMAN (DC)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01 Heavy Construction

Eligibility. Completion of appropriate resident service school. Previous experience in heavy construction or on-the-job training if qualified by certification.

Requirements. Constructs and repairs all types of construction such as shore aids to navigation, pile driving, piers, wharves, and heavy load bearing structures. Knowledge of proper use and application of various types of construction materials and equipment.

02 Concrete Construction

Eligibility. Previous experience or on-the-job training if qualified by certification.

Requirements. Fabricates and erects forms for concrete structures; positions and anchors reinforcing steel; supervises mixing, placing, curing and finishing concrete for buildings, foundations, retaining walls, and other structures.

03 Construction Inspector

Eligibility. Completion of appropriate service school or training. Previous experience or on-the-job training if certified qualified by certification.

Requirements. General knowledge of all aspects of construction; insures compliance with plans and specifications; prepares inspection and progress reports and material requisitions; makes equipment, material and manpower estimates from drawings, sketches and specifications; capable of directing general job operations involving light construction.

04 Plastic Boat Repairman

Eligibility. Graduate of Coast Guard Training Center Damage Control School having received the special course in the repair of plastic boats or be certified as qualified by demonstrating the ability to accomplish repairs to plastic boats at an industrial facility for a sufficient length of time.

Requirements. Performs on a routine basis repairs to all types of fiber-glass boats involving damage classified less than major.

05 Certified Pipe Welder

Eligibility. Damage controlmen holding the Certified Welder Qualification Code upon completion of appropriate resident service school (U. S. Naval Certified Welder School, Class C, or other facility giving certification in all phases of pipe welding in accordance with Military Qualifications Tests for Welders, MIL-STD-248 Tests #4 and #6, or Marine Engineering Regulations and Material Specification CG-115).

Requirements. Performs emergent welding operations where commercial facilities are not readily available and the degree of expertise is more critical than that of the general welding qualifications of the damage controlman rating. Requalification required annually to retain qualification designation unless actively engaged in the type welding specified; i.e., less than a three-month period of idleness.

AVIATION MACHINIST'S MATE (AD)

CODE      SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01      Reciprocating Engines

Eligibility. Completion of appropriate resident Coast Guard, Navy or Air Force school. Previous training if considered qualified. On-the-job training if certified qualified.

Requirements. Maintain, service, remove, replace, inspect, test, adjust, preserve and depreserve aircraft reciprocating power plants and accessories including fuel systems (except fuel cells) and excluding propellers and associated accessories; operate aircraft reciprocating power plants for test purposes.

02      Turboshaft Engines

Eligibility. Completion of appropriate resident Coast Guard, Navy, Air Force or manufacturer's resident service school. Previous training if considered qualified.

Requirements. Maintain, service, remove, replace, inspect, test, adjust, preserve, and depreserve aircraft turboshaft power plants and accessories including fuel systems except fuel cells and excluding propellers and associated accessories; operate aircraft turboshaft power plants for test purposes.

03      Propellers, Hydraulic

Eligibility. Completion of appropriate resident Coast Guard, Navy, Air Force or manufacturer's resident service school. Previous training if considered qualified. On-the-job training if certified qualified.

Requirements. Maintain, service, remove, replace, inspect, test, adjust, preserve, and depreserve hydraulic aircraft propellers and associated accessories.

★

Coding Combinations

- 04      Reciprocating Engines and Turboshaft Engines
- 05      Reciprocating Engines and Propellers, Hydraulic
- 06      Turboshaft Engines and Propellers, Hydraulic
- 10      Reciprocating Engines, Turboshaft Engines and Propellers, Hydraulic

AVIATION ELECTRICIAN'S MATE (AE)

CODE      SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01      Electrical

Eligibility. Completion of appropriate resident Coast Guard or Navy school. Previous training if considered qualified. On-the-job training if certified qualified.

Requirements. Maintain, adjust, test, remove, replace and make authorized repairs to all aircraft electrical power, lighting, control and non-instrument indicating and warning systems and their components; perform periodic inspections of components for which responsible.

02 Instruments

Eligibility. Completion of appropriate resident Coast Guard or Navy school. Previous training if considered qualified. On-the-job training if certified qualified.

Requirements. Maintain, adjust, test, remove, replace and make authorized repairs to aircraft electrical, mechanical and vacuum instrument systems and instrument type warning systems and components; perform periodic inspections of components for which responsible.

03 Propellers

Eligibility. Completion of appropriate resident Coast Guard, Navy, Air Force or manufacturer's service school. Previous training if considered qualified. On-the-job training if certified qualified.

Requirements. Maintain, service, remove, replace, inspect, test, adjust, preserve and depreserve electrical components of aircraft propellers with associated accessories and circuitry.

- 04 ★ Coding Combinations
- 05 Electrical and Instruments
- 06 Electrical and Propellers
- 10 Instruments and Propellers
- 10 Electrical, Instruments and Propellers

AVIATION STRUCTURAL MECHANIC (AM)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01 Structures, Fixed Wing

Eligibility. Completion of appropriate Coast Guard or Navy school. Previous training if considered qualified. On-the-job training if certified qualified.

Requirements. Maintain aircraft fuselage, wings, control surfaces, empennages, seats, wheels and tires. Install and rig flight control surfaces; fabricate and assemble metal parts and make minor repairs to aircraft skin, install rivets and metal fasteners; build up wheels and tires, paint, perform periodic inspections of components for which responsible.

02 Hydraulic

Eligibility. Completion of appropriate resident Coast Guard or Navy school. Previous training if considered qualified. On-the-job training if certified qualified.

Requirements. Maintain hydraulic systems, including main and auxiliary systems and actuating subsystems, landing gear (excluding wheels and tires), brakes, pneumatic and pressurization/air-conditioning systems, pumps valves, regulators, lines and fittings, accumulators, heat exchangers, cooling turbines, oleo struts; remove, repair and replace hydraulic, pneumatic, air-conditioning and pressurization system components. Perform periodic inspections of components for which responsible.

03 Safety Equipment

Eligibility. Completion of appropriate resident Coast Guard or Navy school. Previous training if considered qualified. On-the-job training if certified qualified.

Requirements. Maintain safety belts, shoulder harnesses, inertia reels, fire extinguishing systems (excluding fire detection systems), portable fire extinguisher, ventilation and other utility systems and associated lines, fittings, valves and controls; replenish anti-icing and utility systems. Perform periodic inspection of components for which responsible.

04 Machinist

Eligibility. Completion of appropriate resident Coast Guard, Navy, Air Force or commercial aviation school. Previous training if considered qualified. On-the-job training if certified qualified.

Requirements. Operate and maintain basic machine shop including shaping, drilling, milling, turning, cutting, grinding, pressing, sawing, forming, bending, flaring, beading, punching, shrinking, stretching, dimpling, riveting, spinning, shearing, swaging, rolling, filing, cleaning, plating, examination and testing, heat treating, welding, cutting operations; fabricate and assemble metal parts and make repairs to assemblies and subassemblies.

05 Rotary Wing

Eligibility. Completion of appropriate resident Coast Guard, or Navy school. Previous training if considered qualified. On-the-job training if certified qualified.

Requirements. Maintain aircraft fuselage, control surfaces, rotor blades, empennages, seats, wheels and tires. Install and rig flight control surfaces; fabricate and assemble metal parts and make minor repairs to aircraft skin; install rivets and metal fasteners; build up wheels and tires, paint, perform periodic inspections of components for which responsible.

06 Coding Combinations

- 06 ★ Structures - Fixed wing, and Hydraulic
- 07 Structures - Fixed wing, Hydraulic and Safety Equipment
- 08 Structures - Fixed wing, Hydraulic, Safety Equipment and Machinist
- 09 Structures - Fixed wing, Hydraulic, Safety Equipment and Rotary Wing
- 10 Structures - Fixed wing, Hydraulic, Safety Equipment, Machinist and Rotary wing



AVIATION ELECTRONICS TECHNICIAN (AT)

CODE      SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01      Engineering Aviation Electronics Technician

Eligibility. Graduate of RCA school or equivalent course.

Requirement. Electronic engineering background gained through suitable course of instruction.

02      Advanced Aviation Electronics Technician

Eligibility. Graduate of Aviation Electronics Technician Class B school.

Requirements. Advanced electronics background gained through suitable course of instruction.

03      ★ Coding Combinations  
Engineering Aviation Electronics Technician and Advanced Aviation Electronics Technician

AVIATION SURVIVALMAN (ASM)

CODE      SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01      Parachutes

Eligibility. Graduate of appropriate resident Navy Class A School.

Requirements. Maintain, inspect, rig, handle, stow and issue all types of parachutes. Operate and repair sewing machines. Maintain and repair safety belts, shoulder harnesses and inertia reels.

02      Aviation Ordnance

Eligibility. Completion of appropriate resident school. On-the-job training if certified qualified.

Requirements. Maintain, repair, install, operate, service, and handle small arms; aviation ordnance and armament equipment; and JATO. Stow, maintain, service, handle, install, and remove aviation munitions and pyrotechnics. Supervise the operation of a small arms range.

03      Aviation SAR/Survival Equipment

Eligibility. Completion of appropriate resident school. On-the-job training if certified qualified.

Requirements. Maintain, service, and repair aviation survival equipment and flight clothing. Service and maintain aircrew oxygen-breathing equipment, droppable pumps, and SAR equipment carried by aircraft.

04	★	<u>Coding Combinations</u>
05		<u>Parachutes and Aviation Ordnance</u>
06		<u>Parachutes and Aviation SAR/Survival Equipment</u>
10		<u>Aviation Ordnance and Aviation SAR/Survival Equipment</u>
		<u>Parachutes, Aviation Ordnance and Aviation SAR/Survival Equipment</u>

#### AVIATION RATINGS--SPECIAL SERIES

All aviation special series qualification codes shall lapse or be cancelled as follows:

Lapse shall occur when the individual concerned has no maintenance experience on the system(s) concerned within the previous 36 months. No action is required by individual or unit except where an individual has more than six CGQC's. In such a case, lapsed codes should be dropped before current ones.

Cancellation shall occur when the individual concerned has no maintenance experience on the system(s) concerned within the previous 60 months. Commanding officers shall effect cancellation in accordance with previously described procedures.

#### ★ Aircrew Qualifications

Eligibility and requirements for aircrew designations are contained in the Air Operations Manual (CG 333). Lapse of designation as defined in 311.7 of CG 333 is not applicable to the assignment of qualification codes.

<u>Designation</u>	<u>Aircraft Type</u>									
	C-130	C-123	U-16	H3	H52	C4/11	C-130/H52	C130/U16	U16/H52	H3/H52
SAR AIRCREWMAN	U2	-	U3	U4	U5	-	U6	U7	U8	U9
SUPPORT AIRCREWMAN	YA	YB	YC	-	YD	YE	YF	YG	YH	-
PLANE CAPTAIN	T1	T4	T5	T3	T2	T7	T8	T6	T9	TA
FLIGHT ENGINEER	S1	-	-	-	-	-	-	-	-	-
FLIGHT MECHANIC	-	TB	TC	TD	-	TE	-	-	-	-
AVIONICSMAN	TF	TG	TH	TI	-	TJ	-	TL	-	-
DROPMASER	TM	-	TN	-	-	-	-	TO	-	-
LOADMASTER	Z8	Z9	-	-	-	-	-	-	-	-

Special Combination and additional aircrew coding

- S3 - Flight Engineer C-130/Plane Captain H52
- S4 - Flight Engineer C-130/Plane Captain H3
- S5 - Flight Engineer C-130/Plane Captain C-123
- S6 - Flight Engineer C-130/Plane Captain U16
- S7 - Plane Captain C-130/U16/H52
- U1 - Shipboard helicopter aircrewman (to be assigned by IBSSEC only)

SPECIALIZED TRAINING--AIRFRAME AND ENGINE SYSTEMS

Eligibility. Graduate of appropriate resident service school. Has current or recent (within past 36 months) maintenance experience on the system(s) indicated.

Requirements. Performs specialized technical inspection, test, maintenance, repair and replacement on the specified system(s). Personnel are identified by code depending upon qualification or combination of qualifications held.

<u>CODE</u>	<u>Specialty</u>
V1	<u>C-130 Pseudraulics</u>
V2	<u>C-130 Electrical</u>
V3	<u>C-130 Propeller</u>
V4	<u>C-130 Engine</u>
V5	<u>C-130 Instrument</u>
V6	<u>C-130 Flight Controls and Autopilot</u>
V7	<u>H-52 Airframe</u>
V8	<u>H-52 Engine</u>
V9	<u>H-3 Airframe</u>
W1	<u>H-3 Engine</u>
W2	<u>C-130 Electrical and C-130 Instrument</u>
W3	<u>C-130 Electrical and C-130 Propeller</u>
W4	<u>C-130 Electrical and C-130 Flight Controls and Autopilot</u>
W5	<u>C-130 Instrument and C-130 Propeller</u>
W6	<u>C-130 Instrument and C-130 Flight Controls and Autopilot</u>
W7	<u>C-130 Propeller and C-130 Flight Controls and Autopilot</u>
W8	<u>C-130 Electrical, C-130 Instrument and C-130 Propeller</u>
W9	<u>C-130 Electrical, C-130 Instrument and C-130 Flight Controls and Autopilot</u>
X1	<u>C-130 Electrical, C-130 Propeller and C-130 Flight Controls and Autopilot</u>
X2	<u>C-130 Instrument, C-130 Propeller and C-130 Flight Controls and Autopilot</u>
X3	<u>C-130 Electrical, C-130 Instrument, C-130 Propeller and C-130 Flight Controls and Autopilot</u>
X4	<u>H-52 Airframe and H-3 Airframe</u>
X5	<u>H-52 Airframe and H-52 Engine</u>
X6	<u>H-3 Airframe and H-3 Engine</u>
X7	<u>H-52 Airframe, H-52 Engine, H-3 Airframe</u>
X8	<u>H-52 Airframe, H-52 Engine, H-3 Engine</u>
X9	<u>H-52 Airframe, H-3 Airframe, H-3 Engine</u>
Y1	<u>H-52 Engine, H-3 Airframe, H-3 Engine</u>
Y2	<u>H-52 Engine and H-3 Engine</u>

Y3	<u>H-52 Engine, H-52 Airframe, H-3 Engine and H-3 Airframe</u>
Y4	<u>C-130 Pseudraulics, H-52 Airframe, H-3 Airframe</u>
Y5	<u>C-130 Pseudraulics, and H-52 Airframe</u>
Y6	<u>C-130 Pseudraulics and H-3 Airframe</u>
Y7	<u>C-130 Engine and H-52 Engine</u>
Y8	<u>C-130 Engine and H-3 Engine</u>
Y9	<u>H-52 AFCS (ASE) System</u>
Z1	<u>H-52 Electrical System</u>
Z2	<u>H-52 AFCS (ASE) System and H-52 Electrical System</u>
Z3	<u>C-130 High Pressure Lox System</u>
Z4	<u>U-16 Aircraft General</u>
Z5	<u>U-16 Propeller</u>
Z6	<u>U-16 Aircraft General and U-16 Propeller</u>
Z7	<u>C-123 Aircraft General</u>
XA	<u>H-3 AFCS (ASE) System</u>
XB	<u>H-3 Electrical System</u>
XC	<u>H-3 AFCS (ASE) System and H-3 Electrical System</u>
XD	<u>H-52 and H-3 AFCS (ASE) Systems</u>
XE	<u>H-52 and H-3 Electrical Systems</u>
XF	<u>H-52 and H-3 AFCS (ASE) Systems and Electrical Systems</u>

SPECIALIZED TRAINING--AVIONICS

Eligibility. Graduate of Class C service school for associated aircraft systems or certification by commanding officer after on-the-job training to a demonstrated level of proficiency necessary to satisfy specialty requirements.

Requirements. Knowledge and familiarity with installed aircraft avionic systems sufficient to isolate and replace defective units, perform repair and maintenance to module level and accomplish routine GO-NO-GO and minimum performance tests. Personnel are identified by code depending on qualifications or combinations of qualifications held.

(Note: For the purpose of qualification code assignment only, the following definitions apply to the categories specified below:

Communications Systems include all LF, MF, HF, VHF, UHF, receivers, transmitters or transceivers and ICS equipment.

Navigation Systems include all OMNI, ADF, Glide Slope, Marker Beacon, Navigation Computer and Loran equipment.

Microwave Systems include all Radar, Tacan, IFF, Radar Altimeter and Doppler equipment.)

CODE	<u>Specialty</u>
J1	<u>H-52 Communications</u>
J2	<u>H-52 Navigation</u>
J3	<u>H-52 Microwave</u>
J4	<u>H-52 Communications and Navigation</u>
J5	<u>H-52 Communications and Microwave</u>
J6	<u>H-52 Navigation and Microwave</u>

J7 H-52 Communications, Navigation and Microwave  
 J8 C-130 Communications  
 K C-130 Navigation  
 K1 C-130 Microwave  
 K2 C-130 Communications and Navigation  
 K3 C-130 Communications and Microwave  
 K4 C-130 Navigation and Microwave  
 K5 C-130 Communications, Navigation and Microwave  
 K6 C-130 Ice Patrol Peculiar  
 K7 U-16 Communications  
 K8 U-16 Navigation  
 K9 U-16 Microwave  
 L1 U-16 Communications and Navigation  
 L2 U-16 Communications and Microwave  
 L3 U-16 Navigation and Microwave  
 L4 U-16 Communications, Navigation and Microwave  
 L5 C-123 Communications  
 L6 C-123 Navigation  
 L7 C-123 Microwave  
 L8 C-123 Communications and Navigation  
 L9 C-123 Communications and Microwave  
 M1 C-123 Navigation and Microwave  
 M2 C-123 Communications, Navigation and Microwave  
 M3 H-3 Communications  
 M4 H-3 Navigation  
 M5 H-3 Microwave  
 M6 H-3 Communications and Navigation  
 M7 H-3 Communications and Microwave  
 M8 H-3 Navigation and Microwave  
 M9 H-3 Communications, Navigation and Microwave

AEROGRAPHER'S MATE (AG)

VACANT

MARINE SCIENCE TECHNICIAN (MST)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01 Oceanographic Specialist

Eligibility. Completion of Coast Guard Oceanography School Class C (or equivalent). Certification of equivalency must be obtained from Commandant (OMS-1).

Requirements. Collect, record and analyze standard oceanographic data. Collect, preserve and analyze standard oceanographic samples. Be proficient in the use of oceanographic codes, logs, forms, charts and graphs. Conduct preventative maintenance and minor repairs on oceanographic equipment.

02 Meteorological Observer

Eligibility. Completion of U. S. Navy Aerographer's Mate School Class A, Coast Guard Marine Science Technician Class A School or a Coast Guard specialized training program in meteorological observation.

Requirements. Conduct weather observations (surface and winds aloft) and record, encode and transmit the data obtained. Decode and plot appropriate data on meteorological diagrams, forms and charts. Care for and service non-electronic meteorological instruments. Sketch preliminary analyses of synoptic charts.

03 Aerial Ice Observer

Eligibility. Completion of U. S. Navy Aerial Ice Observer Course or certification as qualified by Commander, International Ice Patrol.

Requirements. Locate and identify floating ice masses from aircraft. Plot ice positions and characteristics on standard International Ice Patrol charts. Draft and encode ice information messages. Draft and encode synoptic ice data messages.

04 Meteorological Forecaster

Eligibility. Completion of U. S. Navy Aerographer's Mate School Class B.

Requirements. Analyze surface and upper air charts. Construct prognostic surface and upper air charts. Prepare extended period weather forecasts. Provide weather forecasts for extended flights. Prepare vertical cross sectional diagrams and horizontal weather depiction charts. Prepare forecasts for wind generated waves and swells. Instruct and supervise personnel in the use and maintenance of meteorological equipment. Instruct and supervise personnel in the collection, analysis and use of meteorological data.

05 Rawin-Radiosonde Operator

Eligibility. Completion of the U. S. Navy Rawin-Radiosonde Set Operator Course, Class C.

Requirements. Install and perform preventative maintenance on upper air equipment. Check and prepare radiosonde flight equipment. Evaluate the meteorological data obtained by upper air equipment.

06 Marine Science Chemistry

Eligibility. Certification as qualified by the Commanding Officer, CG Oceanographic Unit on the basis of a Coast Guard training program, or demonstrable capability backed by specialized academic or professional experience.

Requirements. Make quantitative chemical analysis of sea water to determine the content of dissolved gases, nutrients, microconstituents, plankton pigments, tracers, and hydrogen ions at sea or ashore. Prepare and quality control the standards and reagents used in the procedures. Setup and operate PH meter, spectrophotometer, analytic balance, and other laboratory equipment. Perform specialized calculations in the reduction of marine chemistry data. Have a knowledge of laboratory safety procedures and requirements.

HOSPITAL CORPSMAN (HM)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01 Aviation Medicine Technician

Eligibility. Completion of appropriate resident training.

Requirements. Assists flight surgeon or medical officer in special examinations and treatments of Coast Guard aviators and flight personnel. Operates special aviation medical apparatus such as pressure chamber machines; assists in conducting aviation medical tests; maintains aviation medical records and files. Engages in aerial flight as part of crew when required or directed. May be qualified as air crewman.

★ 02 Advanced Hospital Corpsman Technician

Eligibility. Completion of Navy Advanced Hospital Corpsman School (Class B) prior to 1970 and/or completion of Advanced Hospital Corpsman Training School, U. S. Public Health Service Hospital, New Orleans.

Requirements. Renders medical assistance to personnel aboard ships or shore stations in the absence of a medical officer. Performs advanced first aid and minor surgery; renders routine and emergency medical care; inspects facilities to insure sanitary conditions; maintains necessary records and accounts; procures medical supplies and materials.

★ 03 Clinical Laboratory Technician

Eligibility. Completion of appropriate resident Navy School or completion of accredited Clinical Laboratory Technique School.

Requirements. Sets up and adjusts laboratory apparatus and equipment; performs blood counts, urinalyses, bacteria tests, and malaria smears; identifies and classifies animal parasites and insects affecting man.

★ 04 Medical Services Technician (Formerly Medical Administrative Technician)

Eligibility. Completion of appropriate resident Navy School. Assignment of this qualification code for personnel who have not completed the Naval Medical Administration School or Naval Medical Services Technician School will be made upon application to Commandant (KMA).

Requirements. Performs clerical and administrative duties at medical activities. Prepares personnel records and reports; transcribes, records, and files medical case histories; requisitions supplies, services, and equipment, and maintains accounting records for all property and supplies; insures adequate storage and preservation of supplies; inspects food and plans menus; insures proper maintenance of buildings and grounds and compliance with safety precautions and activity defense measures.

05 Pharmacy Technician

Eligibility. Completion of appropriate resident Navy School or accredited School of Pharmacy.



Requirements. Prepares and dispenses prescribed medicines and pharmaceutical preparations. Compounds preparations according to prescriptions issued by medical officers and/or dental officers; procures, stores, and issues pharmaceutical materials and supplies; maintains files and records and submits required pharmacy reports.

06 Preventive Medicine Technician

Eligibility. Completion of appropriate resident Navy School or holds a current registration as an Environmental Sanitarian.

Requirements. Assists medical officer in epidemiological and sanitation work. Conducts field collection, sampling, and analysis of data on epidemic and endemic diseases; applies statistical methods of human mortality, morbidity, and demographical studies; makes laboratory identification of animal parasites of man, and supplies methods of control; conducts water, milk, food and galley sanitation procedures, and sewage and garbage disposal inspections.

07 X-Ray Technician

Eligibility. Completion of appropriate Navy School or accredited civilian course of instruction.

Requirements. Operates medical X-ray equipment in production of roentgenograms, application of X-ray therapy, and fluoroscopic examinations and carries out photodosimetric duties. Processes X-ray film and properly stows them; administers prescribed treatment to therapy clinic patients. Performs operational maintenance on electrical generators, circuits, rectifiers, X-ray generators, and tubes; assists in preparation of records and maintenance of files.

08 Medical Deep Sea Diving Technician

Eligibility. Completion of appropriate resident Navy Diving School.

Requirements. Basic skills and knowledge required to assist medical officers in prevention and treatment of illnesses associated with deep sea diving and high pressure conditions. Operates pressure chamber and submarine rescue apparatus; enters pressure chamber to care for patients suffering from decompression sickness; performs diving and other duties related to underwater rescue.

09 Operating Room Technician

Eligibility. Completion of appropriate resident Navy School.

Requirements. Basic skills and knowledge required to prepare and maintain operating room for surgery. Selects, sterilizes, and lays out instruments and other supplies for surgical operations; passes instruments and otherwise assists in surgical operations; assists anesthetist in administering anesthetics, in giving artificial respiration, and in the use of resuscitators; makes minor repairs to, and otherwise maintains, surgical equipment; prepares patients for surgical operations and gives nursing care to patients during and after surgery.

10 Dental Technician

Eligibility. Graduate of Navy Class A Dental Technician School.

Requirement. Have graduated from the Navy Class A Dental Technician School and have a background in the duties of a Dental Technician.

★ 14 Advanced Clinical Laboratory Technician

Eligibility. Completion of appropriate resident Navy School, or equivalent civilian training.

Requirements. Assists in advanced laboratory procedures and in the operation of all phases of a blood bank. Analyzes and types blood, prepares blood for preservation and transfusion; performs all the duties of a clinical laboratory assistant.

★ 15 Physical and Occupational Therapy Technician

Eligibility. Completion of appropriate resident Navy school, or equivalent civilian training.

Requirements. Assists Medical Officers and/or Physical Therapists in the treatment of patients. Assists in the fabrication and fitting of static and dynamic splints and assistive devices. Administers such therapeutic procedures as massage, hot and cold packs, whirlpool bath, paraffin bath, infrared, ultraviolet, diathermy and electrical stimulation; therapeutic exercise programs including range of motion, joint measurement, gait training, postural exercises, and other exercise routines for strength, endurance and mobility.

SAR AIRCREW DESIGNATIONS

Eligibility and requirements for aircrew designations are contained in the Air Operations Manual (CG-333).

<u>CODE</u>	<u>Specialty (Aircraft type(s))</u>
11	H3
12	H52
13	H3 and H52

DENTAL TECHNICIAN (DT)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01 Prosthetic

Eligibility. Completion of appropriate Navy Class C School.

Requirements. Laboratory procedures required in fabrication of dental prosthetic appliances, including cast construction; record base and occlusion rim construction; complete denture construction; denture repairs; cast partial denture construction; wrought metal technique; fixed partial

dentures; applied odontography; impression tray construction; and dental technology.

02 Repair

Eligibility. Completion of appropriate Navy Class C School.

Requirements. Procedures of installation, maintenance, and repair of equipment used in dental operating rooms and prosthetic laboratories.

03 Preventive Oral Hygienist

Eligibility. Completion of Class A Dental Technician School, Dental Technician, Second Class, or above, and complete satisfactorily a minimum of six months practical training in dental hygiene. This training shall include chairside and text book/classroom instruction. Both the teaching and observation of the practical work at the chairside will be under the supervision of a dental officer.

Requirements. Satisfactorily demonstrate ability to perform the duties required of a dental hygienist, including oral examinations, X-rays, oral medications and instruct in oral hygiene.

STEWARD (SD)

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

01 Flag Officer's Mess

Eligibility. Presently serving or has previously served as steward at a Flag Officer's Mess and certified to be qualified.

Requirements. Prepares vegetables, salads, desserts, and baked goods for the Flag Officer's Mess; operates and cleans all types of mechanical galley equipment; cleans and maintains sanitary condition of galley, pantry, and storage spaces; inspects and directs storage of provisions; prepares menus; estimates quantities and kinds of foodstuffs needed for cruises; assists in ordering provisions; keeps accurate records and reports of financial transactions when required.

02 Flag Officer's Mess Supervisor

Eligibility. Presently serving or has previously served as the supervisor of a Flag Officer's Mess and certified by a Flag Officer as so qualified.

Requirements. Demonstrate by on-the-job performance the ability to control and supervise the complete operation of a Flag Officer's Mess, including management of the procurement and preparation of subsistence items, in accordance with current directives, and supervision of assigned personnel in the proper performance of duties.

SPECIAL SERIES

CODE SPECIALTY, ELIGIBILITY AND REQUIREMENTS

AC Air Controlman

Eligibility. Completion of appropriate Navy, Air Force, or FAA resident school. Previous training if considered qualified.

Requirements. Performs duties involved in the control of aircraft traffic at airdromes, seadromes, and on board ship by means of radio, radar, flashing light signals, and flag hoists. Stays familiar with the purpose, use, and principles of air traffic control radars and surveillance and precision approach equipment. Understands operating procedures of control towers, operations officers, and approach control.

A1 RCC Assistant Controller

Eligibility. Completion of resident SAR course at Coast Guard Training Center or the SAR correspondence course and on-the-job training if certified qualified. Previous training if considered qualified.

Requirements. Assist the area or district RCC controller in the direction and coordination of search and rescue activities.

A2 Oceanographic Technician

Eligibility. Completion of appropriate Coast Guard resident training. On-the-job training at the Coast Guard oceanographic unit or an oceanographic cutter if certified qualified.

Requirements. Assist in oceanographic surveys by conducting and supervising data collection activities involving use of mechanical and electronic devices, such as nansen bottles, multiple sensor underwater fish, bathy-thermographs, corers, plankton nets, and precision depth recorders; make associated field computations; conduct chemical analyses; conduct quality control procedures and analyses.

A3 Equipment Mechanic

Eligibility. Previous experience if found qualified. On-the-job training if certified to be qualified.

Requirements. Service, perform preventive maintenance on, repair and overhaul materials handling equipment, automotive vehicles, gasoline and diesel engines, air compressors, internal combustion prime movers of arc-welders, electric generators, and water distillation and purification equipment; locate, analyze and correct faulty conditions in this equipment. EN, MM, BT, EM.

A4 Engineering Aide

Eligibility. All engineering ratings where training or experience was obtained by serving in the capacity of an assistant to an engineer (civil, naval, etc.) at either the district or Headquarters level.

Requirements. Performs such duties at district offices or Headquarters as may be assigned such as, but not limited to, field inspections, preparation of reports, in charge of M&R detachments.

Specialized Training

- A5 Civil Engineering
- A6 Naval Engineering
- A7 Electronics Engineering

A8 Engineering Watch Officer

Eligibility. All engineering ratings who qualify by demonstrating the ability to operate and maintain main propulsion and auxiliary equipment and initiate proper casualty and damage control procedures on the type vessel and propulsion unit to which assigned. Certified as qualified six months after commanding officer's authorization to assume engineering watch officer's duties.

Requirements. Have a complete understanding of the operation and casualty and damage control procedures on the type vessel and propulsion unit to which assigned.

Specialized Training

- A9 Geared Diesel
- B1 Diesel Electric
- B2 Diesel & Gas Turbine
- B3 Turbo-electric
- B4 Geared Turbine

\* B5 Certified Welder

Eligibility. All shipboard engineering ratings. Graduate of U. S. Naval Shipfitter Class A School or intermediate Welding Class C School as appropriate or demonstrate the ability to select the proper filler metal and

heat range and to weld common metals in all positions using both gas and electric welding processes and arc-air gouging; possess a good knowledge of safety procedures in the use and care of welding equipment. Certified qualified if satisfactorily completed the following tests in MIL-STD-248: shielded metal-arc Category III and V, all positions, plate and pipe tests #1 and #6; plus gas welding, test #2.

Requirements. Perform routine welding operations aboard vessels not authorized a qualified damage controlman or assist shipboard welders in times of emergency or heavy workload. Requalification required annually to retain qualification designation unless actively engaged in welding, i.e., less than a three month period of idleness.

★ BA Certified Aluminum Welder

Eligibility. All shipboard engineering ratings. Satisfactory completion of Philadelphia Naval Shipyard welding course in aluminum and HY-80 steel or equivalent resident school.

Requirements. Perform routine welding of aluminum using both Gas Metal Arc and Gas Tungsten Arc welding processes in all positions for both fillet and butt welds. Know proper machine settings and safety precautions. Requalification required annually to retain qualification designator unless actively engaged in welding, i.e., less than a three month period of idleness. Requalification through satisfactory completion of welding tests in MIL-STD-248 (Test #1, all positions, gas metal-arc, gas tungsten-arc, Category, VIII.)

★ BB Certified Advanced Welder

Eligibility. All shipboard engineering ratings. Demonstrate ability to weld common shipboard metals including HY-80, Mi-Cu, Cu-Ni, CRES, and mild steel by satisfactory completion of the following welding tests in MIL-STD-248: Test #1 and #6, shielded metal-arc, Category I (filler MIL-10018) and Category V; test #2, gas welding.

Requirements. Perform routine welding operations aboard vessels. Requalification required annually to retain qualification designation unless actively engaged in welding; i.e., less than a three month period of idleness.

B6 Air-Conditioning and Refrigeration Repairman

Eligibility. Enginemen and machinist's mates having graduated from the U. S. Navy's Refrigeration and Air-Conditioning School or other comparable service or commercial school.

Requirements. Maintains shipboard and shoreside refrigeration and air-conditioning systems, including adjustments, testing, overhauls, and repairs to system components.

B7 Plumber

Eligibility. Completion of appropriate resident service school. Previous training or experience if considered qualified. On-the-job training if certified to be qualified.

Requirements. Assemble and install piping, equipment, and facilities to provide fuel, air, water, steam, and waste disposal. MM, DC, BT.

B8

Equipment Operator

Eligibility. Graduate of appropriate service school. Qualify by on-the-job training if certified to be qualified on present assignment or previous experience.

Requirements. Operate and service automotive and materials handling equipment; transport personnel and materials; perform operator's service checks on such vehicles as buses, trucks, semi-trailers, fork lifts, and mules; maintain required maintenance records. Operate and service construction and earth moving equipment, read and follow grade stakes in excavating, filling and grading areas to specifications; operate shovels and cranes in loading, lifting, and dredging; adapt cable assemblies and change attachments on equipment; maintain required maintenance records. MM, EN.

B9 Maintenance and Repair Detachment

Eligibility. Has previously been assigned or is now assigned to a maintenance and repair detachment and considered qualified through on-the-job training.

Requirements. Performs the duties of his rating generally without immediate supervision. Works from drawings and specifications. Prepared "as built" drawings of work accomplished.

C1

Surveying Experience

Eligibility. Has been a member of a survey party, either in Coast Guard or as a civilian, and is qualified in use of surveying instruments. On-the-job training can qualify if certified by the district commander. Completion of appropriate resident service school will also qualify.

Requirements. Stakes out construction sites, determines property boundaries and marker locations, runs levels, places grade stakes and performs basic surveying tasks and computations.

Diesel Engine Specialist

Eligibility. Graduate of Class C service school or commercial school for the specialized diesel engine series; or certified as qualified by the commanding officer or district engineer as appropriate after on-the-job training to a demonstrated level of proficiency necessary to satisfy specialty requirements.

Requirements. Ability to perform detailed maintenance, troubleshooting, and major repair and overhaul of diesel engines, controls, and related accessories.

Specialized Training

C2 VT-12-M  
C3 VT-220-M  
C4 FM OP Series

- C5 Caterpillar, 333 Series
- C6 GM 71 Series
- C7 GM 268 & 268A Series
- C8 Cooper Bessemer GN & GSB Series
- C9 Caterpillar, 353, 398 Series
- D1 Cooper Bessemer FVEM Series

Officer-in-Charge, Small Buoy Tender

Eligibility. Completion of the Minor Aids to Navigation Course at the Coast Guard Training Center or on-the-job training if certified qualified, and serve satisfactorily for at least six months as Officer-in-Charge of a WLI (small), WLIC, or WLR (small) or as Executive Officer/Acting OIC of a WLI (large), WLR (large), or WLM.

Requirements. Command effectively and navigate safely a tender; maintain navigation aids. Responsible for requirements of Chapter 7-3 CG-300 Coast Guard Regulations.

Level of Qualification

- DA OIC, Small Buoy Tender, Rivers
- DB OIC, Small Buoy Tender, Coastal Waters
- DC OIC, Small Buoy Tender, Rivers and Coastal Waters
- DE Executive Officer/Acting OIC of a WLI (large), WLR (large), or WLM.
- DF Officer-in-Charge, Lightship

Eligibility. Completion of the Major Aids to Navigation Course at the Coast Guard Training Center or on-the-job training if certified qualified, and serve satisfactorily for at least six months as Officer-in-Charge, or Executive Officer of a lightship.

Requirements. Command effectively and navigate safely a lightship; operate the lightship's navigational aids. Responsible for requirements of Chapter 7-3, CG-300, Coast Guard Regulations.

- DH Officer-in-Charge, Coast Guard Station

Eligibility. Serve satisfactorily for at least six months as Officer-in-Charge of a Coast Guard Station and be certified qualified.

Requirements. Command effectively a Coast Guard Station. Responsible for requirements stated in Chapter 7-3, Coast Guard Regulations.



D2 Officer-in-Charge, Light Attendant Station

Eligibility. Completion of the minor aids to navigation course at the Coast Guard Training Center or on-the-job training if certified qualified, and serve satisfactorily for at least six months as officer-in-charge of a light attendant station.

Requirements. Command effectively a light attendant station; maintain minor aids to navigation. Responsible for requirements of Chapter 7-3, USCG Regulations.

D3 Officer-in-Charge, Light Station

Eligibility. Completion of the major aids to navigation course at the Coast Guard Training Center or on-the-job training if certified qualified, and serve satisfactorily for at least six months as officer-in-charge of a light station, radiobeacon station, fog signal station, or loran station.

Requirements. Command effectively a major Coast Guard aids to navigation station ashore. Operate the station's navigational aids. Responsible for requirements of Chapter 7-3, USCG Regulations.

D4 Officer-in-Charge, Harbor Tugs

Eligibility. Serve satisfactorily for at least six months as officer-in-charge of a WYTL or as executive officer/acting officer-in-charge of a WYTM.

Requirements. Command effectively and navigate safely a harbor tug. Carry out tug's law enforcement, search and rescue, and other assigned missions. Responsible for requirements of Chapter 7-3, USCG Regulations.

D5 Officer-in-Charge, Patrol Craft

Eligibility. Serve satisfactorily for at least six months as officer-in-charge, acting officer-in-charge, or executive officer of a Coast Guard patrol craft (WPB).

Requirements. Command effectively and navigate safely a patrol craft. Carry out WPB's search and rescue and other assigned missions. Responsible for requirements of Chapter 7-3, USCG Regulations.

D6 Surfman

Eligibility. One year's continuous experience in the operation of the 36', 44' or 52' MLB, including use in adverse sea and weather conditions and be certified qualified by group commander.

Requirements. Operate effectively a Coast Guard motor lifeboat and its equipment, including the radio, radar, radio direction finder and Fathometer; be proficient in SAR procedures.

D7 Boat Coxswain

Eligibility. On-the-job training if certified qualified. Previous training if considered qualified.

Requirements. Operate safely a Coast Guard power boat of at least two of the following types: 45' BUSL, 40' UT, 30' UT, 25' MSB, 24' MCB, 19' TICWAN, or 17' UTML. Know duties of boat coxswain, characteristics of the boat, use of its equipment, procedures for lowering and hoisting or launching, boat etiquette and safety precautions.

D8 Motorboat Boarding Officer

Eligibility. Pay grade E-4 or senior. Complete Coast Guard course in boating safety thru correspondence, district school (32 hours of instruction minimum), or Headquarters school and certified qualified by commanding officer. Qualification will be maintained by annual completion of any of the above. Code to lapse two years from date of last course completion (as verified on page three of service record).

Requirements. Conduct patrols of boating areas to deter and detect unsafe and/or unlawful vessel operations; board vessels observed in violation; board uninspected vessels to determine compliance with Federal requirements.

D9 Boom Operator

Eligibility. On-the-job training if certified qualified. Previous training if considered qualified.

Requirements. Operate the cargo boom installed on a Coast Guard Cutter (WLB, WLM, WLI, WLR, WAK or WAGB-230' class ); know standard signals and safety precautions.

★D0 Boating Safety Officer

Eligibility. Pay grade E-4 or senior. Now serving or previously assigned (for over three months) as member of a Boating Safety Detachment (BOSDET). Certification to be made by commanding officers. Those now assigned BOSDET duty must serve a minimum of three months to be eligible.

Requirements. Be knowledgeable of general law enforcement procedures. Demonstrate ability to properly enforce Federal laws pertinent to boating safety. Act as instructor for public education courses and military training programs. Carry out public relations functions, including representing the service to the news media.

DG Dangerous Cargoman

Eligibility. Satisfactory completion of appropriate Coast Guard resident school. Previous training if considered qualified. On-the-job training if certified qualified.

Requirements. Be knowledgeable of and able to enforce laws and regulations relating to the stowage, storage, transportation, handling, loading and discharging of commercial explosives, inflammable or combustible liquids in

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BM

F. DAMAGE CONTROL

1.00 Practical Factors

.60 Act as scene leader or officer-in-charge of repair party ..... E-6

2.00 Examination Factors

.40 Proper care and maintenance of equipment used in fire-fighting ..... E-5  
 .41 Theories of practical damage control ..... E-5  
 .60 Read damage control diagrams and know symbols ..... E-6  
 .90 Theory of damage control with regard to stability ..... E-8  
 .91 Methods of changing list and trim to effect emergency hull repairs ..... E-8

G. AIDS TO NAVIGATION

1.00 Practical Factors

.40 Identify various types of floating and fixed A/N and their appendages ..... E-5  
 .41 Conduct on station maintenance including:  
     a. Painting and renewing of Retro-Reflective materials ..... E-5  
     b. Replace defective lamps, flashers, sun-switches, lamp changer, lenses and lanterns (Except Classical Lenses) ..... E-5  
     c. Replace exhausted emergency and/or primary batteries and connections to lanterns ..... E-5  
 .42 Maintain shore structures housing A to N facilities and fixed aids ..... E-5  
 .43 Inspect and make-up buoy moorings ..... E-5  
 .60 Use various Coast Guard A to N rigging and special tools to withdraw, commission, and stow buoys and appendages ..... E-6

2.00 Examination Factors

.40 Nomenclature of A to N equipment, structures, and tools ..... E-5  
 .41 Basic electricity as applied to series, parallel, and series parallel circuits to batteries ..... E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BM

D. SEARCH AND RESCUE - Continued

2.00 Examination Factors - Continued

- .61 Prices for supplies or services etc., procedures for and collection methods ..... E-6
- .80 Proper authorities to notify, legal implications (rings, wallet money, etc.), Coast Guard's responsibility involving deceased victims ..... E-7
- .90 Responsibilities of on-scene CDR as per CG-308 (SAR MANUAL) ..... E-8
- .91 Search and Rescue Organizational Structure ..... E-8
- .92 Factors which influence search area and considerations involved in selecting and running search patterns ..... E-8

E. GUNNERY

1.00 Practical Factors

- .01 Uses of line throwing gun and rewinding equipment ..... E-4
- .39 Act as Gun or Mount Captain:
  - a. .50 cal. and 7.62 cal. Machine Gun ..... E-4
  - b. .81 MM Mortar ..... E-5
  - c. 3"/50 ..... E-6
  - d. 5"/38 ..... E-7
- .60 Perform routine maintenance to include cleaning, lubrication, minor adjustments of .50 cal. and 7.62 cal. machine guns and .81 MM Mortars and replacement of firing mechanism ..... E-6

2.00 Examination Factors

- .01 Ordnance Terminology ..... E-4
- .03 Various types of projectiles and shot line, occasions for use and operation of the line throwing gun ..... E-4
- .04 Procedures for disassembly, reassembly, acceptable lubricants and cleaning solution for line throwing guns and frequency of use ..... E-4
- .39 Operation and safety precautions of following equipment:
  - a. .50 cal. and 7.62 MM machine guns ..... E-4
  - b. .81 MM Mortar ..... E-5
  - c. 3"/50 single fire mount ..... E-6
  - d. 5"/38 enclosed mount ..... E-7
- .60 Procedures for disassembly and reassembly as necessary for routine cleaning and lubrication of the .50 and 7.62 cal. MG and .81 MM Mortar ..... E-6
- .61 Acceptable lubricants and cleaning solutions and frequency of required maintenance of above mentioned weapons ..... E-6
- .62 Proper methods of using special tools required for routine maintenance and minor adjustments ..... E-6
- .63 Local control spotting and fire control ..... E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BM

D. SEARCH AND RESCUE - Continued

1.00 Practical Factors - Continued

- .60 Prepare assistance reports, deficiency reports and other data ..... E-6
- .61 Sell supplies or services as required ..... E-6
- .90 Act as on-scene commander and/or sub-regional coordinator ..... E-8

2.00 Examination Factors

- .01 Procedures for administering artificial respiration, treatment of cardiac arrest, shock, and other emergency first aid: sources of medical advice ..... E-4
- .02 Emergency distress signals and frequencies ..... E-4
- .03 Identify classes of fires, common causes and locations:
  - a. Extinguishing agent for each class fire ..... E-4
  - b. Application of various extinguishing agents ..... E-4
  - c. Personal hazards to be anticipated and applicable safety precautions ..... E-4
- .04 Methods of connecting and operation of various pumps and eductors in common use in the Coast Guard ..... E-4
- .05 Procedures and uses of various woodworking tools, and flame safety lamp ..... E-4
- .06 Proper equipment for picking up and transporting of a deceased person ..... E-4
- .07 Methods of securing towline aboard disabled vessel ..... E-4
- .08 Methods of towing, prevention of physical damage to towing or towed vessel ..... E-4
- .09 Personnel safety precautions to observe when preparing to take a vessel in tow or while towing and being towed ..... E-4
- .40 Various types and application of shores and patches used in Damage Control, types of material ..... E-5
- .41 Responsibilities and limitation of the Coast Guard in various SAR situations ..... E-5
- .42 Methods of communications and proper frequencies for assisting GOVT and commercial facilities in relation to SAR operations ..... E-5
- .43 Information required to complete SAR reports; reference guide for completing forms ..... E-5
- .44 Message preparation and format and immediate action to take upon notification of a possible SAR incident ..... E-5
- .45 SITREP preparation and format ..... E-5
- .46 PRECOM and EXCOM checks ..... E-5
- .47 Proper heading to maintain in relation to wind and sea when conducting small boat/helicopter operations and methods of handling transfer equipment. Determine primary and secondary sea and swell conditions for ditch and rescue operations ..... E-5
- .48 Methods of approaching disabled vessels or survivors in the water ..... E-5
- .60 Types of supplies and services for which sale is authorized or required ..... E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BM

C. NAVIGATION AND PILOTING - Continued

2.00 Examination Factors - Continued

.14	Operation of Radio Directional Finder and conversion of bearings for use on chart .....	E-4
.15	Procedures for adjusting external Loran controls .....	E-4
.16	Procedures for taking and plotting Loran readings .....	E-4
.17	Causes of deviation of a magnetic compass. Methods of determining compass deviation .....	E-4
.39	Rules of the Road:	
	a. Rules 1-7, 10, 11, 16, 18-25, 27, 29 .....	E-4
	b. Rules 8, 9, 26, 31 .....	E-5
	c. Rules 12-15, 17, 30, 32 .....	E-6
.40	Theory of relative motion .....	E-5
.41	Theory of vector diagrams .....	E-5
.42	Principles of plotting on a maneuvering board (sheets) .....	E-5
.43	Methods of determining CPA, true wind, course and speed made good, current, object vessel course and speed made good .....	E-5
.44	Determine suitable objects for fixing position with horizontal sextant angles .....	E-5
.45	Plot position with 3-arm protractor using sextant angles .....	E-5
.46	Read a stadimeter and a sextant .....	E-5
.47	Use of mooring lines, anchor, natural forces (wind and current) engines, etc. The effect of speed changes to a vessel's handling characteristics .....	E-5
.60	Responsibilities and duties of OOD as stated in Coast Guard Regulations, Chapter 8, Part 9 .....	E-6
.61	Vessel characteristics; advance, transfer, turning circle, distance to stop, draft, etc .....	E-6
.62	How and when to prepare a deviation table .....	E-6

D. SEARCH AND RESCUE

1.00 Practical Factors

.01	Render artificial respiration, cardiac massage and other on-scene first aid .....	E-4
.02	Relay medical advice as furnished by a competent medical authority .....	E-4
.03	Conduct boardings as appropriate in SAR incidents .....	E-4
.04	Extinguish fires .....	E-4
.05	Recover and transfer deceased victims of marine incidents .....	E-4
.06	Take disabled vessel in tow using various methods and approaches .....	E-4
.07	Effect emergency hull repairs and dewatering .....	E-4
.40	Escort and/or recommend courses to safe anchorages .....	E-5
.41	Render routine assistance within the responsibilities and limitations of the Coast Guard (excluding salvage and pilotage) .....	E-5
.42	Conduct COMM and harbor checks .....	E-5
.43	Conduct small boat/helicopter operations. Carry out small boat procedures for aircraft ditch .....	E-5
.44	Run established search areas and patterns in Coast Guard small boat .....	E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BM

C. NAVIGATION AND PILOTING - Continued

1.00 Practical Factors - Continued

- .42 Take radar bearings and ranges and plot same ..... E-5
- .43 Take RDF bearings and plot same ..... E-5
- .44 Take Loran readings and plot same ..... E-5
- .45 Stand underway OOD watches on 95' and smaller vessels ..... E-5
- .60 Use maneuvering board to determine:
  - a. CPA ..... E-6
  - b. True wind ..... E-6
  - c. Current set and drift ..... E-6
  - d. Course and speed made good for own vessel and object vessel ..... E-6
- .61 Determine position with horizontal sextant angles ..... E-6
- .62 Determine ranges with stadimeter ..... E-6
- .63 Determine courses to steer, turn bearings, danger bearings, and safe anchorages ..... E-6
- .64 Stand underway OOD watches on 133' and smaller vessels ..... E-6
- .65 Get WPB vessels underway and maneuver during special sea detail evolutions ..... E-6
- .66 Determine magnetic deviation and prepare deviation table ..... E-6
- .80 Get WLI, WLIC, WLR vessels underway and maneuver while working A to N and during all special sea detail evolution ..... E-7
- .90 Stand underway OOD watches on WLB and WMEC class vessels ..... E-8

2.00 Examination Factors

- .01 Principals of converting magnetic and true bearings ..... E-4
- .02 Identify and distinguish between magnetic and true compass roses ..... E-4
- .03 Chart projections and scales ..... E-4
- .04 Understand latitude and longitudinal system of coordinates ..... E-4
- .05 Interpret chart symbols and abbreviations ..... E-4
- .06 Procedures for energizing and reading fathometers commonly installed on various Coast Guard vessels ..... E-4
- .07 Handling characteristics of single and twin screw boats ..... E-4
- .08 Understand basic forces affecting floating craft:
  - a. Screw thrust, side force, rudder force ..... E-4
  - b. Bank cushion, wind effect, current effect ..... E-4
- .10 Methods of determining course made good with soundings (Fathometer navigation) ..... E-4
- .11 Procedures for transferring and plotting visual and electronic bearings and ranges ..... E-4
- .12 Procedures for determining range and bearings with radar (PPI scope) ..... E-4
- .13 Procedures for adjusting external radar controls for optimum presentation ..... E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BM

B. DECK SEAMANSHIP - Continued

2.00 Examination Factors - Continued

- .56 Procedure for engaging and disengaging wildcat, releasing cable stoppers, proper scope of chain, standard commands and reports required between focsle and bridge, method of determining condition and state of anchor ..... E-5
- .57 Procedures for overhauling detachable links ..... E-5
- .60 Procedures for refueling and being refueled ..... E-6
- .61 Procedures for replenishing and being replenished ..... E-6
- .62 Methods, equipment and material used when repairing and maintaining rubber and plastic boats ..... E-6
- .63 Methods of estimating weights of cargo ..... E-6
- .64 Compatible stowage of various types of cargo ..... E-6
- .65 Special precautions to be observed when handling ammunition ... E-6
- .66 Proper arrangements of boom, controlling guys, tackles, winches, stoppers, and safety equipment ..... E-6
- .67 Boom control operations ..... E-6
- .68 Geometry of boom and load motion ..... E-6
- .69 Physics of boom and load motion, interaction of gravity, friction, etc ..... E-6
- .70 Frequency and methods of inspecting and testing of ground tackles, including wear tolerances ..... E-6
- .71 Contents of unshackling kit ..... E-6
- .72 Procedures for setting up constant tension and limiting devices (pay-out-retrieve) on constant tension machines in use by the Coast Guard ..... E-6
- .75 Frequency and types of lubricants and adjustments authorized on constant tension winches ..... E-6
- .76 Frequency and methods of inspecting and testing weight handling equipment (to include magna-fluxing and dye penetrating tests) ..... E-6
- .80 Methods of assembling and computing strength of various jury rigs ..... E-7
- .81 Procedure for mooring to a buoy, method of making various moors; O'Neil, Flying, Foul Weather, etc., as identified in Knight's Modern Seamanship ..... E-7

C. NAVIGATION AND PILOTING

1.00 Practical Factors

- .01 Convert magnetic bearings to true, take visual bearings with alidade, bearing and azimuth circles ..... E-4
- .02 Operate fathometer ..... E-4
- .03 Qualify as Coxswain on Coast Guard Boats, 30' UTM and smaller ..... E-4
- .40 Qualify as Coxswain on Coast Guard Boats, 44' MLB and smaller ..... E-5
- .41 Use navigation instruments, plot position on chart ..... E-5



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BM

B. DECK SEAMANSHIP - Continued

2.00 Examination Factors - Continued

- .05 Maintenance procedures for painting equipment and paint re-  
moval equipment ..... E-4
- .06 Methods of splicing fiber line and synthetic lines ..... E-4
- .07 Proper stowage and maintenance of natural and synthetic  
lines ..... E-4
- .08 Procedures for lacing and method of determining amount and  
size of line, leather, etc., required for decorative  
servings ..... E-4
- .09 Procedural steps for making decorative servings as enumerated  
under practical factors ..... E-4
- .10 Hand and lip positions required to effect each pipe and use  
of each pipe on the boatswain's call ..... E-4
- .11 Definitions of phraseology used in Knight's Modern Seaman-  
ship for securing a vessel to a pier; proper use of fenders,  
bolo, heavy lines, line throwing guns and messengers. Signs  
of overstrain and safety precaution to be observed when  
docking or mooring a vessel ..... E-4
- .12 Proper color coding for anchor chain ..... E-4
- .40 Methods of splicing wire rope and application of each  
splice ..... E-5
- .41 Proper maintenance and stowage of wire rope ..... E-5
- .42 Methods of reeving all combinations of single, double, and  
treble blocks into tackles ..... E-5
- .43 Methods of computing safe working loads of various types of  
line, wire rope, shackles, hooks, etc ..... E-5
- .44 Preventive maintenance and overhaul of fiber and wire rope  
blocks including wear tolerances ..... E-5
- .45 Types and frequency of lubrication of deck equipment such as  
davits, windlasses, etc ..... E-5
- .46 Boom and winch hand signals ..... E-5
- .47 Methods of securing various types of cargo containers for  
sea ..... E-5
- .48 Nomenclature and relationships of individual components of  
boat boom and accommodation ladder ..... E-5
- .49 Equipment used in replenishment at sea ..... E-5
- .50 Safety precautions to be observed when replenishing at sea ... E-5
- .51 Equipment used when refueling at sea ..... E-5
- .52 Safety precautions to be observed when refueling at sea ..... E-5
- .53 Procedures for measuring canvas to allow for shrinkage,  
seams, etc.; proper applications of various non-metallic ma-  
terials and stitches appropriate for various weights and uses. E-5
- .54 Methods of identifying the weights of canvas and leather ..... E-5
- .55 Procedures of operating both heavy and light duty sewing  
machines to obtain various stitches (includes determination  
of proper size and type thread) ..... E-5

**QUALIFICATIONS FOR ADVANCEMENT**

**Required for  
Advancement to  
BM**

**B. DECK SEAMANSHIP**

<b>1.00</b>	<b>Practical Factors</b>	
.01	Supervise deck and structure maintenance including wooden boats .....	E-4
.02	Maintain deck maintenance equipment such as paint sprayers, brushes, hand tools, etc. ....	E-4
.03	Make up various lines from natural and synthetic rope using common knots and splices for all types of line .....	E-4
.04	Make decorative servings such as turk'sheads, coxcombings, MacNamara lace, sennit, etc. using both leather and fiber materials .....	E-4
.05	Make standard pipes with Boatswain's Call .....	E-4
.06	Supervise mooring line detail .....	E-4
.40	Make wire rope splices as necessary .....	E-5
.41	Reeve various tackles using either wire or fiber rope .....	E-5
.42	Overhaul and repair fiber and wire rope blocks as necessary ..	E-5
.43	Operate, lubricate and maintain deck equipment such as davits, capstans, winches, running and standing rigging .....	E-5
.44	Rig accommodation ladder and boat booms .....	E-5
.45	Lay out equipment and make preparations for refueling and replenishment at sea .....	E-5
.46	Fabricate and repair protective coverings of canvas and other non-metallic materials .....	E-5
.47	Operate and maintain sailmakers equipment (to include both heavy and light duty sewing machines) .....	E-5
.48	Supervise anchor detail during routine anchoring with ships group tackle .....	E-5
.49	Perform routine maintenance on ground tackle .....	E-5
.60	Supervise any individual working party in replenishment or refueling operations .....	E-6
.61	Repair and maintain plastic and rubber boats within unit's capability .....	E-6
.62	Supervise loading, stowage, and discharge of cargo and supplies .....	E-6
.63	Direct and control double and single topping lift booms .....	E-6
.64	Operate, lubricate, and maintain constant tension winches in use in the Coast Guard .....	E-6
.65	Conduct required test of weight handling equipment and fittings (padeyes, cleats, links, etc.) .....	E-6
.66	Supervise anchor detail when mooring to a buoy and when making various moors .....	E-6
.80	Supervise complete replenishment and refueling evolutions ....	E-7
<b>2.00</b>	<b>Examination Factors</b>	
.01	Methods of preparing wood, steel, aluminum, brass, galvanized plastic, and cement surfaces .....	E-4
.02	Types of coatings authorized for surfaces above .....	E-4
.03	Methods of application of above coatings .....	E-4
.04	Preventive maintenance required for various surfaces .....	E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BM

A. ADMINISTRATION - Continued

1.00 Practical Factors - Continued

- .86 Fulfill the duties as Officer-in-Charge of small units ..... E-7
- .87 Maintain following personnel records kept at small units: Health Record, Reenlistment Interviews, Supervisors Report of Accident, Fleet Hometown News Releases, etc..... E-7

2.00 Examination Factors

- .01 Various watches manned and duties of the watches ..... E-4
- .02 Required information, frequency and date of submission and procedures for completing CSMP Cards, hull history, boat records, SSMP Cards, and paint log..... E-4
- .60 Watch responsibilities, emergency stations required to maintain unit and accomplish unit's mission, and organization of unit, capabilities of various ratings assigned ..... E-6
- .61 Required information, frequency and date of submission and procedures for completing Quarterly Reports, Hull and Machinery, Abstract of Operations, etc ..... E-6
- .62 Types of correspondence and chain of command ..... E-6
- .63 Format of standard service letter, rapidraft , business letters, memos ..... E-6
- .64 Sources of supply authorized ..... E-6
- .65 Requirements for obtaining prices ..... E-6
- .66 Inventory levels required of supplies and equipment ..... E-6
- .67 Identifying methods of supplies and equipment ..... E-6
- .68 Types of information contained in district and area OPLANS ..... E-6
- .69 Methods and requirement for identification of accountable material ..... E-6
- .70 Procedures for initiating and occasions requiring a Board of Survey ..... E-6
- .71 Procedures for maintaining accountability through custody cards ..... E-6
- .72 Required information, and procedures for completing purchase documents DD-1149, SF44, DD-1155, DD-1348, CG-4248, etc ..... E-6
- .73 Postal responsibilities as listed in CG-233 ..... E-6
- .80 Required information, frequency and date of submission and procedures for completing commissary, small arms, ammunition and pyrotechnic, financial reports, etc ..... E-7
- .81 Stowage, dissemination and accountability of classified material ..... E-7
- .82 Information authorized for release ..... E-7
- .83 Procedures for releasing items of interest ..... E-7
- .84 Frequency and types of drills and exercises required ..... E-7
- .85 Evaluation of drills and exercises ..... E-7
- .86 Duties and responsibilities of the Officer-in-Charge as outlined in Coast Guard Regulations CG-300 ..... E-7
- .87 Occasions for preparing, verifying, and reviewing personnel records kept at small units ..... E-7

★ BOATSWAIN'S MATE (BM)

**GENERAL RATING**

**SCOPE**

Boatswain's Mates train, direct, and supervise personnel in military duties and in all activities relating to marlinspike, deck, and boat seamanship; and in the painting, maintenance, and upkeep of the ship's structure, rigging, deck equipment, and boats; perform those seamanship duties and tasks which require knowledge and skills beyond the scope of the seaman rate; act frequently as petty officers in charge of patrol boats, tugs, small craft, and small shore units; are in charge of damage control and working parties; maintain discipline when assigned as police petty officers; generally serve as members of gun crews or as gun or mount captains at battle stations; operate and maintain heavy equipment used in loading, unloading, and buoy tending work.

**SERVICE RATINGS**

None.

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
BM

**A. ADMINISTRATION**

**1.00 Practical Factors**

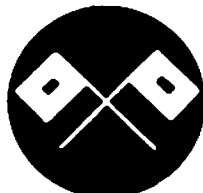
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|---|-----|
| .01 Prepare watch and muster lists .....  | E-4 |
| .02 Maintain paint log, hull history, CSMP cards, boat records, SSMP cards .....  | E-4 |
| .60 Maintain Watch, Quarter and Station bill .....  | E-6 |
| .61 Prepare Quarterly reports for: Boats, Abstract of Operations, Hull and Machinery, financial reports, etc.....             | E-6 |
| .62 Correspond with military and civilian organizations .....   | E-6 |
| .63 Maintain supplies and equipment in accordance with allowance lists .....  | E-6 |
| .64 Stand OOD watch at shore stations and vessels in port .....   | E-6 |
| .65 Take custody of public property and act as property officer, maintain property records .....                              | E-6 |
| .66 Prepare purchase documents: i.e., DD-1149, SF 44, DD-1348, DD-1155, CG-4248, etc .....                                    | E-6 |
| .80 Prepare miscellaneous reports i.e., commissary, small arms, ammunition and pyrotechnics, vehicles and utility bills ..... | E-7 |
| .81 Maintain mail log, classified material inventory, files .....   | E-7 |
| .82 Communicate with news media and local organizations regarding Coast Guard activities .....                                | E-7 |
| .83 Maintain unit organization book .....   | E-7 |
| .84 Effect unit and rating training programs .....  | E-7 |
| .85 Establish and maintain a quarterly program of planned projects and procurements .....                                     | E-7 |



**BM**



**QM**



**SM**



**SO**



**RD**

# **DECK GROUP I**

Boatswain's Mate  
Quartermaster  
Signalman  
Sonarman  
Radarman

BM  
QM  
SM  
SO  
RD

## STEWARDSMAN (TN)

### GENERAL RATE

#### SCOPE

Stewardsmen train for the rating of Steward; assist in preparing and serving meals; maintain cleanliness and orderliness of officer's galley, wardroom and living quarters; and perform general detail duties in officer's mess.

#### QUALIFICATIONS FOR ADVANCEMENT

##### A. BASIC DUTIES

###### 1.00 Practical Factors

- .31 Assist steward in preparing food in galley or in serving food in wardroom mess.
- .32 Set table for informal and formal dinners; arrange seating for officers and guests.
- .33 Act as pantry steward; maintain cleanliness of pantry, pantry equipment, pots, pans, china, silver, and sponges; stow perishable canned, bottled, and boxed food-stuffs; draw stores and linens; prepare sandwiches, light food, and beverages; dispose of garbage.
- .34 Act as galley steward; maintain cleanliness of galley and galley equipment; and take necessary precautions to prevent food poisoning.
- .35 Act as watch steward; answer calls in pantry and wardroom; keep wardroom clean; set out food for officers on late watch; wash and sanitize dishes; keep pantry clean and orderly; announce meals and changes in uniform.
- .36 Care for officer's clothing.
- .37 Secure for sea in wardroom, pantry, and stateroom.
- .38 Perform daily and weekly cleaning routine of wardroom and stateroom.
- .39 Issue clean linen and make arrangements for changes in number of officers and guests when in port.

###### 2.00 Examination Factors

- .31 Identify insignia of rank, corps devices and types of uniforms of the Armed Services
- .32 Methods of food conservation, prevention of spoilage and poisoning.
- .33 Duties of wardroom, pantry, galley, watch, and head steward.
- .34 Organization and operation of wardroom mess.
- .35 Methods, materials, and schedule for cleaning, washing, and polishing equipment and spaces in officer's galley, wardroom, and quarters.
- .36 Methods of stowage of perishable boxed, bottled, and canned foods.
- .37 General organization of supply department.
- .38 Qualifications and requirements of rating to which stewardsmen may advance; names and abbreviations of remaining ratings.
- .39 Seating arrangements for officers and guests.

QUALIFICATIONS FOR ADVANCEMENT

G. SAFETY PRECAUTIONS - Continued

2.00 Examination Factors

Men Only

- .31 Safety precautions relating to gunnery operations, operation of machinery and power tools, working aloft and over the side, handling of boats, ammunition, pyrotechnics, and small arms; and entering holds, tanks, and voids; safety precautions relating to work with or near lifelines, ladders, scaffolding, heavy weights, weight-handling equipment; and to work with or near compressed gases and air, liquids under pressure, and steam.

Men and Women

- .32 Safety precautions to be observed in handling heavy weights, in the operation of electrical and electronic equipment, and when in the vicinity of, or when handling, flammables such as gasoline, fuel oil, and paint.

H. CARGO HANDLING (Men Only)

1.00 Practical Factors

None.

2.00 Examination Factors

- .31 Handling and stowing ammunition.
- .32 Nomenclature of equipment used in replenishment at sea.

QUALIFICATIONS FOR ADVANCEMENT

D. ADMINISTRATIVE AND/OR CLERICAL - Continued

2.00 Examination Factors - Continued

Women Only

- .34 Importance of logging incoming and outgoing mail in accordance with correct procedures; interpretation and preparation of bar and line graphs of two coordinates.
- .35 Standard format and abbreviations used for official letters, memorandums, endorsements, and messages; regulations to be observed in filing, duplicating, routing, and transporting classified matter.

E. RULES OF THE ROAD (Men Only)

1.00 Practical Factors

None.

2.00 Examination Factors

- .31 Rules of the Road for determining burden and privilege and for avoiding collision in meeting end-on, crossing, and overtaking situations; requirements of Rules of the Road for, and characteristics of, running and anchor lights.
- .32 Visual and sound ship distress and breakdown signals according to International and Inland Rules of the Road.
- .33 Sound signals for ships during reduced visibility according to International and Inland Rules of the Road.
- .34 Distinctive markings of channel buoys, obstruction buoys, and midchannel or fairway buoys in U. S. waters.

F. GUNNERY (Men Only)

1.00 Practical Factors

None.

2.00 Examination Factors

- .31 Duties of a sightsetter, pointer, trainer, and spotter in local and automatic control; meaning of the following commands: "stations", "load", "commence firing", "check firing", "resume fire", "cease fire", and "silence"; definition of separate loading and semifixed and fixed ammunition; paint markings on common shrapnel, armor-piercing, and tracer and illuminating ammunition, and general characteristics of each type; and parts of a shell and function of primer and fuze.

G. SAFETY PRECAUTIONS

1.00 Practical Factors

None.



## QUALIFICATIONS FOR ADVANCEMENT

### C. BOAT SEAMANSHIP (Men Only)

#### 1.00 Practical Factors

- .31 Identify small boats as appropriate to operating area.
- .32 Act as bowhook, sternhook, and boatkeeper in a boat; demonstrate proper method of mooring a boat alongside a ship, a pier, and a float.
- .33 Demonstrate ability to steer by compass.

#### 2.00 Examination Factors

- .31 Procedure for hoisting and lowering boat, including orders given, safety precautions, use of frapping, stopper, and steadying lines, and use of sea painter.
- .32 Boat hails, recalls, salutes, and etiquette.
- .33 Boat handling in heavy seas.
- .34 Maintenance of lifesaving equipment.
- .35 Procedures for dockside mooring and to boat booms.
- .36 Nomenclature of equipment used in anchoring and mooring a boat.
- .37 Duties of a boat coxswain.

### D. ADMINISTRATIVE AND/OR CLERICAL

#### 1.00 Practical Factors

##### Men and Women

- .31 Write or print legibly; correctly spell common Coast Guard terms.
- .32 Solve simple mathematical problems in addition, subtraction, multiplication, and division.
- .33 Assist in taking inventory by counting and reporting count.

##### Women Only

- .34 File material according to standard Coast Guard filing system.
- .35 Prepare a letter of personal concern, such as a request for assignment to a service school, using Coast Guard style and format.
- .36 Prepare requisitions for supplies and equipment.
- .37 Locate requested information in the following official publications:
  - a. U. S. Coast Guard Regulations (CG-300)
  - b. Coast Guard Personnel Manual (CG-207)
  - c. Enlisted Ratings Qualifications Manual (CG-311)
  - d. U. S. Navy Security Manual for Classified Matter, as amended for Coast Guard use.

#### 2.00 Examination Factors

##### Men and Women

- .31 Qualifications and requirements of ratings to which seamen may advance; names and abbreviations of remaining ratings.
- .32 Spelling of naval terms and authorized abbreviations used by the Coast Guard; good English usage, including punctuation, capitalization, quotation, hyphenation, formation of possessives and plurals.
- .33 Time zones in use in the United States and how to compute Greenwich civil time for both civilian and Coast Guard use.

QUALIFICATIONS FOR ADVANCEMENT

A. MARLINSPIKE AND DECK SEAMANSHIP (Men Only) - Continued

2.00 Examination Factors - Continued

- .35 Maintenance and repair of canvas.
- .36 Function, markings, and operation of engine order telegraph; function and operation of engine revolution telegraph.
- .37 Helmsman's terminology, orders to helmsman; principles of steering and procedures for relieving the helm.
- .38 Method of determining size of line and wire.

B. WATCHES

1.00 Practical Factors

Men Only

- .31 Stand watch as:
  - a. Messenger to officer of the deck
  - b. Side boy.
  - c. Lookout.
  - d. Helmsman.
  - e. Engine revolution telegraph operator.
  - f. Engine order telegraph operator.
  - g. Anchor watch.
  - h. Fire watch.
  - i. Fog watch.
  - j. Lifeboat crew member.
  - k. Telephone talker.
- .32 Take relative bearings; identify standard compass, steering compass, gyrorepeater, and pelorus.
- .33 Identify and demonstrate how to turn on the following ship's lights: masthead, range, starboard, port, anchor, breakdown, stern, towing, and deck standing.
- .34 Identify ship's call by flag hoist and signal light; send and receive simple messages in Morse Code by flashing light.

Men and Women

- .35 Stand the following watches:
  - a. Messenger to officer of the day.
  - b. Office telephone watch.
  - c. Fire and security watch to buildings and barracks.

2.00 Examination Factors

Men Only

- .31 Kinds of lookouts, lookout terminology and meaning of: position angle, lookout sector, compass bearing, relative and true bearings; difference between bearing by degrees and bearing by points; and difference between magnetic compass and gyrocompass.
- .32 Signal for man overboard and procedure for reporting a man overboard.
- .33 General orders for lookouts, sentries, messengers, and orderlies.

## SEAMAN (SN)

### GENERAL RATE

### SCOPE

Seamen maintain ship's compartments, decks, deck machinery and equipment, external structure, and lines and rigging; stand deck watches such as helmsman, lookout, and messenger watches underway and in port; stand sentry, fire, security, anchor, and other special watches; assist in maintenance of aids to navigation; man and operate small boats, booms, cranes, and winches; and act as members of guncrews and damage control parties. Women are usually assigned to duties which lead to ratings within the administrative and clerical fields. Women also serve as trainees in the fields of communications and of operation and repair of electronic, ordnance, and precision equipment. SPAR seamen stand security, fire, telephone, and messenger watches and perform general detail and other duties.

### QUALIFICATIONS FOR ADVANCEMENT

#### A. MARLINSPIKE AND DECK SEAMANSHIP (Men Only)

##### 1.00 Practical Factors

- .31 Heave a heaving line; coil-down, fake-down, and flemish-down a line; coil-down and fake-down a wire; and identify manila, sisal, cotton, and hemp lines as well as synthetic lines such as nylon.
- .32 Handle and care for manila, nylon, and wire rope; determine size of a line and of a wire.
- .33 Make a temporary and permanent whipping on a line; put a seizing on a wire; open a new coil of line; open a new coil of wire.
- .34 Tie a bowline, bowline on a bight, rolling hitch and clove hitch; pass a stopper; make an eye splice and short splice; tie a square knot, single and double becket bend and single and double carrick bend; know commands and demonstrate ability to handle mooring lines.
- .35 Bend gantline to a boatswain's chair for self-lowering; work aloft, observing safety precautions; bend gantlines to a stage, rig stage for lowering, work over the side and demonstrate ability to raise and lower stage while working from it, observing all safety precautions.
- .36 Identify and describe functions of ground tackle equipment, bits, chocks, towing pads, cleats, and leadsman's chains; binnacle, rudder, and angle indicator, engine speed indicator, revolution telegraph, and engine order telegraph.
- .37 Heave a lead line and know the markings.
- .38 Identify ship's frames, longitudinals, stem, decks, bulkheads, double bottoms, floors, cofferdams, superstructure, navigating bridge, shrouds, stays, flagstaff, jackstaff, gaff and yardarms; locate compartments by means of compartment designating symbols.
- .39 Prepare surfaces for painting; clean paint brushes and roller coaters.

##### 2.00 Examination Factors

- .31 Method of opening, and care of, line and wire coil.
- .32 Functions, nomenclature of parts, and operation of anchor windlass, boat booms, accommodation ladder, winches, cranes, capstans, and davits.
- .33 Types of anchors and names of ship's anchors.
- .34 Proper preservation and lubrication of standing rigging, running rigging, blocks, pelican hooks, turn buckles, falls, and weather deck equipment.

QUALIFICATIONS FOR ADVANCEMENT

D. ANATOMY AND PHYSIOLOGY

1.00 Practical Factors

None.

2.00 Examination Factors

- .31 Nomenclature, location and function of bones (osteology) and muscles (myology).
- .32 Elementary description and function of circulatory, respiratory, digestive and genitourinary systems.
- .33 Cell and tissue structure.

E. ADMINISTRATIVE

1.00 Practical Factors

- .31 Keep routine ward records.
- .32 Perform clinical recording and charting.

2.00 Examination Factors

- .31 Organization of medical department aboard own ship or station.
- .32 Routine ward records.

## HOSPITALMAN (HN)

### SERVICE RATE

### SCOPE

Hospitalmen train for the rating of Hospital Corpamen. They perform such duties as applying bandages and dressings; taking temperatures, pulses and respiration; collecting specimens; administering medications; performing routine ward care of patients; keeping medical department equipment and spaces clean and sanitary; and performing routine clerical duties of the ward.

### QUALIFICATIONS FOR ADVANCEMENT

#### A. FIRST AID

##### 1.00 Practical Factors

- .31 Apply various types of bandages, splints and dressings.
- .32 Give artificial respiration by using mouth-to-mouth resuscitation and other approved methods.
- .33 Administer first aid treatment.
- .34 Transport the wounded without litter by approved hand- or back-carry methods.

##### 2.00 Examination Factors

- .31 Elementary rules for first aid.
- .32 Types and uses of bandages and dressings.
- .33 Types and uses of splints.

#### B. HYGIENE AND SANITATION

##### 1.00 Practical Factors

- .31 Keep medical department equipment and spaces in clean and sanitary condition.

##### 2.00 Examination Factors

- .31 Methods and materials used in keeping medical department spaces in clean and sanitary condition.

#### C. PATIENT CARE

##### 1.00 Practical Factors

- .31 Administer medicine by various routes.
- .32 Give morning and evening care to bed patients.

##### 2.00 Examination Factors

- .31 Principles of nursing.
- .32 Clinical recording.
- .33 Collection of specimens.
- .34 General ward nursing methods and care of patients.
- .35 Administration of medicines and therapeutic treatment.

## QUALIFICATIONS FOR ADVANCEMENT

### J. DAMAGE CONTROL PUMPS, VALVES, AND PIPING - Continued

#### 1.00 Practical Factors

- .34 Start, operate, and secure: bilge pumps; fuel, oil, and water transfer systems.
- .35 Trace fire main and ventilation systems.
- .36 Repack valves and replace gaskets in piping systems.

#### 2.00 Examination Factors

- .31 Names and purposes of equipment found in the damage control locker.
- .32 Compartment numbering system used in the Coast Guard.
- .33 Types and principles of operation of portable pumps.
- .34 Use of pipe and tubing, thread system, valves and fittings, lagging, gasket and packing materials, greases, solvents, and oils.
- .35 Types and principle of operation of positive displacement; centrifugal and jet pumps.

### K. SAFETY PRECAUTIONS

#### 1.00 Practical Factors

- .31 Operate engineering equipment within safe range, as indicated by gages and other measuring instruments.

#### 2.00 Examination Factors

- .31 Safety precautions to be observed when:
  - a. Working around machinery.
  - b. Working around steam.
  - c. Working with or around electrical appliances and equipment.
  - d. Handling gasoline, fuel oil, other flammables, and toxic agents.

## QUALIFICATIONS FOR ADVANCEMENT

### G. INTERNAL COMBUSTION ENGINES - Continued

#### 2.00 Examination Factors

- .31 Development of internal combustion engines.
- .32 Types of internal combustion engines.
- .33 Methods and principles of combustion.
- .34 Nomenclature of parts and accessories used in internal combustion engine construction.
- .35 Minor engine troubles and their remedies.

### H. PRINCIPLES OF STEAM ENGINEERING

#### 1.00 Practical Factors

- .31 Operate equipment and systems used in steam generation and trace piping.
- .32 Start, operate and secure boiler.
- .33 Perform boiler water treatment procedures.

#### 2.00 Examination Factors

- .31 Principles of steam.
- .32 Maintenance of equipment and systems used in steam.
- .33 Principles of boiler operation.
- .34 Purpose of boiler water treatment.
- .35 Basic principles of ship propulsion.

### I. AUXILIARIES

#### 1.00 Practical Factors

- .31 Locate and identify refrigeration equipment, anchor windlasses, distilling plants, compressors, steering engines, cranes, elevators, and winches.
- .32 Start, operate and secure auxiliary equipment cognizant to engineering department.
- .33 Act as small boat engineer.

#### 2.00 Examination Factors

- .31 Function of the following auxiliary equipment: air compressors, distilling plants, fuel oil heaters, lube oil coolers, main and auxiliary condensers, air ejector condenser assembly, a.c. and d.c. generators and motors, and reduction gears.
- .32 Use and reading of gages and measuring instruments.

### J. DAMAGE CONTROL PUMPS, VALVES, AND PIPING

#### 1.00 Practical Factors

- .31 Identify and use equipment in damage control lockers.
- .32 Operate firefighting and dewatering pumps.
- .33 Identify pipe and tubing sizes, thread systems (NC, NF, Pipe); types of fittings and valves; lagging materials; gasket and packing materials; greases, solvents, and oils.

## QUALIFICATIONS FOR ADVANCEMENT

### C. BLUEPRINTS - Continued

#### 2.00 Examination Factors

- .31 Types and views of blueprints.
- .32 Basic understanding of draftsman's language.

### D. BASIC MACHINES

#### 1.00 Practical Factors

- .31 Identify and use basic machines.
- .32 Understand meaning of mechanical advantage, work, friction, efficiency, and horsepower.

#### 2.00 Examination Factors

- .31 Nomenclature used in basic machines.
- .32 Methods of calculating mechanical advantage, work, friction, efficiency, and horsepower.

### E. BASIC HYDRAULICS

#### 1.00 Practical Factors

- .31 Operate and maintain hydraulic equipment.

#### 2.00 Examination Factors

- .31 Development of hydraulics.
- .32 Types of hydraulic systems.
- .33 Advantages and problems of hydraulics.
- .34 Physical properties of liquids; principles of liquid flow.
- .35 Use of hydraulic systems based on pressure and force.
- .36 Functions performed and specifications of hydraulic liquids.
- .31 Operate and maintain electrical equipment.

#### 2.00 Examination Factors

- .31 Fundamental concepts of electricity.
- .32 Meaning of terms used in electricity.
- .33 Methods of producing voltage.
- .34 Types, principles, and care of batteries.
- .35 Types and operation of shipboard electrical equipment.

### F. RESERVED

### G. INTERNAL COMBUSTION ENGINES

#### 1.00 Practical Factors

- .31 Operate and maintain I.C. engines.



## FIREMAN (FN)

### GENERAL RATE

### SCOPE

Firemen are in training for engineering and certain hull ratings. As soon as a fireman's capabilities have been established, he may be designated as a striker for one of the following ratings: MM, BT, EN, EM, or DC. Firemen stand messenger, cold iron, and fire watches; clean engineering spaces and equipment; make minor repairs to engineering equipment; record readings of gauges; participate in general drills; and perform general detail duties.

### QUALIFICATIONS FOR ADVANCEMENT

#### A. ENGINEERING ORGANIZATION AND ADMINISTRATION

##### 1.00 Practical Factors

- .31 Know duties of fireman.
- .32 Have a thorough knowledge of billet structure of engineering department.
- .33 Stand required engineering watches.
- .34 Maintain logs making accurate entries.
- .35 Be capable of reading and updating departmental organization chart.
- .36 Identify and be familiar with purpose of BSTM; Commandant Instructions, Paint and Color Manual, and technical manuals and publications pertinent to engineering departments.

##### 2.00 Examination Factors

- .31 Procedures of watch standing.
- .32 Symbols and entries required in engineering operating logs.

#### B. GENERAL PURPOSE TOOLS

##### 1.00 Practical Factors

- .31 Identify hand and power tools and know their uses.
- .32 Demonstrate proper care of tools.

##### 2.00 Examination Factors

- .31 Identity and uses of hand and power tools.
- .32 Proper care of tools.

#### C. BLUEPRINTS

##### 1.00 Practical Factors

- .31 Read a three-view working drawing.
- .32 Demonstrate knowledge of locating blueprints, using filing system.
- .33 Use damage control drawings to locate principal valves in units piping systems.

## QUALIFICATIONS FOR ADVANCEMENT

### H. ORGANIZATION

#### 1.00 Practical Factors

None.

#### 2.00 Examination Factors

- .31 Organization and functions of Seabee units.
- .32 Major duties and responsibilities of each of the Group VI ratings.

### I. DEFENSIVE TACTICS

#### 1.00 Practical Factors

- .31 Serve as member of a fire team, demonstrating knowledge of positions in basic formations.
- .32 Demonstrate ability to field strip, care for, and use individual service weapons.
- .33 Maintain annual qualifications with service rifle.
- .34 Use, maintain, and stow Landing Party Equipment.
- .35 Demonstrate techniques of individual cover and concealment.
- .36 Use trip flares, pyrotechnics, and warning devices.
- .37 Use hand grenades.
- .38 Demonstrate proficiency in hand-to-hand combat techniques.

#### 2.00 Examination Factors

- .31 Duties of a perimeter guard.
- .32 Details of company defense organization and general elements of battalion defense organization.
- .33 Duties of a fire team leader.
- .34 Personal hygiene in the field.
- .35 Elements of field sanitation.

### J. SIGNALS

#### 1.00 Practical Factors

- .31 Recognize standard U.S.A. and typical international road signs.

#### 2.00 Examination Factors

None.

## QUALIFICATIONS FOR ADVANCEMENT

### D. AUTOMOTIVE EQUIPMENT

#### 1.00 Practical Factors

- .31 Perform prescribed operator's service checks on passenger vehicles and light trucks.
- .32 Change lamp and replace lamp fuses in automotive equipment.

#### 2.00 Examination Factors

None.

### E. TIRES

#### 1.00 Practical Factors

- .31 Change and repair tires on automotive equipment.

#### 2.00 Examination Factors

None.

### F. SAFETY

#### 1.00 Practical Factors

None.

#### 2.00 Examination Factors

- .31 Safety precautions to be observed while working near, in, or with:
  - a. Earthmoving, roadbuilding, and blasting operations.
  - b. Electric and automotive repair shops.
  - c. Electric wiring and equipment.
  - d. Stationary plants.
  - e. Paints, varnishes, and preservatives.
  - f. Carpenter shops and equipment.
  - g. Steelworker shops and equipment.
  - h. Plumbing, heating, and air conditioning shops and equipment.
  - i. Construction equipment maintenance and repair shops.

### G. MATHEMATICS

#### 1.00 Practical Factors

None.

#### 2.00 Examination Factors

- .31 Addition, subtraction, multiplication, and division of numbers, fractions, and decimals.

## CONSTRUCTIONMAN (CN)

### EMERGENCY RATE

#### SCOPES

Construction men are personnel in training for one of the emergency ratings of the Construction Group. They perform nonskilled duties in Construction Battalion activities; may perform, as strikers, apprentice duties of a specific construction group; stand prescribed watches ashore or at advanced shore bases; are trained in individual and small unit defense tactics.

#### QUALIFICATIONS FOR ADVANCEMENT

##### A. TOOLS

###### 1.00 Practical Factors

- .31 Select and use proper handtools to perform common and elementary tasks in:
  - a. Splicing and rigging manila and wire rope.
  - b. Carpentry.
  - c. Asphalt and concrete batching; paving operations.
  - d. Automotive servicing and repair.
  - e. Plumbing.
  - f. Electric wiring.

###### 2.00 Examination Factors

None.

##### B. DRAWINGS AND SKETCHES

###### 1.00 Practical Factors

- .31 Read simple sketches used in construction work.

###### 2.00 Examination Factors

None.

##### C. SURVEYING

###### 1.00 Practical Factors

None.

###### 2.00 Examination Factors

- .31 Duties of chainman and rodman in a surveying party.
- .32 Purposes and uses of chaining pins, tapes, and range poles.

## QUALIFICATIONS FOR ADVANCEMENT

### E. AIRCRAFT HANDLING - Continued

#### 2.00 Examination Factors

- .31 General methods of handling aircraft and the major types of handling equipment associated with each.

### F. AIRCRAFT SERVICING

#### 1.00 Practical Factors

- .31 Connect and disconnect external power cables for starting and servicing aircraft.
- .32 Service aircraft with oil, fuel, hydraulic fluid and air.
- .33 Wipe down, wash and wax aircraft.
- .34 Clean, service and handle aircraft servicing equipment.
- .35 Visually inspect aircraft to detect the presence of corrosion, rust and pitting.

#### 2.00 Examination Factors

- .31 Types and identifying characteristics of aviation fuel and hydraulic fluid.
- .32 Precautions to be observed in the selection and application of cleaning agents for plexiglass, fiberglass, rubber and fabric to prevent damage.
- .33 Toxic properties of aircraft cleaning materials.

### G. AVIATION HANDTOOLS

#### 1.00 Practical Factors

- .31 Select, use and care for common aviation handtools.
- .32 Use common measuring tools.
- .33 Draw and account for common aviation handtools.

#### 2.00 Examination Factors

- .31 Types of common aviation handtools and the capabilities and limitations of each.
- .32 Operating techniques and procedures for maintaining common aviation handtools.
- .33 Sources of instruction pertaining to the use and maintenance of aircraft special tools.

### H. AVIATION HARDWARE

#### 1.00 Practical Factors

- .31 Install common aircraft safety and locking devices.
- .32 Select and use common aircraft screws, nuts and bolts.

#### 2.00 Examination Factors

- .31 Types and purposes of common aircraft safety and locking devices.
- .32 Purpose and operating features of quick-release fasteners.
- .33 General identifying characteristics of common aircraft screws, bolts and nuts.

## QUALIFICATIONS FOR ADVANCEMENT

### C. AIRCRAFT AND AIRCRAFT EQUIPMENT

#### 1.00 Practical Factors

- .31 Read aircraft quantity, temperature and pressure gages.
- .32 Use airframe station numbering system in performing maintenance duties.
- .33 Handle and change aircraft batteries, observing necessary precautions to prevent damage.

#### 2.00 Examination Factors

- .31 Types and purposes of Coast Guard aircraft.
- .32 Designation system used for identifying aircraft.
- .33 Basic types of aircraft powerplants and powerplant accessories.
- .34 General types of aircraft electronic and armament equipment.
- .35 Basic types and purposes of aircraft gages and instruments.
- .36 General purposes of aircraft hydraulic, electrical, pneumatic and cable control systems.
- .37 Nomenclature of major structural components of aircraft.

### D. SURVIVAL EQUIPMENT AND EMERGENCY PROCEDURES

#### 1.00 Practical Factors

- .31 Don and check aviation-type inflatable life vest.
- .32 Don and adjust parachute harness.
- .33 Stow and handle parachutes, oxygen breathing equipment, and life rafts, observing necessary precautions to prevent damage.
- .34 Man the fire bottle during the fueling and starting of aircraft.

#### 2.00 Examination Factors

- .31 Types of aircraft survival equipment.
- .32 Types and operating features of personnel parachutes.
- .33 Procedures and equipment used to extinguish fires caused by hot brakes.
- .34 General procedures for gaining entrance to aircraft under emergency conditions.
- .35 Color marking system for vehicles used on airfields.
- .36 Standard markings used to identify dangerous areas on airfields.

### E. AIRCRAFT HANDLING

#### 1.00 Practical Factors

- .31 Direct aircraft using standard aircraft taxi signals.
- .32 Serve as a member of aircraft handling team.
- .33 Tie down and secure aircraft.
- .34 Man the brakes of aircraft being towed or pushed.
- .35 Make up tie-down lines.
- .36 Observe standard operating techniques and handling procedures when using mobile equipment around aircraft.
- .37 Clean, service and lubricate aircraft handling equipment.

AIRMAN (AN)

# 3  
*General Rate*  
~~SERVICE RATE~~

SCOPE

Airmen assist in the maintenance of aircraft and associated aeronautical equipment and in the maintenance of aircraft support equipment; service and clean aircraft; assist in aircraft handling; and perform other apprenticeship duties required in the operation of Coast Guard aviation activities.

QUALIFICATIONS FOR ADVANCEMENT

A. SAFETY

1.00 Practical Factors

.31 Observe safety precautions when:

- a. Working in and around and around aircraft, particularly those related to liquid oxygen, propellers, turbine engine intakes and exhausts, rotary wings and high-pressure tires.
- b. Servicing aircraft, particularly in connection with fueling operations.
- c. Using and handling aviation tools, equipment and material.
- d. Handling or working around aviation ordnance and pyrotechnics.
- e. Crossing airfield runways, taxiways, parking ramps and work areas while in mobile equipment.

2.00 Examination Factors

None.

B. COAST GUARD AVIATION ORIENTATION

1.00 Practical Factors

None.

2.00 Examination Factors

- .31 Mission of U.S. Coast Guard aviation.
- .32 General organization of Coast Guard aviation.
- .33 Names and general functions of departments of a typical Coast Guard air station, and division of the maintenance department.
- .34 Basic theory of fixed and rotary wing flight.
- .35 Common aviation terms and nomenclature.
- .36 Names, abbreviations and general responsibilities of the aviation enlisted ratings.

# GENERAL RATES

Airman	AN
Constructionman	CN
Fireman	FN
Hospitalman	HN
Seaman	SN
Stewardsman	TN



DY Holder of International Driver's license

ZZ Extraordinary Talent

Eligibility. Possess an extraordinary talent such as musician, artist, athlete, etc.

Requirements. Certification by commanding officer that individual has an extraordinary talent not usually possessed by the average individual.

★ DI Enlisted District Staff Inspectors

Eligibility. Enlisted personnel assigned to the District Inspection Staffs of all Coast Guard Districts. Must be assigned for a period of one (1) year or more.

Requirements. Regularly perform field operational evaluation inspections, preparation of correspondence and inspection reports, and such other duties as may be assigned.

★ RT Recruiter

Eligibility. Must have satisfactorily served on recruiting duty for a period of two (2) years.

Requirements. Must be experienced in the operational requirements for recruiting set forth in the Personnel Manual (CG-207) and Manual for Recruiters (CG-148).

★ CC Career Information and Counselor

Eligibility. Completion of a Career Information and Counselor Training Course (USN-CIAC Course).

Requirements. Counsel personnel in all aspects relating to career information and conduct rehabilitation interviews.

★ DJ Driving Examiner.

Eligibility. Hold ratings of PO1, or above, and be qualified by the Civil Service Commission, American Automobile Association, or any of the Armed Services, according to their procedures for qualifying examiners.

Requirements. Be a qualified driving examiner able to conduct tests of potential Coast Guard drivers. Instruct personnel in safe, efficient and economical operation of motor vehicles.

Motor Vehicle Operator

Eligibility. Hold a valid U.S. Government Motor Vehicle Operator's Identification Card, or International Driver's license issued by the American Automobile Association.

★ DR Passenger, pickup, panel trucks

★ DS Trucks over 3/4 ton (includes DUKW's operated on a highway)

★ DT Semi-trailer, single axle

★ DU Semi-trailer, tandem axle

NOTE. In assigning any of the above four (4) qualification codes assign the code for the largest type of vehicle which an individual is qualified to operate, i.e. if licensed to operate a Semi-trailer, single axle, do not assign codes for passenger, pickup, panel trucks, or trucks over 3/4 ton.

★ DW Buses

★ DX Emergency vehicles

RI Resident Inspector

Eligibility. All engineering ratings who qualify by having satisfactorily served a minimum of nine months at a resident inspection office for the construction of new vessels and having been certified as qualified by the commanding officer.

Requirements. Performs such duties as, but not limited to, vessel inspection, preparation of correspondence and reports, and such other duties as may be assigned.

SI Small Arms Marksmanship Instructor

Eligibility. Be certified as National Rifle Association instructor and be qualified as Coast Guard distinguished marksman or National Rifle Association master classification in either rifle or pistol.

Requirements. Instruct coastguardsmen in the safe handling and proper use of service small arms. Coach personnel in marksmanship techniques.

ST Instructor

Eligibility. Completion of appropriate resident Class C service school, or on-the-job training at a Coast Guard training command if certified qualified.

Requirements. Teach coastguardsmen as individuals or teams in subject matter for which qualified by experience or training; prepare lesson plans; develop training aids; use audio-visual instruction equipment.

XI Investigator

Eligibility. Completion of resident training at the Treasury Law Enforcement School, the U. S. Air Force Investigator School, or other appropriate training courses of the armed forces, and serve satisfactorily for a three-month period following training at a Coast Guard Intelligence Office.

Requirements. Conduct investigations of all types over which Coast Guard Intelligence has cognizance, including personnel security, criminal, complaint, law enforcement and physical security.

Requirements. Trained in the maintenance of discipline and the development of qualities of character and leadership of men under his command; instruct in leadership courses.

MO Motion Picture Projector Operator

Eligibility. Completion of resident Class C service school.

Requirements. Operate 16-mm motion picture projects. Perform operator servicing of equipment and film. Maintain necessary records.

PO Polygraph Operator (Draft No. 1--Present DOD/CG Standards)

Eligibility. U. S. citizen at least 25 years of age. To be selected for training, a candidate must be a graduate of an accredited college (Baccalaureate degree) plus having two years as an investigator with a recognized government agency; or have satisfactorily completed two years' training at an accredited college (a minimum of 60 semester hours or an advance standing as a junior); or the equivalent of two years of college, as defined by the Head of the DOD Component concerned, plus five years investigative experience. Be of high moral character and sound emotional temperament as determined through successful screening on the basis of a background investigation. Completion of the resident course for DOD polygraph operators and serve an apprenticeship of at least six months before being certified.

Requirements. Conduct polygraph examinations as directed and required in the course of Coast Guard Intelligence investigations.

PO Polygraph Operator (Draft No. 2--Standards to be proposed by CG)

Eligibility. Pay grade E-6, or senior; have at least five years' active service; have been on duty as an active Coast Guard investigator for at least one year, and have a minimum of one year's college education. The U. S. Armed Forces Institute General Educational Development College Level Test, successfully completed, will be accepted as the equivalent of one year of college. Completion of the resident course for DOD polygraph operators and serve an apprenticeship of at least six months before being certified qualified.

Requirements. Conduct polygraph examinations as directed and required in the course of Coast Guard Intelligence investigations.

NOTE: Draft No. 1 provides the existing standards for polygraph operators. They are the Department of Defense standards and Coast Guard is bound by them at this writing. Since eligibility criteria is so high, the Coast Guard has no qualified polygraph operators at this time. Draft No. 2 presents the standards deemed adequate for the Coast Guard and approval of the lesser standards will be sought once the Department of Transportation changeover is completed.

Requirements. Process applications for merchant seaman's documents; administer examinations to unlicensed merchant seamen for such ratings as QMED, AB, lifeboatman; demonstrate knowledge of regulations pertaining to the certification of seamen; provide additional assistance to the senior inspector of personnel as required.

H7 Marine Inspection, Investigating Unit Court Reporter

Eligibility. Qualify by on-the-job training when certified as qualified by an officer-in-charge, marine inspection. Eligible personnel are yeomen who are qualified as either "court reporter, stenographic" or "court reporter, closed microphone."

Requirements. Records proceedings of Administrative Hearings which look to the suspension or revocation of Coast Guard issued documents and/or licenses; demonstrates knowledge of laws, regulations, and applicable Coast Guard directives dealing with casualty and personnel investigations; records proceedings of casualty investigations and Marine Boards of Investigations.

H8 Marine Inspection, Clerical Assistant to the OCMI

Eligibility. Qualify by on-the-job training for a period not less than two years under the direction of the officer-in-charge, marine inspection, to be certified qualified by that officer upon completion of the specified training period. YN.

Requirements. Possess familiarity with all laws, regulations and Coast Guard directives which concern the specific mission area of Merchant Marine Safety; demonstrate mature judgment in the various contacts with representatives of the marine industry that are required by the incumbent of this billet; supervise the preparation of the various official documents related to the inspection of vessels.

H0 Helicopter Landing Signal Officer (LSO)

Eligibility. Successful completion of on-the-job training in helicopter-ship operations, including a proficiency check conducted by a shipboard qualified helicopter pilot under actual conditions. Additional training at an air station is encouraged but not required. Certified qualified by ship commanding officer upon the recommendation of the aviator conducting proficiency check.

Requirements. Under cognizance of ship commanding officer and with concurrence of aircraft commanders, controls through authorized signals the operation of helicopters while taxiing, taking off, landing, hovering, and otherwise maneuvering on or in the proximity of flight decks aboard ship. Acts as representative of ship commanding officer to assure safe and coordinated flight deck operations.

LD Leadership

Eligibility. Completion of resident Class C Coast Guard or Navy leadership course.

Requirements. Assist deck marine inspector in conducting required life-saving and firefighting equipment inspections on board vessels subject to vessel inspection laws; demonstrate knowledge of pertinent federal regulations; exhibit mature judgment in contact with members of marine industry.

H2 Marine Inspection, Engineering Inspector's Assistant

Eligibility. Qualify by on-the-job training if certified to be qualified by an officer-in-charge, marine inspection. EN, EM, MM, BT.

Requirements. Assist engineering marine inspector in conducting required engineering inspections on board vessels subject to vessel inspection laws; demonstrate knowledge of pertinent federal regulations; exhibit mature judgment in contacts with members of the marine industry.

H3 Marine Inspection, Factory Inspector

Eligibility. Qualify by on-the-job training if certified to be qualified by an officer-in-charge, marine inspection. BM, GM, QM, DC, EN, EM, MM, BT.

Requirements. Conduct tests and inspections on USCG approved equipment at the site of manufacture and/or overhaul pursuant to federal regulations; exhibit mature judgment in contacts with the affected representative of industry.

H4 Marine Inspection, Deputy Shipping Commissioner

Eligibility. Qualify by on-the-job training if certified to be qualified by an officer-in-charge, marine inspection. EN, EM, MM, BT, DC, SK, YN, BM, GM, QM, RD, SO.

Requirements. Officially witness sign-on/sign-off transactions and process the shipping articles; review official log books; demonstrate knowledge of applicable laws and regulations affecting merchant seamen; exhibit mature judgment in contacts with members of the marine industry.

H5 Marine Inspection, Licensing Assistant

Eligibility. Qualify by on-the-job training if certified to be qualified by an officer-in-charge, marine inspection. BM, QM, EN, MM, BT, YN, RD, SO, SK.

Requirements. Process applications for merchant marine officers and operators licenses; administer specified practical and open-book examinations to license applicants; demonstrate knowledge of applicable portions of regulations pertaining to licensing; provide additional assistance to the senior inspector of personnel as required.

H6 Marine Inspection, Seamen Certification Assistant

Eligibility. Qualify by on-the-job training if certified to be qualified by an officer-in-charge, marine inspection. BM, QM, EN, MM, BT, YN.

G4 Computer Operator; Peripheral Equipment Operator

Eligibility. Satisfactory completion of a contractor introductory course on data processing principles of computer operating and on-the-job training to a demonstrated acceptable level of competence.

Requirements. Must be able to handle input and output material such as card decks, paper tapes, magnetic tapes, disk packs, etc., for computer peripheral equipment. Must be able to set up and unload material to be used on the equipment and to determine, in the event of machine stops, whether failures are machine malfunctions or not. Must be able to load programs and set up jobs under direction of a computer console operator. Should be able to run programs on any small-scale computer or a small medium-scale single-process computer. Should be able to read and use documentation of equipment set up to run jobs from start to finish.

G5 Computer Console Operator

Eligibility. Satisfactory completion of a contractor introductory course or console operator course and on-the-job training to an acceptable level of proficiency.

Requirements. Must be able to run all programs at an installation. Should have the ability to monitor the control console and start corrective procedures for any individual program according to predefined standard procedures if anything unusual occurs during processing. Must be able to distinguish machine malfunctions from program failure. Should know standard methods of restarting programs from check points. Must know how to prepare all input/output units with the proper material. Should have ability to assign and schedule input/output functions if using a computer with multi-processing capabilities.

G6 Computer Programmer

Eligibility. Satisfactory completion of contractor's basic computer programming course for specific system or an equivalent course.

Requirements. Must be able to convert program specifications, statements of purpose, and/or flow charts and/or block diagrams to machine processable instructions. Must be able to document programs for running of computer by others. Must be able to test and debug programs and determine when a program is finished and fulfills its purpose. Should have a general knowledge of programming aids and utility programs, such as sort/merge utility, card-to-tape utility, tape to printer utility, snapshot routine, trace routine, etc.. Should be able to run computer.

H1 Marine Inspection, Deck Inspector's Assistant

Eligibility. Qualify by on-the-job training if certified to be qualified by an officer-in-charge, marine inspection. BM, QM, DC, CM.

G3

Data Processing Machine Operator

Eligibility. Satisfactory completion of key punching course, plus course on at least one of the following: sorter, interpreter, collator, reproducer, accounting machine.

Requirements. Ability to keypunch and perform other data processing tasks.



Requirements. Work underwater to the level of qualification achieved. Diver's work may include search and recovery, inspection, minor construction and ship repair, clearing lines, salvage, demolition, use of underwater tools, and health and safety aspects of diving.

Level of Qualification

E4 SCUBA Diver  
E5 Diver Second Class  
E6 Diver First Class  
E7 Master Diver

EP Expert Marksman

Eligibility. Qualify as expert rifleman or expert pistol shot with the service rifle or pistol. Requalification not required.

Requirements. Fire the service rifle or pistol with the proficiency necessary to qualify as expert rifleman or expert pistol shot.

★ F1 Nuclear, Biological, and Chemical Warfare Defense Specialist (Ashore).

Eligibility. Completion of: Nuclear Biological, and Chemical Warfare Defense Ashore School.

Requirements. Coordinates disaster control operations, within own activity, to provide information on **radiological** monitoring and survey; biological and chemical weapons and effects; protective measures and decontamination methods; biological, chemical, and nuclear accident control; and disaster control planning and operation.

G1 AMVER Watchstander

Eligibility. Sufficient experience and on-the-job training to an acceptable level of proficiency.

Requirements. Ability to prepare AMVER inputs for entry into computer, to perform correlation process, and to produce and transmit output to users. Must be familiar with standard procedures, including those applicable to communications.

G2 AMVER Watch Supervisor

Eligibility. Sufficient experience as AMVER watchstander and computer console operator, satisfactory completion of contractor basic computer course for specific system, and on-the-job training to a demonstrated level of proficiency.

Requirements. Be thoroughly familiar with the AMVER watch routine, plotting procedures, and computer programs. Be able to analyze nonroutine occurrences and identify appropriate action with respect to programs or equipment. Exhibit leadership qualities necessary.

**E1**    Explosive Loading - Supervisor

Eligibility. Satisfactory completion of appropriate Coast Guard resident school. Previous training if considered qualified. On-the-job training if certified qualified.

Requirements. (1) Familiarity with Rules and Regulations for Military Explosives and Hazardous Munitions, CG-108. (2) Ability to supervise and/or experience in vessel pre-loading inspection, stowage compatibility, and cargo handling gear inspection. (3) Familiarity with safe methods for loading and stowing explosives, and (4) Knowledge of procedures for handling damaged explosive containers.

**EA**    Explosive Loading - Hatch Supervisor

Eligibility. Satisfactory completion of appropriate Coast Guard resident school. Previous training if considered qualified. On-the-job training if certified qualified.

Requirements. Familiarity with safe loading and stowage practices as they apply to hatch supervision, including knowledge of shoring, tomming, and tiering. Desire that man has had experience as a member of a supervisory detail.

**E2**    Enlisted Engineer Officer

Eligibility. The senior engineering rating permanently assigned by the district commander or commanding officer of a Headquarters unit to vessels 65 feet and over which are listed in OPFAC to serve in the capacity of engineer officer where no commissioned or warrant engineer billet is authorized. Must be certified as qualified on type of vessel to which assigned having served a minimum of 12 months on board and recommended by the commanding officer or district engineer.

Requirements. Performs duties comparable to commissioned and warrant engineer officers as prescribed by current Headquarters, district and vessel directives.

**E3**    Machine Shop Equipment Operator

Eligibility. Graduate of U.S. Naval Machinery Repairman School (Class A or B as appropriate). All engineering ratings may also qualify by satisfactorily completing the applicable equipment operator correspondence course and by demonstrating the ability to set up, operate and maintain small machine shop equipment and attachments including lathes, grinders, drill presses, shapers, and milling attachments; be proficient in the use of precision measuring instruments and tools, and have a basic knowledge of metal testing and tempering.

Requirements. Operate and maintain basic shipboard machine shop equipment.

Diver

Eligibility. Completion of appropriate Class C service school and qualified in accordance with published instructions. Maintain qualification current in accordance with published instructions.

bulk or other dangerous cargoes as covered by 46 CFR 146 and 46 CFR 30-40. Be knowledgeable of marine firefighting techniques concerning vessel and shoreside cargo storage and handling areas.

DM Draftsman

Eligibility. Previous training or experience and on-the-job training upon certification by the district commander.

Requirements. Prepares construction drawings from rough sketches, gathers information and dimensions from existing structures to aid in preparation of drawings, prepares "as built," operates reproduction machines and maintains drawing files.

QUARTERMASTER (QM)

GENERAL RATING

SCOPE

Quartermasters stand watch as assistants to officers of the deck and to the navigator; serve as helmsman and perform ship control, navigation, and bridge watch duties; procure, correct, use and stow navigational and oceanographic publications and oceanographic charts; maintain navigational instruments and keep correct navigational time; render "honors and ceremonies" in accordance with national observance and foreign customs; send and receive visual messages; and serve as petty officers in charge of tugs and patrol boats.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
QM

A. SIGNALS AND MESSAGES

1.00 Practical Factors

- .01 Recognize all visual signal flags and pennants; know order of reading flag hoist and significance of dipped, close up, and hauled down . . . . . E-4
- .02 Make and recognize whistle, bell, and flag and light signals pertaining to fog, collision, fire, breakdown, man overboard, international distress, and storm warnings . . . . . E-4
- .03 Identify and give meanings of aircraft, surface ship, and submarine emergency signals . . . . . E-4
- .04 Transmit and receive on voice radio, using proper radiotelephone procedures . . . . . E-4
- .05 Transmit and receive the following, using standard naval signaling procedures: (See Performance Test Instructions)
  - a. Code groups by flashing light at an approximate speed of 6 groups of 5 characters a minute for three minutes (6 WPM). Allowable errors - 2 . . . . . E-4
  - b. Plain language messages by flashing light at an approximate speed of 40 characters a minute for 3 minutes (8 WPM). Allowable errors - 1 . . . . . E-4
  - c. Plain language messages by semaphore at an approximate speed of 75 characters a minute for 2 minutes (15 WPM). Allowable errors - 2 . . . . . E-4
- .40 Construct any "commander" or "collective" call sign, using type and unit indicators . . . . . E-5

2.00 Examination Factors

- .01 Storm warning signals, emergency signals, signals to lifeboats and aircraft and international distress signals made by flag or light . . . E-4
- .02 Distinction between a call and a signal in a flaghoist. Order of reading a flaghoist and significance of dipped, closeup, and haul down . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
QM

A. SIGNALS AND MESSAGES - Continued

2.00 Examination Factors - Continued

- .03 Operating procedures used in identification, correction, repetition, acknowledgement, verification, and cancellation of messages and flaghoist signals . . . . . E-4
- .04 Operating signals, prosigns, and message structure used in visual communications . . . . . E-4
- .40 Construction and use of all visual call signs, international call signs, and task organization calls for ships and commands . . . . . E-5
- .41 Meanings and methods of displaying single flags and pennants, and governing groups and pennants . . . . . E-5
- .42 Rules of visual responsibility in passing and relaying messages and flaghoist signals . . . . . E-5
- .43 Navy and international flaghoist procedure . . . . . E-5
- .60 Responsibilities of the originator of visual messages . . . . . E-6
- .80 Various types of messages: general, single and multiple address, basegrams, and special categories . . . . . E-7

B. PREPARATION AND SERVICING OF MESSAGES

1.00 Practical Factors

- .01 Prepare a visual message for transmission, using proper form . . . . . E-4
- .02 Service a message: convert visual or radio headings into plain language according to addresses, precedence, routing, and special instructions . . . . . E-4
- .40 Encode and decode any naval or international signal contained in effective visual communication publications . . . . . E-5
- .60 Use provisions of Reserve On Board signaling and recognition publications to draft a message or recognition signal under simulated wartime conditions . . . . . E-6

2.00 Examination Factors

- .01 Significance of precedence in handling and routine messages . . . . . E-4
- .02 Message structure, including all components . . . . . E-4
- .03 Challenge and reply procedures . . . . . E-4

C. HONORS AND CEREMONIES

1.00 Practical Factors

- .01 Render passing and side honors . . . . . E-4
- .02 Identify national and merchant flags of principal maritime and major naval powers and personal flags of the U. S. . . . . E-5
- .40 Dress and full-dress a ship . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to

C. HONORS AND CEREMONIES - Continued

2.00 Examination Factors

- .01 Passing and side honors rendered by and on naval vessels . . . . . E-4
- .40 Prescribed shipboard honors and ceremonies accorded to visiting officers, officials and dignitaries. . . . . E-5
- .41 Rules governing display of U. S. ensign, U. N. flag, personal flags and flags of civil officials . . . . . E-5

D. STEERING

1.00 Practical Factors

- .01 Shift to emergency methods of steering and control . . . . . E-4
- .02 Qualify as helmsman observing standard procedures for acknowledging orders to wheel, and for making reports to conning officer during execution. Shift steering control stations. . . . . E-4
- .40 Set up zigzag plans and/or the sinuous course clock for use in evasive steering . . . . . E-5
- .41 Steer ship in restricted waters; when making landings; and when going alongside or replenishing and making transfers at sea. . . . . E-5
- .60 Maneuvering in restricted spaces, effects of propellers, rudder, wind and current. . . . . E-6

E. MAGNETIC COMPASS AND GYROCOMPASS

1.00 Practical Factors

- .01 Provide speed and latitude data to gyroelectrician for gyrocompass correction . . . . . E-4
- .60 Adjust magnetic compass. Determine deviation by use of azimuth of sun, reciprocal bearings, visual ranges, distant objects and gyrocompass. Prepare deviation tables . . . . . E-6

2.00 Examination Factors

- .01 Causes, kinds and significance of compass errors. Precautions to be observed in vicinity of magnetic compass. Comparison of gyrocompass with standard compass. . . . . E-4

F. DEGAUSSING

1.00 Practical Factors

- .01 Apply corrections to degaussing coils due to changes in course . . . . . E-4
- .40 Read and interpret degaussing charts. Make settings or provide information for settings to the electricians . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
QM

F. DEGAUSSING - Continued

2.00 Examination Factors

- .40 Procedures for running degaussing ranges . . . . . E-5

G. RULES OF THE ROAD

1.00 Practical Factors

None.

2.00 Examination Factors

- .01 Meaning and significance of General Prudential Rule and Rule of Good Seamanship . . . . . E-4
- .02 Determining burdened and privileged vessels in meeting, crossing and overtaking situations . . . . . E-4
- .03 Determining risk of collision by repeated bearings and ranges. . . . . E-4
- .04 International and inland rules of the road requirements for:
  - a. Running, towing, not under command or breakdown lights . . . . . E-4
  - b. Anchor lights and shapes . . . . . E-4
  - c. Steering and sailing rules . . . . . E-4
  - d. Sound fog, danger and distress signals . . . . . E-4
  - e. Vessels navigating narrow channels, approaching a bend, and leaving a berth. . . . . E-4
- .40 International and inland rules of the road requirements for special lights and/or shapes shown by:
  - a. Fishing and sailing vessels. . . . . E-5
  - b. Vessels engaged in laying or picking up cable or aids to navigation, or in surveying or underwater operations . . . . . E-5
  - c. Vessels aground, pilot vessels, ferryboats, barges and canalboats in tow. . . . . E-5
- .41 General rules for establishing the boundary lines of inland waters . . . . . E-5
- .60 Special nighttime and daytime signals displayed by minesweepers . . . . . E-6
- .61 Requirements of Pilot Rules for inland waters. . . . . E-6
- .62 General contents and use of Boarding Manual (CG-253) . . . . . E-6

H. TIME AND TIMEPIECES

1.00 Practical Factors

- .01 Compute sunrise and sunset and moonrise and moonset from nautical almanac and/or air almanac . . . . . E-4
- .02 Obtain chronometer time tick; differentiate between zone time, Greenwich mean time (GMT), and local mean time . . . . . E-4
- .03 Wind chronometers daily at the proper time and make appropriate report . . . . . E-4
- .04 Take and work time for navigator . . . . . E-4
- .40 Determine time of local apparent noon. . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
QM

H. TIME AND TIMEPIECES - Continued

2.00 Examination Factors

- .01 Theory and system of time zones, relation of arc to time, time to arc; kinds of time; conversion of zone time, local mean time, and Greenwich mean time . . . . . E-4
- .02 Computation of sunrise and sunset, and moonrise and moonset from nautical almanac . . . . . E-4
- .40 Factors which affect accuracy of chronometers . . . . . E-5
- .41 Method of recording chronometer data in chronometer record books . . . . . E-5

I. NAVIGATION AND RELATED EQUIPMENT

1.00 Practical Factors

- .01 Set up and use bearing circle, azimuth circle, alidade, and stadimeter for obtaining navigational data; observe and work an azimuth of the sun . . . . . E-4
- .02 Use parallel rules, protractors, and dividers for plotting navigational information . . . . . E-4
- .03 Operate echo sounder (fathometers); mark echogram and annotate for time, course, and speed changes; enter soundings in sounding journal . . . . . E-4
- .04 Take, record, and plot visual and radar bearings . . . . . E-4
- .05 Determine position by use of radar . . . . . E-4
- .06 Maintain, handle, and stow navigational equipment . . . . . E-4
- .07 Obtain, read, and plot loran line of position . . . . . E-4
- .39 Determine position by the following:
  - a. Dead reckoning . . . . . E-4
  - b. Soundings . . . . . E-5
- .40 Identify stars, using Star Finder (H.O. 2102-D) and the Sight Reduction Tables (H.O. 249) . . . . . E-5
- .41 Observe and work an amplitude of the sun . . . . . E-5
- .42 Prepare memoranda requests for survey and for requisition of equipment . . . . . E-5
- .60 Use navigator's instruments and determine line of position by celestial observations . . . . . E-6
- .61 Maintain custody record cards and inventory files for navigational equipment . . . . . E-6
- .62 Plan a voyage of at least 1000 miles with coastal piloting and an ocean passage . . . . . E-6
- .80 Serve as assistant to navigator. Perform day's work in navigation . . . . . E-7
- .81 Adjust and align sextants . . . . . E-7

2.00 Examination Factors

- .01 Methods for determining ship's speed through the water and over the ground . . . . . E-4
- .02 Theory and methods of applying compass error to obtain compass course and true course . . . . . E-4
- .03 Precautions to be observed in safe handling and stowage of navigational and signaling equipment . . . . . E-4



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
QM

I. NAVIGATION AND RELATED EQUIPMENT - Continued

2.00 Examination Factors - Continued

.04	Methods of determining position by soundings and obtaining running fix by bow and beam bearings . . . . .	E-4
.39	Methods of determining position by:	
	a. Dead reckoning . . . . .	E-4
	b. Bearing and distance of a single object. . . . .	E-4
	c. Cross bearings of two or more objects. . . . .	E-4
	d. Two or more ranges . . . . .	E-4
	e. Two horizontal angles between three objects. . . . .	E-5
.40	Use of loran and radar aids to navigation. . . . .	E-5
.60	Use of danger angles and danger bearings . . . . .	E-6
.61	Determination of deviation by use of: azimuth of sun, reciprocal bearings, visual ranges and gyrocompass. . . . .	E-6
.62	Method of determining Greenwich hour angle, local hour angle and meridian angle and of determining position from celestial observations. . . . .	E-6
.63	Use of tactical characteristics in piloting. . . . .	E-6
.80	Daily routine of navigator at sea. . . . .	E-7
.81	Limitations of radar and loran aids to navigation; uses of radio direction finding (RDF) equipment. . . . .	E-7

J. VISUAL AIDS TO NAVIGATION

1.00 Practical Factors

None.

2.00 Examination Factors

.01	Distinguishing characteristics of lights and other related visual aids to navigation. . . . .	E-4
.02	Use of tables in determining range and visibility of lights. . . . .	E-4
.39	Types of buoys and significance of their markings, numbering, lighting and sound signals:	
	a. U. S. system of buoyage. . . . .	E-4
	b. Cardinal and lateral systems of buoyage as employed by principal maritime nations . . . . .	E-5

K. WEATHER

1.00 Practical Factors

.01	Determine true wind from apparent wind . . . . .	E-4
.02	Make up numerical-code weather messages, using current publication . . .	E-4
.60	Interpret synoptic weather, wave and ice charts and related messages . .	E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
QM

K. WEATHER - Continued

2.00 Examination Factors

- .01 Use of wet- and dry-bulb thermometers in determining humidity. . . . . E-4
- .40 Relative accuracy of an aneroid barometer. . . . . E-5
- .41 Significance of dew point, relative humidity, temperature, atmospheric pressure, wind force and direction, cloud formation, and sea state in general weather forecasting. . . . . E-5
- .80 Laws of cyclonic storms, including probably path and location of storm center. Indications of an approaching storm and action to be taken to avoid storm center . . . . . E-7

L. WATCHSTANDING

1.00 Practical Factors

- .01 Stand watches as quartermaster of the watch underway and in port . . . . E-4
- .02 Locate and operate during darkness, switches for navigation lights, anchor and emergency lights. . . . . E-4
- .03 Make bridge preparations for getting the ship underway; test engine order telegraph, annunciator, steering control, ship's whistle, and alarms for operation . . . . . E-4
- .40 Solve basic maneuvering board problems in course, speed, closest point of approach (CPA), and time. . . . . E-5
- .60 Set up maneuvering board to indicate tactical organization and disposition of own force . . . . . E-6
- .61 Perform duties of Junior Officer of the Deck . . . . . E-6

2.00 Examination Factors

- .80 Duties of executive officer of "second in command" on WPB class patrol boats. . . . . E-7

M. MAINTENANCE, REPAIR AND SAFETY

1.00 Practical Factors

- .01 Perform routine upkeep of visual signaling equipment . . . . . E-4
- .02 Reeve and splice halyards. . . . . E-4
- .40 Make and repair signal and personal flags and pennants; repair ensigns and jacks. . . . . E-5

2.00 Examination Factors

- .01 Care of optical equipment, flags and halyards. . . . . E-4
- .02 Safety precautions to be observed in the use of infrared, mercury-xenon, and pyrotechnic signaling equipment. . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
QM

N. ADMINISTRATION

1.00 Practical Factors

- .01 Maintain visual signal log and visual traffic files . . . . . E-4
- .02 Correct and maintain signal publications . . . . . E-4
- .03 Obtain data and make entries in the bearing record book, compass record book, quartermaster's notebook and Weather Observation Sheet, using standard terminology, phraseology, and symbols for wind, weather, sea, and clouds . . . . . E-4
- .04 Correct and stow Sailing Directions, Light Lists, Coast Pilots, and related publications . . . . . E-4
- .05 Correct and stow charts; and identify symbols used on navigational charts . . . . . E-4
- .06 Record daily data in chronometer record books . . . . . E-4
- .07 Use and apply data contained in Coast Pilots, Sailing Directions, Light Lists, Tide and Current Tables, and related publications commonly used in solving navigational problems . . . . . E-4
- .08 Inventory and procure charts and publications . . . . . E-4
- .60 Obtain information and prepare the following oceanographic reports for shipments in accordance with current directives: echograms, wave observation log, ship's ice log, sounding journal, and adjusted track charts . . . . . E-6
- .61 Compute data monthly in chronometer record books . . . . . E-6

2.00 Examination Factors

- .01 Names, uses, contents, and sources of supply of standard signal publications . . . . . E-4
- .02 Security precautions to be observed in handling and stowing classified matter and recognition signals . . . . . E-4
- .03 Use of the Naval Signal Book and interpretation of its contents . . . . . E-4
- .04 Source of data for, and entries required in, ship's log; standard terminology and phraseology of entries in quartermaster's notebook . . . . . E-4
- .40 Names and uses of chart projections and scales . . . . . E-5
- .60 Names, uses, and types of navigational publications and information supplied by Oceanographic Office, Naval Observatory, Bureau of Naval Personnel, and Environmental Science Service Administration. . . . . E-6
- .80 Use of, and time retention (onboard) requirements on signal station file, visual log, radio central message file, radio station file, tickler file, and radio circuit logs . . . . . E-7

O. SUPERVISION

1.00 Practical Factors

- .40 Supervise bridge personnel at general quarters and during regular steaming watches . . . . . E-5
- .60 Supervise and train personnel in navigation, watchstanding, and use and care of navigational charts, tables, publications, and classified matter . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
QM

0. SUPERVISION - Continued

1.00 Practical Factors - Continued

- .61 Instruct signal personnel in identification of ships and aircraft . . . . E-6
- .80 Instruct personnel in visual communications procedures and naval  
communications doctrine . . . . . E-7
- .81 Instruct personnel in recognition and authentication procedures  
and codes . . . . . E-7
- .82 Organize and supervise activities and training of assigned personnel  
in maintenance and operation of navigation devices and equipment  
and in maintenance of ship control spaces . . . . . E-7

2.00 Examination Factors

None.

★ SENIOR CHIEF QUARTERMASTER (QMCS)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .90 Plan emergency drills for:
  - a. Navigation Department personnel . . . . . E-8
  - b. Operations Department personnel concerned with voice, teletype,  
and visual communications . . . . . E-8
- .91 Provide technical information dealing with the care and operation of  
assigned navigation and signalling equipment, and with the  
calibration of mechanical navigation and signalling equipment . . . . . E-8
- .92 Observe and evaluate visual communications and navigation training  
exercises and drills. Instruct in correct procedures and techniques,  
and recommend for further training . . . . . E-8

2.00 Examination Factors

- .90 Authority and responsibility of an Officer in Charge . . . . . E-8

★ MASTER CHIEF QUARTERMASTER (QMCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Observe and evaluate:
  - a. Navigation Department exercises and drills . . . . . E-9
  - b. Operations Department exercises and drills, such as those dealing  
with voice, teletype, and visual communications . . . . . E-9
- .96 Fulfill the qualifications for OOD/Navigator . . . . . E-9

2.00 Examination Factors

- .95 Organization and functions of all aspects of the Navigation and  
Operations Departments . . . . . E-9
- .96 Voice, teletype, and visual communications procedures and doctrine . . . . E-9
- .97 Principles of organization and administration of shore and  
small floating units . . . . . E-9

SIGNALMAN (SM)

SERVICE RATING (PO3 and PO2)

SCOPE

Signalmen stand watches on signal bridges and send and receive messages by flashing light, semaphore, and flag-hoist; prepare headings and address for outgoing messages; handle, route, and file messages, encode and decode message headings; operate voice radio; maintain visual signal equipment; render passing honors to ships and boats; display ensigns and personal flags during salutes and during personal and national honors; perform duties of lookouts; send and receive visual recognition signals; repair signal flags, pennants, and ensigns; and take bearings, recognize visual navigational aids.

NOTE: Inasmuch as the rating of signalman encompasses paygrades E-4 and E-5 only, advancement beyond E-5 will normally be quartermaster, first class and chief. Accordingly, signalmen, second class, who are recommended for advancement will be required to meet the broad requirements of the quartermaster rating up to and including the particular paygrade for which they are examined.

QUALIFICATIONS FOR ADVANCEMENT

Required for Advancement to SM

A. VISUAL SIGNALS AND MESSAGES

1.00 Practical Factors

- .01 Locate and operate during darkness, light switches for electrical and electronic visual signal equipment controlled from signal bridge and conning station . . . . . E-4
- .02 Identify visual signal flags and pennants used in the Coast Guard . . . E-4
- .03 Make, use, and identify flag, light, and pyrotechnic international distress signals, emergency signals, and storm-warning signals . . . . . E-4
- .04 Construct any "commander" or "collective" call sign, using type and unit indicators . . . . . E-4
- .05 Identify and give meanings of aircraft, surface ship, and submarine emergency signals . . . . . E-4
- .37 Transmit and receive code groups by flashing light, using standard naval signaling procedures: (See Performance Test Instructions)
  - a. 8 groups of 5-character code a minute for 3 minutes; allowable errors - 2 . . . . . E-4
  - b. 9 groups of 5-character code a minute for 3 minutes; allowable errors - 2 . . . . . E-5
- .38 Transmit and receive plain language messages by flashing light, using standard naval signaling procedures: (See Performance Test Instructions)
  - a. 40 characters a minute for 3 minutes (8 WPM); allowable errors - 1 . . . . . E-4
  - b. 50 characters a minute for 3 minutes (10 WPM); allowable errors - 1 . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SM

A. VISUAL SIGNALS AND MESSAGES - Continued

1.00 Practical Factors - Continued

- .39 Transmit and receive plain language messages by semaphore, using standard naval signaling procedures: (See Performance Test Instructions)
  - a. 75 characters a minute for 2 minutes (15 WPM), allowable errors - 2 . . . . . E-4
  - b. 100 characters a minute for 1 minute (20 WPM), allowable errors - 2 . . . . . E-5

2.00 Examination Factors

- .01 Standard signaling procedures: basic transmission rules used in visual communications, procedure for establishing communications, use of operating signals and prosigns, and rules for counting and checking groups . . . . . E-4
- .02 Construction and use of all visual call signs, international call signs, and task organization calls for ships and commands . . . . . E-4
- .03 Distinction between a call and a signal in a flaghoist; order of reading of flaghoist and significance of dipped, closeup, and haul down . . . . . E-4
- .04 Operating procedures used in identification, correction, repetition, acknowledgement, verification, and cancellation of messages and flaghoist signals . . . . . E-4
- .05 Meanings and methods of displaying single flags and pennants, and governing groups and pennants . . . . . E-4
- .06 Rules of visual responsibility in passing and relaying messages and flaghoist signals . . . . . E-4
- .07 Method of directing boat for "man overboard" during day or night . . . . . E-4
- .08 Use of infrared communication equipment, mercury-xenon, incandescent, and xenon-arc signal searchlights . . . . . E-4
- .40 International signaling procedures . . . . . E-5
- .41 Responsibilities of the originator of visual messages . . . . . E-5
- .42 Wartime provisions for use of visual methods of signaling . . . . . E-5
- .43 Uses of boat guard, guide and one-letter indicator flags and pennants, and governing groups and pennants . . . . . E-5

B. NONVISUAL SIGNALS AND MESSAGES

1.00 Practical Factors

- .01 Operate voice radio, using radiotelephone procedures . . . . . E-4

2.00 Examination Factors

- .40 Operational and administrative uses of exterior means of sending voice radio . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SM

C. PREPARATION AND SERVICING OF MESSAGES

1.00 Practical Factors

- .01 Prepare a visual message for transmission, using proper form . . . . . E-4
- .40 Service a message: convert visual or radio headings into plain language according to addresses, precedence, routing, and special instructions . . . . . E-5
- .41 Encode and decode any naval or international signal contained in effective visual communication publications . . . . . E-5
- .42 Use provisions of Reserve On Board signaling and recognition publications to draft a message or recognition signal under simulated wartime conditions . . . . . E-5

2.00 Examination Factors

- .01 Significance of precedence in handling and routing messages . . . . . E-4
- .02 Message structure, including all components . . . . . E-4
- .03 Challenge and reply procedures . . . . . E-4

D. COLORS, HONORS, AND CEREMONIES

1.00 Practical Factors

- .01 Render passing and side honors . . . . . E-4
- .40 Identify flags and ensigns of the principal maritime nations . . . . . E-5
- .41 Identify personal flags of major naval powers . . . . . E-5
- .42 Dress and full-dress a ship . . . . . E-5

2.00 Examination Factors

- .40 Rules governing display of U. S. ensign, U. N. flag, personal flags, and flags of civil officials . . . . . E-5

E. NAVIGATION

1.00 Practical Factors

- .01 Take visual bearings, using azimuth circle, bearing circle and alidade . . . . . E-4
- .02 Take fathometer readings . . . . . E-4
- .03 Identify visual aids to navigation . . . . . E-4
- .40 International and Inland Rules of the Road: recognize characteristics of lights carried, and fog signals used underway and at anchor by power-driven and sailing vessels, and seaplanes; recognize whistle signals for overtaking, crossing, and meeting situations . . . . . E-5

2.00 Examination Factors

- .01 U. S. System of buoyage: types of buoys and significance of their markings and numbering . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SM

F. WATCHSTANDING

1.00 Practical Factors

- .01 Stand watches as signalman on bridge underway and in port . . . . . E-4
- .02 Perform duties of a signalman as member of a boatcrew . . . . . E-4
- .03 Perform duties of lookout and identify types of U. S. and foreign ships and aircraft . . . . . E-4
- .04 Stand watches as quartermaster on the bridge underway and at the gangway in port . . . . . E-4
- .05 Make entries in visual signal log . . . . . E-4
- .40 Locate a particular ship in own task force, using maneuvering board of task force disposition, and be familiar with task force composition of own unit . . . . . E-5

2.00 Examination Factors

None.

G. MAINTENANCE, REPAIR, AND SAFETY

1.00 Practical Factors

- .01 Perform routine upkeep of visual signaling equipment . . . . . E-4
- .02 Reeve and splice halyards . . . . . E-4
- .40 Make and repair signal and personal flags and pennants; repair ensigns and jacks . . . . . E-5

2.00 Examination Factors

- .01 Care of optical equipment, flags, and halyards . . . . . E-4
- .02 Safety precautions to be observed in the use of infrared, mercury-xenon, and pyrotechnic signaling equipment . . . . . E-4

H. ADMINISTRATION

1.00 Practical Factors

- .01 Maintain visual signal log and visual traffic files . . . . . E-4
- .02 Correct and maintain signal publications . . . . . E-4
- .40 Maintain custody cards and inventory files for equipment and consumable goods . . . . . E-5
- .41 Prepare memorandum requests for survey and for requisition of equipment . . . . . E-5
- .42 Instruct signal personnel in identification of ships and aircraft . . . . . E-5

2.00 Examination Factors

- .01 Names, uses, contents, and sources of supply of standard signal publications . . . . . E-4
- .02 Security precautions to be observed in handling and stowing classified matter and recognition signals . . . . . E-4
- .03 Use of the Naval Signal Book and interpretation of its contents . . . . . E-4



★ SONAR TECHNICIAN (ST)

GENERAL RATING

SCOPE

Sonar Technicians are graduates of Class A1, A2 and C School. They obtain and interpret underwater data for operational use; supervise the use and upkeep of sonar and underwater fire control equipment; organize antisubmarine (A/S) attack teams; train and supervise personnel in their assignments; operate (manipulate, control, evaluate, and interpret data) sonar, underwater fire control equipment, and associated equipment for the solution of antisubmarine warfare problems; evaluate targets and interpret oceanographic data; determine sonar performance data; evaluate equipment operation; locate and analyze equipment casualties; perform operational (repairs, adjustments, alignments) and preventive maintenance on all ASW systems (less ASW weapons) including test equipments; and train personnel in all categories of equipment maintenance. Requires a thorough working knowledge of solid state micro-miniature technology.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ST

A. SAFETY PRECAUTIONS

1.00 Practical Factors

- .01 Demonstrate and observe safety precautions in operation and maintenance of sonar and associated equipment ..... E-4
- .02 Demonstrate under simulated conditions the rescue of a person in contact with an energized circuit, resuscitation of a person unconscious from electrical shock and treatment for electrical burns ..... E-4

2.00 Examination Factors

- .01 Symptoms and effect of electrical shock ..... E-4
- .02 Electrical and electronic safety precautions, including those set forth in Chapter 18, U. S. Navy Safety Precautions, OPNAV 34Pl; Chapter 67, BuShips Technical Manual; and CG-165, to be observed in servicing sonar and associated equipment ..... E-4

B. SONAR EQUIPMENT

1.00 Practical Factors

- .01 Start, stop, adjust, and operate sonar detection equipment under varying acoustical conditions including periods of submarine jamming, and own ship's acoustic countermeasures ..... E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ST

B. SONAR EQUIPMENT - Continued

1.00 Practical Factors - Continued

- .02 Antisubmarine procedures:
  - a. Demonstrate standard operating procedures during sonar search, contact, attack, lost contact, regained contact and reattack situations ..... E-4
  - b. Identify sounds produced by surface ships, torpedoes, mines, snorkeling submarines, evasion devices, marine life and other natural phenomena ..... E-4
  - c. Description, recognition and classification of sonar contacts, including evaluation of echo quality, doppler, sonarscope presentation, classification recorder traces, wakes, hydrophone effects and determination of contact movement ..... E-4
  - d. Determine target aspect, doppler, true and relative bearings, range and range rate, true and relative motion, and target course, during A/S situations ..... E-4
- .03 Emergency operating procedures for equipment casualties ..... E-4
- .04 Start, stop, adjust, and operate associated equipment
  - a. Classification recorder ..... E-4
  - b. Fathometer ..... E-4
  - c. Underwater Telephone ..... E-4
  - d. Sonar test equipment ..... E-4
  - e. Sonar alignment buoy ..... E-4
  - f. Sonar target simulator ..... E-4
- .60 Methods of sonar range prediction ..... E-6
- .61 Act as sonar supervisor during cruising and attack situations ..... E-6
- .80 Train battle station and watchstanding operators on sonar, and associated equipment ..... E-7

2.00 Examination Factors

- .01 Nomenclature, function, capabilities of sonar equipment ..... E-4
- .02 Physics of sound, including refraction, attenuation, and doppler effect as applied to sonar detection equipment. Variations in physical properties of water and effect of boundaries (surface, thermal, and bottom) on underwater sound. Application of water phenomena to sonar operation ..... E-4
- .03 Characteristics and functions of submarine controlled jamming and evasive devices, such as stationary false targets, mobile decoys, and noisemakers ..... E-4

C. UNDERWATER FIRE CONTROL EQUIPMENT

1.00 Practical Factors

- .01 Start, stop, adjust, and operate underwater fire control equipment ..... E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ST

C. UNDERWATER FIRE CONTROL EQUIPMENT - Continued

- 1.00 Practical Factors - Continued
  - .02 Read dials and set operating controls to predetermined values on underwater fire control equipment ..... E-4
  - .03 Determine information such as attack course, torpedo lead angle, and weapon launching range during ASW situations ..... E-4
  - .40 Demonstrate on underwater fire control equipment operating procedures and techniques required to:
    - a. Perform transmission checks ..... E-5
    - b. Perform computing and rate tests, and evaluate and record results ..... E-5
  - .41 Calibrate underwater fire control equipment on duty station .. E-5
  - .60 Conduct all electrical tests on an underwater fire control system ..... E-6
  - .80 Train battle station and watchstanding operators on underwater fire control equipment ..... E-7
- 2.00 Examination Factors
  - .01 Nomenclature, function and capabilities of underwater fire control equipment ..... E-4
  - .40 Functional descriptions of underwater fire control system components and associated firing panels ..... E-5
  - .41 Elements of underwater fire control problems ..... E-5
  - .42 Purpose, principles, and adjustments of basic underwater fire control mechanisms ..... E-5
  - .43 Purpose and technique of aligning sonar equipment and how it affects underwater fire control solution accuracy ..... E-5

D. ANTISUBMARINE OPERATIONS

- 1.00 Practical Factors
  - .01 Start, stop, adjust, and operate associated ASW equipment:
    - a. Torpedo countermeasures control panel ..... E-4
    - b. Data recording equipment (tape recorders, etc.) ..... E-4
    - c. ASW Plotting System ..... E-4
  - .02 Make a tape recording of a contact suitable for analysis or training ..... E-4
  - .40 Interpret sonar conditions to determine effective sonar range ..... E-5
  - .60 Set up A/S screens and searches ..... E-6
  - .61 Construct torpedo danger zone with limiting lines of approach ..... E-6
  - .62 Construct submarine probability area ..... E-6
  - .80 Direct sonar activity in any A/S exercise or attack, including coordinated operations, holddown, lost contact and launching of A/S weapons ..... E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ST

D. ANTISUBMARINE OPERATIONS - Continued

1.00 Practical Factors - Continued

- .81 Act as A/S officer during single ship and multiship attack situations ..... E-7
- .82 Demonstrate familiarization with current fleet A/S doctrine and corresponding reference publications ..... E-7

2.00 Examination Factors

- .01 ASW terms and definitions ..... E-4
- .02 Duties of:
  - a. Sonar personnel assigned to sonar control, sonar equipment room, underwater battery (UB) plot, CIC, and bridge during cruising and general quarters ..... E-4
  - b. Personnel assigned to ASW weapon stations ..... E-4
- .03 Shipboard A/S search and attack organization, including functional relationship of bridge, sonar control, UB plot, CIC, and weapon station personnel ..... E-4
- .04 General submarine characteristics to include capabilities and limitations ..... E-4
- .40 Capabilities of ASW weapons ..... E-5
- .60 Concepts of coordinated ASW operations ..... E-6
- .80 Procedures for directing attack of surface ship during coordinated A/S attack ..... E-7

E. COMMUNICATIONS

1.00 Practical Factors

- .01 Send and receive International Morse Code (plain language and sonar-short-signals) at a rate of six words per minute on standard sonar equipment ..... E-4
- .02 Furnish each station of the ASW organization with sonar reports (using standard procedures, phraseology and proper sequence) for conducting A/S operations ..... E-4
- .03 Operate underwater telephone, using standard radio telephone procedures and phraseology ..... E-4
- .04 Operate sound powered telephones, using standard sound powered telephone procedures and phraseology ..... E-4
- .05 Operate radio telephones in CIC using proper procedures and phraseology ..... E-4
- .40 Send and receive International Morse Code (plain language) at a rate of ten words per minute on sonar equipment ..... E-5

2.00 Examination Factors

- .01 Communication facilities associated with A/S operations including MC circuits, voice tubes, remote indicators, repeaters and sound powered phones; sonar short signals and underwater telephone procedures ..... E-4

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
ST

**E. COMMUNICATIONS - Continued**

**2.00 Examination Factors - Continued**

- .02 Standard vocabulary, procedures and techniques used in transmitting and receiving messages on CIC radio telephones ..... E-4

**F. CIC OPERATIONS**

**1.00 Practical Factors**

- .01 Start, stop, adjust, and operate ASW plotting system (NC-2)..... E-4
- .02 Demonstrate ability to perform CIC duties as part of A/S operations by maintaining ASW action plot during search, detection, attack, and re-attack phases ..... E-4
- .03 Maintain ASW status boards found in CIC ..... E-4
- .04 Furnish information regarding location, identity, and movements of contacts, determined by interpreting information gained from ASW plotting system (NC-2) ..... E-4
- .05 Maintain ASW Flow Chart ..... E-4

**2.00 Examination Factors**

- .01 Functions of CIC ..... E-4
- .02 ASW plotting symbols ..... E-4
- .40 Utilization of ASW tactical and action plots ..... E-5
- .41 CIC role in ASW operations ..... E-5
- .42 CIC ASW personnel organization ..... E-5
- .43 Application of ECM data in A/S operations ..... E-5

**G. BATHYTHERMOGRAPH**

**1.00 Practical Factors**

- .01 Take and interpret bathythermograph reading following the prescribed procedure ..... E-4
- .02 Operate and maintain:
  - a. Bathythermograph ..... E-4
  - b. Bathythermograph winch ..... E-4
- .03 Check calibration of bathythermograph ..... E-4
- .40 Prepare and interpret sonar messages in accordance with current doctrine ..... E-5

**2.00 Examination Factors**

- .40 Application of bathythermograph information to A/S operations .. E-5

**H. ELECTRICITY AND ELECTRONICS**

**1.00 Practical Factors**

- .40 Recognize electronic equipment stages and demonstrate ability to

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ST

H. ELECTRICITY AND ELECTRONICS - Continued

1.00 Practical Factors - Continued

- read and interpret block diagrams, wiring diagrams and schematics, and trace signal flow ..... E-5
- .60 Repair transistorized circuits on printed circuit boards ..... E-6

2.00 Examination Factors

- .01 Meanings of electrical, electronic and mechanical symbols used in sonar underwater fire control and associated equipment schematics ..... E-4
- .02 Construction of motors and generators; application of laws of magnetism to electrical rotating machinery ..... E-4
- .03 Methods of calculating current, voltage, and resistance in DC series and parallel circuits ..... E-4
- .04 Methods of calculating current, voltage, phase angle, impedance, and resistance in series and parallel AC circuits ... E-4
- .05 Functions and characteristics of elements used in cathode-ray tubes and gas tubes ..... E-4
- .06 Functions of semiconductor devices, such as diodes, NPN-PNP transistors, field-effect transistors, and thyristors ..... E-4
- .40 Principles and function of transistor and other solid state circuits, such as:
  - a. Power supplies, filter circuits, and regulators ..... E-5
  - b. Amplifiers ..... E-5
  - c. Oscillators ..... E-5
  - d. Detectors ..... E-5
  - e. Resonance (series and parallel) ..... E-5
  - f. Coupling ..... E-5
  - g. Impedance matching and power transfer ..... E-5
  - h. Cathode and emitter followers ..... E-5
  - i. Modulators ..... E-5
  - j. Multivibrators (including flip-flop), and saw-tooth generators ..... E-5
  - k. Automatic Gain and Frequencies Control ..... E-5
  - l. Phase shifters and inverters ..... E-5
  - m. Coincidence ..... E-5
  - n. Limiters and clampers ..... E-5
  - o. Delay lines ..... E-5
  - p. Multiplexing and de-multiplexing ..... E-5
- .41 Mathematics for electronics including Boolean algebra and logarithmic functions ..... E-5
- .60 Function and construction of subminiature and printed circuits ..... E-6
- .61 Function of digital circuitry devices, such as converters, counters, comparators, shift registers, encoders, decoders, over-driven amplifiers, and read-out indicators ..... E-6
- .80 Sound propagation and the construction of transducers ..... E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ST

I. MAINTENANCE

1.00 Practical Factors

- .01 Use currently proscribed maintenance procedures for performing operational and preventive maintenance checks on sonar, underwater fire control, and associated equipment ..... E-4
- .02 Inspect, clean and lubricate sonar, underwater fire control and associated equipment in accordance with technical maintenance publications ..... E-4
- .04 Select and use handtools and small portable power tools provided for maintenance and repair of sonar and all associated equipment ..... E-4
- .07 Inspect and clean commutators and slip ring assemblies; inspect and replace brushes ..... E-4
- .09 Test and repair or replace parts such as relays, plugs, lamps, fuses, switches, tubes, jacks, cables, wiring, fixed capacitors, variacs, variable capacitors, transformers, filters, resistors, inductors, while under supervision of a senior ST ... E-4
- .10 Identify electrical characteristics of circuit components by EIA color coding and other circuit marking systems ..... E-4
- .11 Test electronic circuits for continuity, short circuits, and grounds; measure electrical quantities, such as voltage, current and frequency and compare with established values; use an oscilloscope to view circuit waveforms and compare with established optimum performance waveforms required in sonar, underwater fire control and associated equipment ..... E-4
- .39 Operate the following test equipment:
  - a. Electronic and nonelectronic volt-ohm-ammeter ..... E-4
  - b. Tube tester ..... E-4
  - c. Oscilloscope (Dual Trace, Storage Types) ..... E-4
  - d. Megohmmeter ..... E-4
  - e. Frequency counter ..... E-5
  - f. Signal generator ..... E-5
  - g. Synchro tester ..... E-5
  - h. Transistor tester ..... E-5
  - i. AN/WQM-4 ..... E-5
  - j. X/Y and polar recorders ..... E-5
  - k. Z angle meters ..... E-5
- .43 Identify by marking systems interconnecting cables used in sonar and associated equipment ..... E-5
- .44 Localize equipment casualties to units of a set or system of sonar and associated equipment ..... E-5
- .45 Perform tests and adjustments necessary for operation of servo and computing circuits. Test synchro circuits, servo-mechanisms, and interconnecting circuits, and set synchros to electrical zero ..... E-5
- .46 Effect authorized field changes to sonar and associated equipment in accordance with instructions and diagrams ..... E-5
- .47 Perform sensitivity, source level and noise level measurements to determine operational performance of sonar equipment ..... E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ST

I. MAINTENANCE - Continued

1.00 Practical Factors - Continued

- .59 Participate in maintenance schedules:
  - a. Assist in the preparation of a weekly schedule of preventive maintenance ..... E-5
  - b. Prepare a weekly schedule of preventive maintenance ..... E-6
  - c. Assist in the preparation of a quarterly schedule of preventive maintenance ..... E-6
  - d. Prepare quarterly, semiannual, and annual schedules of preventive maintenance ..... E-7
- .60 Localize equipment casualties to parts of subassemblies of sonar, underwater fire control and associated equipment. Repair by replacement of parts or subassemblies. Perform tests, adjustments, calibrations and repairs necessary for proper operation of sonar, underwater fire control and associated equipment . E-6
- .61 Analyze and evaluate electrical and electronic tests; make adjustments, calibrations and repairs necessary for continued operation of sonar, underwater fire control and associated equipment ..... E-6
- .62 Test hydrophones and transducers and test procedures for ..... E-6
- .80 Test and evaluate for proper installation and optimum performance new or overhauled components, assemblies, or subassemblies of sonar, underwater fire control and associated equipment ..... E-7

2.00 Examination Factors

- .01 Handling and testing of solid state components ..... E-4
- .02 Procedures for carrying out sonar, underwater fire control and associated equipment preventive maintenance programs ..... E-4
- .03 Procedures for testing components such as resistors, capacitors, switches, relays, transistors, etc. .... E-4
- .04 Procedures for using test equipment needed for testing and maintaining sonar equipment ..... E-4
- .40 Procedures for isolating portions of electronic circuits to a single stage ..... E-5
- .41 Procedures for taking a sonar beam pattern, source level, noise figure, receiver sensitivity and performance figure ..... E-5
- .60 Methods of testing and replacing transducers; utilization of hydrophones for trouble shooting ..... E-6
- .61 Principles of servo-loops and computing circuits ..... E-6
- .80 Procedures for testing and evaluating sonar equipment performance after installation or complete overhaul (certification) ..... E-7
- .81 Relationships of electrical and mechanical inputs and outputs of shipboard ASW weapon launchers ..... E-7



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ST

J. ADMINISTRATION

1.00 Practical Factors

- .01 Maintain and use applicable technical publications ..... E-4
- .02 Obtain parts and stock numbers from technical and supply publications ..... E-4
- .03 Record operational data on recorder traces and maintain sonar equipment operation and communication logs ..... E-4
- .04 Maintain sonar, underwater fire control, ASW plotting systems and associated equipment maintenance logs ..... E-4
- .05 Take, record and report inventories of tools and portable test equipment available for maintenance and repair of sonar and associated equipment ..... E-4
- .61 Train, drill and supervise A/S teams on synthetic training devices and at cruising watch or general quarter stations ..... E-6
- .62 Supervise maintenance and repair of sonar, underwater fire control, ASW plotting systems and associated equipment ..... E-6
- .63 Prepare and complete periodic or recurring reports concerning performance and maintenance of sonar, underwater fire control, ASW plotting systems and associated equipment ..... E-6
- .64 Prepare work requests ..... E-6
- .80 Organize, supervise, and train personnel in the operation, maintenance and repair of sonar, underwater fire control, ASW plotting systems and associated equipment ..... E-7
- .81 Evaluate completed failure reports, operational and maintenance logs, requisitions for tools, and replacement parts, inventories of tools and portable test equipment, job orders, work requests, and reports concerning performance and maintenance of sonar, underwater fire control, ASW plotting systems and associated equipment ..... E-7
- .82 Plan and implement a comprehensive preventive and corrective maintenance program for sonar equipment, underwater fire control, ASW plotting systems and associated equipment ..... E-7
- .83 Plan and implement a training program in electronic theory oriented to modern technology ..... E-7

2.00 Examination Factors

- .01 Regulations for stowage, correction and destruction of classified material ..... E-4
- .40 Types of information found in the following publications: Ordnance Pamphlets, Ordnance Data, Ordnance Circular Letters, Ordnance Material Letters, Ordnance Alterations, and applicable instructions and notices ..... E-5
- .60 Types and utilization of COMTAC publications pertaining to ASW ..... E-6

SENIOR CHIEF SONAR TECHNICIAN (STCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ST

1.00 Practical Factors

- .90 Plan and implement a comprehensive preventive and corrective maintenance program for sonar equipment, underwater fire control systems, and other related systems ..... E-8
- .91 Plan and implement a training program in advanced electronics ..... E-8
- .92 Evaluate visual and aural sonar contact information from active and passive sonar and bearing, range, and tape recorders and make classification and tactical recommendations pertaining to the information ..... E-8

2.00 Examination Factors

- .90 Operational capability of advanced sonar and underwater fire control equipment, including fundamental knowledge of their electronic circuits and mechanisms ..... E-8
- .91 Advanced theory of electricity and electronics with emphasis on solid state electronics ..... E-8

MASTER CHIEF SONAR TECHNICIAN (STCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Provide information and advice to sonar and ASW Staff personnel to assist in solving operational and technical problems regarding sonar, underwater fire control and associated equipment ..... E-9
- .96 Provide command with technical information and advice concerning operational employment, capabilities, and limitations of sonar and underwater fire control equipment ..... E-9

2.00 Examination Factors

- .95 Operational and technical information necessary for a complete understanding of sonar, underwater fire control and associated equipment, and current ASW doctrine ..... E-9
- .96 Principles of journalism relating to the writing of Servicewide examinations and correspondence courses ..... E-9
- .97 Principles of personnel administration relating to assigning sonar personnel and the determination of their career patterns ..... E-9

SPECIAL PHYSICAL REQUIREMENTS INFORMATION FOR ST RATING

- 1. Normal color perception.
- 2. Minimum auditory requirements:
  - a. Auditory acuity represented by not more than 20 decibels hearing loss in either ear as measured by standard audiometer at 512, 1024, and 2048 cycles per second.

RADARMAN (RD)

GENERAL RATING

SCOPE

Radarmen perform basic and control functions of CIC as plotters, operators, status-board keepers, and talkers; maintain CIC displays; advise on capabilities, limitations, and condition of assigned equipment; apply a thorough knowledge of CIC doctrine and procedures contained in NWP and NWIP publications, tactical doctrine, and procedures contained in ATP, NWP, and NWIP publications, operational communications doctrine and procedures contained in ATP, ACP, JANAP, DNC, NWP, and NWIP publications, and hydrographic procedures necessary for radar navigation contained in Hydrographic Office (now Naval Oceanographic Office) publications; and operate, perform operational and preventive maintenance on surveillance radar , IFF, and associated equipment.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for Advancement to RD

A. DETECTION EQUIPMENT

1.00 Practical Factors

- .01 Start, stop, operate, and tune (at operating positions, when possible) surveillance radar equipment, including associated IFF (Identification Friend or Foe)/ECM (Electronic Counter-measure) equipment . . . . . E-4
- .02 Start, stop, operate, and adjust remote plan position indicators (RPPI) . . . . . E-4
- .03 Start, stop, operate, and adjust fathometer equipment . . . . . E-4
- .40 Start, stop, and operate Sonar Stack, Tactical Range Recorder (TRR) and Attack Plotter (AP) . . . . . E-5
- .60 Tune radar in accordance with the step-by-step procedure listed in the technical publications for that radar . . . . . E-6
- .61 Start, stop, and operate Radio Direction Finder equipment (RDF) . . . . . E-6

2.00 Examination Factors

- .39 Nomenclature and principles of operation of:
  - a. Surveillance radar, IFF, ECM, and associated equipment, including Remote Plan Position Indicator (RPPI) . . . . . E-4
  - b. Sonar and associated equipment . . . . . E-5
  - c. Radio Direction Finder equipment (RDF) . . . . . E-6

B. INTERPRETATION

1.00 Practical Factors

- .01 Distinguish between radar contacts caused by ships, aircraft, and missiles and those caused by natural disturbances. . . . . E-4
- .02 Determine the following contact information from appropriate radar equipment: range, bearing, composition (estimate) and identification (IFF) . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RD

B. INTERPRETATION - Continued

2.00 Examination Factors

- .01 Electronic characteristics and operational features of surveillance radar, IFF, and associated equipment . . . . . E-4
- .02 Evaluation of radarscope presentations caused by different types of contacts . . . . . E-4

C. COMBAT INFORMATION CENTER (CIC) OPERATIONS

1.00 Practical Factors

- .01 Solve maneuvering board problems for course and speed, closest point of approach on contact and maneuvering to new position . . . . . E-4
- .02 Adjust parallel motion protractor equipment, position bug, and make appropriate scale and quadrant and latitude and longitude setting on dead-reckoning tracer (DRT) or plotting table . . . . . E-4
- .03 Locate information in tactical publications and operation (OP) orders . . . . . E-4
- .04 Maintain at least three tracks on geographic, summary, and surface plots . . . . . E-4
- .05 Convert given positions into grid coordinates; convert polar to grid coordinates and grid to polar coordinates . . . . . E-4
- .06 Transmit, receive, and authenticate on radiotelephone circuits, using standard procedures and techniques as defined in communications doctrinal publications; encode and decode signals from Allied Naval Signal Book . . . . . E-4
- .07 Maintain all types of status boards . . . . . E-4
- .08 Plot ranges, bearings, and fixes on nautical charts including dead reckoning and solving set and drift . . . . . E-4
- .09 Set up formations and screens on surface plot by direct reference to current tactical publications . . . . . E-4
- .10 Demonstrate use of the dead reckoning tracer (DRT) in "man overboard" procedures . . . . . E-4
- .11 Send and receive simple messages in Morse Code by flashing light . . . . . E-4
- .12 Serve as S/P telephone talker in CIC using standard procedures . . . . . E-4
- .13 Track upper air observation balloons; assist in the plotting, recording, and pre-release observation checks . . . . . E-4
- .14 Take bathythermograph (BT) observations and make standard entries on Oceanographic Log Sheet . . . . . E-4
- .40 Perform functions by furnishing information regarding location, identity and movement of contacts, determined by interpreting information gained from radar equipment and data derived from plots maintained . . . . . E-5
- .41 Perform duties related to navigation and piloting by plotting own ship's track by radar fix and maintaining geographic plot, applying principles of advance, transfer, acceleration, and deceleration. . . . . E-5
- .42 Perform duties during antisubmarine (A/S) operations by maintaining strategic geographic and surface plots during search, detection, attack, and retirement phases . . . . . E-5
- .60 Perform duties related to tactical communications by organizing assigned communications equipment, facilities, and personnel to implement communications plans . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RD

C. COMBAT INFORMATION CENTER (CIC) OPERATIONS - Continued

1.00 Practical Factors - Continued

- .61 Take measures to restore operations under battle and emergency conditions, including fire, personnel injuries, and loss of or damage to radars, interior communications, lighting, DRT, plots, and status boards. . . . . E-6
- .62 Perform duties related to antiaircraft (AA) coordination, including target indication, designation, and acquisition . . . . . E-6
- .63 Perform the functions of air control in situations requiring the control of aircraft which do not involve ground-controlled-approach (GCA), carrier-controlled-approach (CCA), and air-to-air intercept . . . . . E-6
- .64 Set up CIC controlled radio equipment in accordance with communication plan . . . . . E-6
- .80 Perform functions of air control in all situations involving control of aircraft, excluding GCA and CCA. Accomplishment of this factor does not establish qualifications as Air Intercept Controllers (AIC) . . . . . E-7
- .81 Perform duties of Enlisted Supervisor and act as an assistant to the evaluator during Condition I and Condition I ASW . . . . . E-7

2.00 Examination Factors

- .01 Information to be gained from nautical charts, including symbols, topography, depth, and variation . . . . . E-4
- .02 Radar search procedures . . . . . E-4
- .03 Definitions of terms used in surface formation, screening, and general maneuvering . . . . . E-4
- .04 Interior communication procedure and facilities . . . . . E-4
- .05 Symbols and procedures used in maintaining geographic, summary, and surface plots . . . . . E-4
- .06 Procedures for plotting on nautical charts, including ranges, bearings, radar fixes, determination of courses, distances, and set and drift . . . . . E-4
- .07 Procedures for converting given positions into grid coordinates; conversion of polar to grid coordinates and grid to polar coordinates . . . . . E-4
- .08 Standard vocabularies, procedures, and techniques used in transmitting and receiving on CIC radiotelephone circuits, as defined in communication doctrinal publications . . . . . E-4
- .09 General contents and use of ATP, NWP, NWIP, ACP, JANAP, DNC, and FXP publications . . . . . E-4
- .10 Procedures for Aircraft Ditch and Rescue by Ocean Station Vessel . . . . . E-4
- .11 Organization and operation of Search and Rescue, including communications, search patterns, search areas, and coverage . . . . . E-4
- .12 Basic rules of the road . . . . . E-4
- .13 Procedures for solving the following types of maneuvering board problems: determination of course and speed of contact, closest point of approach of contact, and maneuvering to a new position . . . . . E-4
- .40 Capabilities and limitations of communication equipment and facilities . . . . . E-5
- .41 Electronic warfare procedures . . . . . E-5
- .42 Information supplied by CIC in normal cruising conditions and special exercises . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RD

C. COMBAT INFORMATION CENTER (CIC) OPERATIONS - Continued

2.00 Examination Factors - Continued

- .43 Procedures for solving advanced maneuvering board problems . . . . . E-5
- .44 Current Standard Operating Principles for Ocean Station Vessels . . . . . E-5
- .60 Procedures in assisting A/S operations, including internal and external communication requirements . . . . . E-6
- .61 Functions and procedures in tactical deception, and assisting in naval gunfire support . . . . . E-6
- .62 Functions of air control in situations requiring control of aircraft which do not involve air-to-air intercepts . . . . . E-6
- .63 Doctrine and procedures contained in applicable ATP, NWP, NWIP, ACP, JANAP, DNC, AND FXP publications . . . . . E-6
- .64 Basic ASW tactics and weapons employment . . . . . E-6
- .80 Procedures in control of small craft, including those involved in amphibious operations . . . . . E-7
- .81 Functions of air control in all situations involving the control of aircraft . . . . . E-7

D. SAFETY PRECAUTIONS AND FIRST AID

1.00 Practical Factors

- .01 Observe safety precautions in connection with operating and maintaining electronic equipment . . . . . E-4
- .02 Demonstrate under simulated conditions the rescue of a person in contact with an energized electrical circuit, resuscitation of a person unconscious from electrical shock and treatment for burns . . . . . E-4

2.00 Examination Factors

None.

E. IDENTIFICATION OF ELECTRONIC COMPONENTS

1.00 Practical Factors

- .01 Locate and identify units and component parts of radar and IFF equipment . . . . . E-4
- .02 Name the major circuits affected by the operation of the external controls on radar and associated equipment . . . . . E-4
- .03 Read color codes and circuit markings to identify electrical characteristics of circuit components and connections . . . . . E-4
- .40 Identify circuit components such as electron tubes, resistors, and capacitors . . . . . E-5
- .60 Identify in schematic diagrams basic circuits such as amplifiers, oscillators, mixers, and rectifiers . . . . . E-6
- .61 Interpret circuit diagrams found in technical manuals . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RD

E. IDENTIFICATION OF ELECTRONIC COMPONENTS - Continued

2.00 Examination Factors

- .39 Define common electrical and electronic terms used with radar equipment:
  - a. Volt, ohm, ampere, and watt . . . . . E-4
  - b. Henry, farad, reactance, impedance, capacitance, inductance, frequency, and modulation . . . . . E-5
- .40 Color codes and circuit markings used to identify and describe electrical characteristics of circuit components and connections . . . . E-5

F. ELECTRICITY AND ELECTRONICS

1.00 Practical Factors

None.

2.00 Examination Factors

- .01 Standard symbols used in schematic diagrams . . . . . E-4
- .02 Reading and interpretation of block diagrams . . . . . E-4
- .40 Functions and interrelationships of the following: modulator, transmitter, receiver, antenna, control unit, and indicator units. . . . E-5
- .41 General content of technical manuals . . . . . E-5
- .42 General effect of circuit components such as resistors, capacitors, and inductors on flow of a.c. and d.c. . . . . E-5
- .43 Procedures and purposes of routine tests on electronic equipment . . . . E-5
- .44 Functions, physical structure, and operating principles of electron tubes . . . . . E-5
- .60 Reading and interpreting circuit schematic diagrams . . . . . E-6
- .61 Characteristics of a.c. and d.c. . . . . E-6
- .62 Functions of basic circuits such as rectifiers, amplifiers, oscillators, detectors, and band-pass filters . . . . . E-6

G. OPERATIONAL AND PREVENTIVE MAINTENANCE

1.00 Practical Factors

- .01 Inspect indicator lamps and fuses and replace as necessary . . . . . E-4
- .02 Measure radar ringtime . . . . . E-4
- .40 Perform routine operational maintenance and tests on electronic equipment . . . . . E-5
- .80 Locate electrical and electronic circuit failures, employing systematized procedures for isolating inoperative sections of radar equipment as specified in technical manuals . . . . . E-7

2.00 Examination Factors

- .01 Common failure causes in motors and generators; solvents and lubricants used . . . . . E-4
- .40 Purposes and uses of test equipment in performing operational and preventive maintenance . . . . . E-5
- .80 Systematized procedures for locating electrical and electronic circuit failures as specified in technical manuals . . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RD

H. CLERICAL

1.00 Practical Factors

- .01 Prepare and maintain logs for CIC operations, radio circuits, contacts, and operating equipment . . . . . E-4
- .02 Prepare requisitions for CIC supplies . . . . . E-4
- .03 Maintain publications and nautical charts issued to CIC . . . . . E-4
- .04 Prepare Flight Data Card (CG-3424) . . . . . E-4
- .60 Prepare requests for survey and requisition of equipment, parts, and supplies . . . . . E-6
- .80 Compute CIC statistics necessary for submission of Report of Operational Data (Form CG-2965) . . . . . E-7

2.00 Examination Factors

- .01 Purpose of and entries made in CIC operations, radio circuit, contact equipment, and equipment operating logs . . . . . E-4
- .02 Procedures for requisitioning CIC supplies . . . . . E-4
- .60 Types and purposes of entries made in equipment histories . . . . . E-6
- .61 Preparation of requests for survey and requisition of equipment, parts, and supplies . . . . . E-6

I. ADMINISTRATION

1.00 Practical Factors

- .40 Supervise and train individual CIC personnel in plotting, status board keeping, and radio/telephone procedures . . . . . E-5
- .41 Stand inport gangway watch . . . . . E-5
- .60 Supervise and train personnel in operating interrelationships as a CIC team . . . . . E-6
- .61 Instruct personnel in principles of radar operations . . . . . E-6
- .80 Serve as assistant to CIC officer in general administration of CIC enlisted personnel . . . . . E-7
- .81 Plan, organize, schedule, and supervise training programs . . . . . E-7
- .82 Plan facilities and organize personnel for CIC operations for conditions of readiness . . . . . E-7
- .83 Plan, organize, and schedule operational and preventive maintenance programs for electronic equipment assigned to CIC . . . . . E-7

2.00 Examination Factors

- .01 Procedures to be observed in handling and stowing classified material . . . . . E-4
- .40 Source of data for ship's log; proper phraseology for Quarter-master's Notebook. . . . . E-5



★ SENIOR CHIEF RADARMAN (RDCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RD

1.00 Practical Factors

- .90 Provide to the command technical information and advice concerning capabilities, limitations, reliability, and operation of CIC equipment . . . . . E-8
- .91 Perform casualty analysis on complex radar and associated equipment . . . . . E-8
- .92 Collect, prepare, and disseminate technical information pertaining to test, maintenance, and repair of radar and associated equipment . . . . . E-8
- .93 Understand the concept of Electronics Warfare including passive intercept, early warning, and utilization of radar under conditions of radar jamming and interference . . . . . E-8

2.00 Examination Factors

- .90 Nature and scope of information in current naval publications concerning CIC functions and procedures . . . . . E-8
- .91 Functions and organization of operations department . . . . . E-8

★ MASTER CHIEF RADARMAN (RDCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Develop procedures and supervise practices and techniques for casualty analysis of radar and associated equipment . . . . . E-9
- .96 Coordinate repair and maintenance programs with operational employment equipment . . . . . E-9

2.00 Examination Factors

- .95 Operating principles of stable elements associated with radar . . . . . E-9
- .96 Regulations and procedure in the operations department destruction bill for classified material and equipment . . . . . E-9



FT



GM



TM

# ORDNANCE GROUP II

Fire Control Technician	FT
Gunner's Mate	GM
Torpedoman's Mate	TM

FIRE CONTROL TECHNICIAN (FT)

General Rating

SCOPE

Fire Control Technicians maintain and repair weapon control systems; make detailed mechanical, electronic casualty analysis; and operate, test, lubricate, inspect, clean, adjust, aline and calibrate weapon control system components, radars and sound powered telephone systems.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for Advancement to FT

A. SAFETY PRECAUTIONS

1.00 Practical Factors

- .01 Demonstrate under simulated conditions:
  - a. Rescue of a person in contact with an energized (low voltage, high voltage) circuit where switches are accessible and inaccessible. . . . . E-4
  - b. Resuscitation of a person unconscious from electrical shock and treatment of electrical and acid burns . . . . . E-4
- .02 Demonstrate while servicing equipment:
  - a. Safety precautions such as tagging switches, removing fuses, grounding test equipment, using shorting bars, rubber mats and rubber gloves. . . . . E-4
  - b. Precautions while taking voltage measurements. . . . . E-4

2.00 Examination Factors

- .01 Effects of electrical shock on the human body and first aid associated with resuscitation, such as moving victim and administering stimulants . . . . . E-4
- .02 Regulations regarding the following: working on energized equipment, working alone, working aloft, interlocks and intentionally taking an electrical shock . . . . . E-4
- .03 General safety and servicing precautions as prescribed by OPNAV 34P1 and specific precautions applicable to the equipment to which assigned . . . . . E-4

B. ELECTRICITY AND ELECTRONICS

1.00 Practical Factors

- .01 Calculate current, voltage, resistance, capacitive and inductive reactance in series, parallel and series-parallel a.c. and d.c. circuits containing not more than five components. . . . . E-4
- .39 Operate and perform required tests on the following equipment:
  - a. Multimeter (electronic and non-electronic) . . . . . E-4
  - b. Oscilloscope . . . . . E-4
  - c. Tube, transistor and crystal testers . . . . . E-4
  - d. Megohmmeter (megger) . . . . . E-4
  - e. Signal generator (audio and RF). . . . . E-4
  - f. Low frequency function generator . . . . . E-6
  - g. Synchroscope . . . . . E-6
  - h. Multichannel pen-type electrical recorder. . . . . E-6
  - i. Spectrum analyzer. . . . . E-6
  - j. Range calibrator . . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
FT

B. ELECTRICITY AND ELECTRONICS - Continued

2.00 Examination Factors

- .01 Military standards used in coding resistors, capacitors, transistors, crystal diodes, and other electrical and electronic circuit components . . . . . E-4
- .02 Basic electrical laws pertaining to voltage and current . . . . . E-4
- .03 Operating principles and characteristics of vacuum tubes, semi-conductors, and gas tubes . . . . . E-4
- .39 Basic principles of:
  - a. Alternating current (a.c.) motors and generators . . . . . E-4
  - b. Synchros and resolvers . . . . . E-4
  - c. Power supplies, filters, and power supply regulation using voltage regulator (VR) tubes . . . . . E-5
  - d. Radio frequency (RF), audio and power amplifier (including push-pull circuits) . . . . . E-5
  - e. Detecting, mixing, frequency conversion and coupling circuits as associated with a fundamental receiver . . . . . E-5
  - f. Synchro and servo loops . . . . . E-5
- .40 Operating principles of magnetic amplifiers (half-wave and full-wave) . . . . . E-5

C. OPERATIONS

1.00 Practical Factors

- .01 Read dials and set operating controls to predetermined values on weapon control equipment . . . . . E-4
- .02 Perform operator's adjustments and static, transmission, computing, and rate tests to weapon control equipment assigned . . . . . E-4
- .80 Compute ballistics corrections and arbitrary corrections to hit (ACTH) using standard forms and worksheets . . . . . E-7
- .81 Demonstrate operating procedures and techniques on weapon control equipment as required to train battle station and watchstanding operators . . . . . E-7
- .82 Act as battery control officer . . . . . E-7

2.00 Examination Factors

- .01 Identify standard electrical, electronic, and mechanical symbols used in weapons control equipment diagrams . . . . . E-4
- .02 Elements of air and surface weapon control problems . . . . . E-4
- .40 Recognize and interpret quantities and symbols used in gun weapon control systems . . . . . E-5
- .41 Purpose and operating principles of basic computing mechanisms . . . . . E-5
- .60 Types and operating principles of director and antenna power drives. . . . . E-6
- .61 Adjustments of basic computing mechanisms . . . . . E-6
- .62 Relationship of electrical and mechanical inputs and outputs of a radar, director, computer, stable element, and gun mount of a dual purpose battery . . . . . E-6
- .63 Elements of ASW problem, including use of acoustic homing torpedoes. . . . . E-6
- .80 Variables and constants of initial ballistics . . . . . E-7
- .81 Data flow in all Coast Guard weapon control systems . . . . . E-7

D. TECHNICAL MAINTENANCE

1.00 Practical Factors

- .01 Lubricate weapon control equipment in accordance with lubrication instructions . . . . . E-4
- .02 Make tests of weapon control equipment for continuity, grounds, and shorts . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
FT

D. TECHNICAL MAINTENANCE - Continued

1.00 Practical Factors - Continued

- .03 Inspect motors and generators, clean commutator, and slipring assemblies, and replace brushes . . . . . E-4
- .04 Conduct tests and make repairs to sound powered telephone head sets, hand sets, and circuits . . . . . E-4
- .40 Trace circuits through weapon control switchboards and make repairs as necessary . . . . . E-5
- .60 Inspect and clean director and antenna slipring assemblies . . . . . E-6
- .61 Test, adjust, and replace mechanical weapon control mechanisms . . . . . E-6
- .62 Lubricate and perform shipboard adjustments to gyroscopes used in weapon control equipment . . . . . E-6
- .63 Conduct all tests, including dynamic dummy director and error recorder tests, on a weapons control system and effect repairs . . . . . E-6
- .64 Conduct battery alinement afloat; compute and apply corrections . . . . . E-7
- .81 Analyze transmission, alinement, computer, and rate tests to determine need for adjustment, repair, or replacement of parts . . . . . E-7
- .82 Conduct ASW weapon control system alinement and compute and apply corrections . . . . . E-7
- ★ .83 Inspect the installation, alteration, and repair of assigned weapons equipment . . . . . E-7

2.00 Examination Factors

- .01 Methods of testing resistors, capacitors, potentiometers, transformers, electron tubes, and semiconductors. . . . . E-4
- .02 Performance, Operational, and Maintenance Standards for Electronic Equipment (POMSEE) and Satterwhite systems of preventive maintenance. . . . . E-4
- .40 Application of resistors, potentiometers, coils, transformers, capacitors, electron tubes, and transistors in formers, capacitors, electron tubes and transistors in electronic stages of weapon control equipment . . . . . E-5
- .60 Operating principles of antennas and waveguides pertinent to weapon control equipment . . . . . E-6

E. FIRE CONTROL RADAR

1.00 Practical Factors

- .01 Make operator's adjustments and checks to fire control radars . . . . . E-4
- .40 Aline fire control radar antennas . . . . . E-5
- .41 Perform tests and adjustments necessary for proper operation of a fire control radar . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
FT

E. FIRE CONTROL RADAR - Continued

2.00 Examination Factors

- .01 Operating principles and characteristics of fire control radar . . . . E-4
- .39 Purpose of the following:
  - a. Radar operator's adjustments and checks . . . . . E-4
  - b. Standing wave ratio . . . . . E-5
  - c. Transmitting power . . . . . E-5
  - d. Beacon frequency . . . . . E-5
  - e. Spectrum analysis . . . . . E-6
- .40 Basic operating principles of the following special circuits:  
limiting, differentiating, clamping, cathode, follower, blocking  
oscillator, multi-vibrator, coincidence amplifier, sawtoothed  
generator, phase shifter, converter, klystron, magnetron, discrimi-  
nator, and duplexer . . . . . E-5

F. COMPUTERS AND SERVO LOOPS

1.00 Practical Factors

- .01 Demonstrate all modes of operation of the computer to which assigned. . E-4
- .40 Perform tests necessary for operation of servo and analog  
computing circuits. . . . . E-5
- .41 Test and zero synchros and resolvers . . . . . E-5
- .60 Prepare a weapon control system for alinement by alining synchros  
and other data transmission and indicating/recording devices . . . . E-6
- .61 Trace circuits and analyze failures of servo and analog com-  
puting circuits, making replacements, adjustments, and repairs . . . . E-6

2.00 Examination Factors

- .01 Methods of setting synchros and resolvers to electrical zero . . . . . E-4
- .60 Operating principles of analog computers . . . . . E-6

G. WEAPON DIRECTION AND TARGET DESIGNATION SYSTEMS

1.00 Practical Factors

- .01 Operate weapon direction or target designation systems . . . . . E-4
- .40 Perform operator's test and adjust target designation or weapon  
direction systems . . . . . E-5
- .60 Perform all tests, analyze failures, and effect repairs to  
target designation or weapon direction systems . . . . . E-6
- .80 Train battle station and watchstanding operators on weapon  
direction or target designation system of own ship . . . . . E-7

2.00 Examination Factors

- .60 Weapon direction or target designation system data flow . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
FT

H. GYROS, STABLE ELEMENTS, AND DIRECTORS

1.00 Practical Factors

- .01 Conduct shipboard tests of lead computing sights . . . . . E-4
- .40 Conduct director checks; compute and effect adjustments . . . . . E-5
- .60 Perform tests of director and antenna power drives . . . . . E-6
- .61 Conduct shipboard tests of gyro controlled mechanisms . . . . . E-6
- .80 Analyze failures and effect repairs to director and antenna  
power drives . . . . . E-7

2.00 Examination Factors

- .01 Properties of free and restrained gyros and purpose of damping. . . . . E-4
- ★.02 Purpose, methods, and interpretation of shipboard tests of lead  
computing sights . . . . . E-4
- .40 Purpose and methods of checking a director to a reference plane . . . . . E-5

I. ADMINISTRATION

1.00 Practical Factors

- .01 Keep logs of periodic tests and maintenance in accordance with CG-272 . . . . . E-4
- .40 Make failure reports and keep an ordnance history . . . . . E-5
- .41 Use Navy Stock List of the Ordnance Supply Office and IPB's . . . . . E-5
- .60 Prepare and conduct a shipboard sound powered telephone  
operator's training program . . . . . E-6
- .61 Maintain a Current Ship's Maintenance Project (CSMP) and prepare  
shipyard and tender work requests or job orders . . . . . E-6
- .80 Analyze equipment logs, check-off lists, failure reports, and  
prepare requisitions for material . . . . . E-7
- .81 Use COSAL and SAIL . . . . . E-7
- .82 Prepare firing exercise reports in accordance with CG-272-1 . . . . . E-7

2.00 Examination Factors

- .01 Information found in Ordnance Manual (CG-272 and CG-272-1) . . . . . E-4
- .40 Information found in BuWeps and BuShips publications pertaining  
to weapon control equipment . . . . . E-5
- .41 Purpose and types of entries made in ordnance histories and  
failure reports . . . . . E-5
- .60 Information shown in Current Ship's Maintenance Project (CSMP),  
shipyard and tender work requests or job orders . . . . . E-6
- .80 Purpose and scope of FXP 3 . . . . . E-7

★ SENIOR CHIEF FIRE CONTROL TECHNICIAN (FTCS)

QUALIFICATIONS FOR ADVANCEMENT

	Required for Advancement to FT
1.00 Practical Factors	
.90 Evaluate training schedules, sessions, and classes in weapons areas . .	E-8
.91 Develop course material and simulated operational problems for personnel in the weapons area . . . . .	E-8
2.00 Examination Factors	
.90 Functions and organization of all aspects of the weapons department . . . . .	E-8
.91 Policies and procedures utilized in evaluating, maintaining, and improving material conditions and combat readiness in weapons areas . .	E-8

★ MASTER CHIEF FIRE CONTROL TECHNICIAN (FTCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors	
.95 Provide technical information and advice concerning operational employment of weapons equipment . . . . .	E-9
2.00 Examination Factors	
.95 Administration and direction of activities concerned with servicing, handling, storing, and issuing of ordnance technical material . . . . .	E-9
.96 Tactical and operational utilization of naval guns and gun systems . .	E-9
.97 Organization of a weapons repair facility or mobile ordnance technical unit . . . . .	E-9



★ GUNNER'S MATE (GM)

GENERAL RATING

SCOPE

Gunner's Mates operate, maintain, and repair small arms, ASW surface torpedo tubes, launchers and projectors, guns, gun mounts, and associated handling equipment; make detailed electrical, hydraulic, and mechanical casualty analysis; maintain and repair the various electric, hydraulic, and mechanical systems and servo-systems in the above; inspect ammunition and its ordnance components; inspect and maintain magazines and ammunition stowage spaces; supervise crews assigned to ordnance equipment; maintain histories, logs, and records; and prepare reports.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
GM

A. SAFETY

1.00 Practical Factors

.01	Observe safety precautions in the use of hand and power tools and casualty analysis equipment .....	E-4
.02	Observe safety precautions in working with electrical equipment .....	E-4
.03	Observe safety precautions in overhaul and repair of ordnance equipment .....	E-4
.04	Observe safety precautions in the operation of guns, mounts, projectors, launchers, and torpedo tubes .....	E-4
.05	Observe safety precautions in the handling, stowing, and firing of projectiles and rockets .....	E-4
.06	Observe safety precautions in conducting magazine sprinkler system inspections and tests .....	E-4
.40	Observe safety precautions in making adjustments and measurements to energized equipment .....	E-5
.60	Observe safety precautions in demolition work .....	E-6
.80	Organize and administer a program of safety instruction applicable to ordnance systems, equipment, and facilities .....	E-7
.81	Interpret directives and instructions on safety precautions to identify those applicable to work areas and equipment; establish safeguards, procedures, and standards to ensure compliance by personnel supervised .....	E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
GM

A. SAFETY - Continued

2.00 Examination Factors

- .02 Safety precautions pertaining to the use, handling, and stowage of all types of ammunition, demolition, and pyrotechnics material applicable to the Coast Guard ..... E-4
- .03 Safety precautions and procedures to be observed in the handling and firing of small arms ..... E-4
- .04 Safety precautions and applicable first aid, resuscitation, necessary in electrical work ..... E-4
- .60 Safety and procedures observed in torpedo recovery ..... E-6

B. GUNS AND MOUNTS

1.00 Practical Factors

- .02 Operate ammunition hoists and ammunition handling equipment ..... E-4
- .03 Assemble, disassemble, overhaul, and repair breech mechanisms ..... E-4
- .04 Prepare for firing: guns, mounts, and associated equipment ..... E-4
- .05 Repair, overhaul, and maintain mortars ..... E-4
- .06 Repair, overhaul, and maintain machine guns ..... E-4
- .40 Boresight guns for prescribed ranges ..... E-5
- .41 Check accuracy of train and elevation indicators by tramping ..... E-5
- .42 Test firing cutout and fuze-setting devices ..... E-5
- .43 Use gages and test equipment, such as bore erosion gages, chamber gages, and boresighting equipment ..... E-5
- .49 Inspect, test, maintain, and repair:
  - a. Gun systems (less power drive) ..... E-5
  - b. Electric hydraulic power drives ..... E-6
- .60 Repair and overhaul firing cutout and fuze-setting devices ..... E-6

2.00 Examination Factors

- .01 Gun station responsibilities, except those of gun captain ..... E-4
- .02 Operating principles of guns, their assemblies, sub-assemblies, and component parts ..... E-4
- .03 Function and operation of firing cutout devices ..... E-4
- .04 Methods of setting mechanical fuzes ..... E-4
- .40 Mount and gun captain responsibilities ..... E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
GM

B. GUNS AND MOUNTS - Continued

2.00 Examination Factors

.41 Theory for aligning gun batteries ..... E-5

C. ASW PROJECTORS AND COUNTERMEASURES

1.00 Practical Factors

.01 Operate and maintain nonpower-driven ASW torpedo tubes,  
rocket launchers, and projectors ..... E-4

.02 Prepare ASW launchers and projectors for firing ..... E-4

.40 Operate and maintain ASW weapons associated launching  
equipment ..... E-5

.41 Operate and maintain ASW countermeasure systems ..... E-5

2.00 Examination Factors

.01 Maintenance, prefiring, and postfiring routines on pro-  
jectors, launchers, and torpedo tubes ..... E-4

.40 Maintenance, prefiring, and postfiring routines on ASW  
weapons associated launching equipment ..... E-5

.41 Maintenance and operating routines on ASW countermeasure  
systems ..... E-5

D. FIRE CONTROL AND BALLISTICS

1.00 Practical Factors

.60 Demonstrate ability to operate fire control equipment ..... E-6

2.00 Examination Factors

.02 Function of gun sight telescopes ..... E-4

.40 Function on lead-computing sights ..... E-5

.41 Types of secondary gunfire control ..... E-5

.42 Functions of synchros in fire control ..... E-5

.43 Relationship of fuze-setters to the fire control problem .... E-5

.60 Functions of directors, computers, and radar in gunfire  
control ..... E-6

.61 Ballistics interior and exterior .... E-6

.80 Fire control variables ..... E-7

E. AMMUNITION, DEMOLITIONS, AND MAGAZINES

1.00 Practical Factors

.01 Record magazine temperatures and inspect areas ..... E-4

.02 Test-operate magazine sprinkler systems ..... E-4

.03 Stow pyrotechnics ..... E-4

.04 Maintain magazine sprinkler systems ..... E-4

.40 Supervise crews in the safe and proper procedures for trans-  
ferring, handling and stowage of ammunition and explosives .. E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
GM

E. AMMUNITION, DEMOLITIONS, AND MAGAZINES - Continued

1.00 Practical Factors - continued

- .42 Coordinate and direct maintenance and upkeep of magazines and spaces ..... E-5
- .60 Set up and test electrical firing circuits for demolitions ..... E-6
- .80 Perform tests and inspections to determine salvageable pyrotechnics, rockets, impulse ammunition, demolition charges, and components ..... E-7

2.00 Examination Factors

- .01 Types and characteristics of magazine sprinkler systems ..... E-4
- .02 Types, properties, characteristics, functions, and classifications of explosives ..... E-4
- .03 Types of pyrotechnics and their uses ..... E-4
- .04 Procedures for the use of pyrotechnic equipment ..... E-4
- .05 Types and classifications of ammunition ..... E-4
- .06 Types of projectiles and rockets, color codes, and classifications ..... E-4
- .07 Types of gun ammunition, propelling charges, and index numbers ..... E-4
- .40 Methods of handling and disposing of high-explosive exudate, powdered high-explosive residue, and damaged explosive components ..... E-5
- .41 Types of demolition charges and methods of detonation .... E-5
- .60 Procedures for using demolition equipment ..... E-6

F. SMALL ARMS AND LANDING PARTY EQUIPMENT

1.00 Practical Factors

- .01 Stow and issue small arms ..... E-4
- .02 Assemble, use, and issue landing party equipment ..... E-4
- .03 Operate and maintain small arms, line-throwing guns, and associated equipment ..... E-4
- .40 Conduct small arms training program to include field stripping, cleaning, assembling, basic firing positions, and setting of sights on all small arms assigned to the unit ..... E-5

2.00 Examination Factors

- .01 Types, construction, functions, casualty analysis, and field repair of all small arms and shoulder line-throwing equipment currently used in the Coast Guard ..... E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
GM

F. SMALL ARMS AND LANDING PARTY EQUIPMENT - Continued

2.00 Examination Factors - Continued

- .40 Procedures for using hand grenades ..... E-5
- .60 Overhaul and repair small arms less HQCM equipments ..... E-6

G. ELECTRICITY

1.00 Practical Factors

- .01 Clean electrical contacts and switches ..... E-4
- .02 Make mechanical wire connections ..... E-4
- .03 Locate blown fuses, using a voltage tester, and replace  
with fuses of proper ratings ..... E-4
- .04 Maintenance and handling of storage batteries ..... E-4
- .41 Test and replace electrical circuit components ..... E-5
- .42 Perform analysis of ordnance electrical systems  
malfunctions ..... E-5
- .43 Locate open grounds, and short circuits in energized  
electrical equipment ..... E-5
- .60 Remove, install, mechanically align, and electrically  
zero synchros ..... E-6
- .61 Make tests for short circuits, grounds, and continuity  
of interconnecting cables and wiring between components  
of electrical equipment ..... E-6
- .62 Supervise the maintenance of ordnance electrical  
equipment ..... E-6
- .81 Inspect completed repairs to electrical equipment ..... E-7
- .82 Test and evaluate new or overhauled electrical  
equipment ..... E-7
- .83 Analyze electrical casualties, recommend repair pro-  
cedures, and determine deficiencies in inspection pro-  
cedures ..... E-7
- .84 Diagnose intermittent, recurring, and electrical mal-  
functions ..... E-7

2.00 Examination Factors

- .01 Types and applications of electrical circuit protective  
devices ..... E-4
- .02 Meaning of basic electrical terms and units of  
measure ..... E-4
- .03 Soldering materials and techniques used in the main-  
tenance of electrical equipment ..... E-4
- .04 Types and applications of corrosion prevention and  
moisture protecting materials used in the maintenance  
of ordnance electrical equipment ..... E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
GM

G. ELECTRICITY - Continued

2.00 Examinations Factors - Continued

.05	Operating characteristics of basic electrical measuring instruments .....	E-4
.06	Operating principles and types of d.c. motors and generators .....	E-4
.07	Operating principles and types of a.c. motors .....	E-4
.08	Principles and applications of control circuits employing switches, relays and solenoids .....	E-4
.09	Operating principles of storage batteries .....	E-4
.40	Theory of a.c. and d.c. electricity and principles of magnetism .....	E-5
.41	Principles of electromagnetic induction and application to transformers, motors, and generators .....	E-5
.42	Theory and ordnance applications of servo-amplifiers .....	E-5
.43	Principles of synchros .....	E-5
.44	Applications of non-electronic servosystems .....	E-5
.45	Methods of troubleshooting ordnance equipment .....	E-5
.46	Type and applications of gun test equipment .....	E-5
.60	Principles of operation of servo-systems .....	E-6
.80	Effects of environmental conditions upon operation of ordnance equipment .....	E-7

H. HYDRAULICS AND PNEUMATICS

1.00 Practical Factors

.01	Inspect and service hydraulic reservoirs .....	E-4
.02	Clean, lubricate, and make hydraulic tests of ordnance equipment .....	E-4
.40	Inspect fluid in hydraulic systems for cleanliness; flush and drain systems .....	E-5
.41	Inspect and service hydraulic accumulators .....	E-5
.42	Gas-ejector systems .....	E-5
.60	Overhaul, repair, and adjust hydraulic equipment in mounts .....	E-6
.61	Install and maintain pumps in hydraulic systems .....	E-6
.62	Install valves in hydraulic systems .....	E-6
.63	Analyze pump casualties and make repairs and replacements ...	E-6
.64	Inspect and service recoil, counter recoil .....	E-6
.80	Test, adjust, overhaul, and repair indicator and receiver regulator equipment used in power drives of mounts .....	E-7

2.00 Examination Factors

.01	Principles of operation of pressure gauges .....	E-4
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QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
GM

H. HYDRAULICS AND PNEUMATICS - continued

2.00 Examination Factors - Continued

- .02 Knowledge of the physical properties of fluids, the proper use of lubricants, preservatives, cleaning solutions, and solvents used in weapons department maintenance ..... E-4
- .03 Operation, classification, uses, and common casualties of simple valves and directional valves ..... E-4
- .40 Operation, classification, uses and common casualties of compound and pressure-reducing valves ..... E-5
- .41 Functions and properties of hydraulic fluids ..... E-5
- .42 Theory of hydraulics and pneumatics ..... E-5
- .60 Theory of operation of receiver regulators ..... E-6

I. MECHANICS

1.00 Practical Factors

- .01 Select, use, and care for common handtools ..... E-4
- .02 Use and maintain fixed or portable electric and pneumatic power tools ..... E-4
- .03 Cut, bend, and prepare pipe and tubing ..... E-4
- .04 Repair damaged sealing surfaces, mating areas, threads, sealing checks and ports ..... E-4
- .05 Replace faulty mechanical hardware, such as nuts, bolts, rivets, and seals ..... E-4

2.00 Examination Factors

- .01 Types and uses of non-sparking tools ..... E-4
- .02 Techniques and uses of measuring devices and gauges ..... E-4
- .03 Principles and applications of basic machines ..... E-4
- .04 Shop mathematics ..... E-4

J. DRAWINGS AND SCHEMATICS

1.00 Practical Factors

- .01 Locate and identify major components, subassemblies, and component parts by reference to block and circuit diagrams and mechanical drawings ..... E-4
- .02 Trace common electrical circuits using appropriate prints ..... E-4
- .40 Read and interpret: mechanical diagrams, blueprints, sketches, and hydraulic diagrams ..... E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
GM

J. DRAWINGS AND SCHEMATICS - Continued

2.00 Examination Factors

- .01 Types and uses of drawings and maintenance charts used in the operation and maintenance of gun equipment ..... E-4
- .02 Types and uses of blueprint views and projections ..... E-4
- .03 Symbols commonly used in: electrical, mechanical, hydraulic, and pneumatic diagrams, blueprints, and schematics ..... E-4

K. ADMINISTRATION AND PUBLICATIONS

1.00 Practical Factors

- .02 Record information in weapons department logs, maintain check-off lists, and failure reports ..... E-4
- .03 Maintain equipment histories on weapons, components, and test and handling equipment ..... E-4
- .04 Use maintenance requirement cards (MRC's) ..... E-4
- .06 Maintain ammunition records and conduct ammunition inventories ..... E-4
- .40 Prepare rough-draft job orders and work requests ..... E-5
- .41 Maintain a Current Ship's Maintenance Project (CSMP) ..... E-5
- .42 Conduct armament inventories ..... E-5
- .43 Maintain consumable supplies and obtain replacements ..... E-5
- .44 Requisition repair parts and standard stock items ..... E-5
- .45 Prepare equipment histories..... E-5
- .46 Prepare rough-draft work requests and job orders for shipyard and base work ..... E-5
- .60 Supervise and coordinate the planned maintenance system (PMS) aboard ship ..... E-6
- .61 Use allowance lists, "OP's", "IPB's", and forms in requisitioning, invoicing, and survey of material in the weapons department ..... E-6
- .62 Implement loading and stowage plans for spare parts and consumables ..... E-6
- .63 Prepare loading and stowage plans for explosives and ammunitions ..... E-6
- .80 Prepare weapons department reports ..... E-7
- .81 Principles of storing ordnance material, space layout, and ordnance storeroom maintenance ..... E-7

2.00 Examination Factors

- .01 Organizational structure of weapons department ..... E-4
- .02 Knowledge and use of publications applicable to safety, operation, maintenance, and repair of guns, mounts, and small arms used in the Coast Guard ..... E-4
- .03 Types and uses of publications employed in identifying ordnance supply items ..... E-4



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
GM

K. ADMINISTRATION AND PUBLICATION - Continued

2.00 Examination Factors - continued

- .04 Information, purpose, and types of entries made in logs, records, check-off lists, and reports applicable to the GM rating ..... E-4
- .60 Regulations concerning accountability, procurement, maintenance, stowage, and transmission of classified records, reports, and publications ..... E-6
- .61 Types and requirements of administrative, operational, material, and related inspections ..... E-6
- .81 Maintain records of subhead expenditures ..... E-7

SENIOR CHIEF GUNNER'S MATE (GMCS)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .90 Conduct training programs at district units without ordnance personnel; schedule and supervise district small arms training program, and evaluate firing reports ..... E-8
- .91 Manage and supervise appropriate subhead funds at district level to procure ammunition and supplies chargeable thereto ..... E-8
- .92 Conduct material inspections of all ordnance departments within district providing technical maintenance assistance where required ..... E-8
- .93 Review shipyard work requests submitted by district units ..... E-8

2.00 Examination Factors

- .90 Ship training exercises as set forth in FXP's and modified for Coast Guard use ..... E-8
- .91 Small arms range requirements to include ballistics of all small arms in Coast Guard, range dimensions and acceptable substitutes and acceptable range materials to maintain safety ..... E-8
- .92 Types of supplies and repairs chargeable to ordnance funds, source of supplies and repairs purchased by district and procedures for obtaining repairs, and small parts for Navy-owned equipment ..... E-8
- .93 Procedures for conducting complete system alignment of all FC systems in the Coast Guard ..... E-8

MASTER CHIEF GUNNER'S MATE (GMCM)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
GM

1.00 Practical Factors

- .95 Develop training curricula and training aids for all types of formal and informal ordnance training programs ..... E-9
- .96 Administer supervise and evaluate subordinate instructors in formal training programs ..... E-9

2.00 Examination Factors

- .95 Coast Guard ordnance capabilities and objectives ..... E-9
- .96 Methods of evaluation of ordnance training programs ..... E-9
- .97 Administration of ceremonial drill detachments as set forth in Navy Landing Party Manual ..... E-9

TORPEDOMAN'S MATE (TM)

SERVICE RATING

SCOPE

Torpedoman's Mates maintain, test, repair and overhaul underwater ordnance, such as: torpedoes, antisubmarine rockets, and depth charges launched from naval vessels and aircraft; maintain and repair underwater ordnance launching equipment; supervise stowage of underwater ordnance; test and maintain torpedo test equipment; serve on surface craft at aviation activities and at repair shops; and prepare for launching, and launch and recover torpedoes.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TM

A. SAFETY

1.00 Practical Factors

- .01 Observe safety precautions when charging, boosting and bleeding torpedo air flasks. . . . . E-4
- .02 Demonstrate under simulated conditions the rescue of a person in contact with an energized electrical circuit, resuscitation of a person unconscious from electrical shock, and treatment for electrical and acid burns . . . . . E-4
- .03 Demonstrate while servicing electronic components of torpedoes, safety precautions, such as tagging switches, removing fuses, grounding test equipment, and using shorting bars and rubber mats . . . E-4
- .04 Demonstrate knowledge of high-pressure air and hydraulic safety precautions . . . . . E-4

2.00 Examination Factors

- .01 Safety precautions applicable to handling various type torpedoes. . . . E-4
- .02 Effects of electrical shock . . . . . E-4
- .03 Safety precautions in handling and stowing of warheads, depth charges, boosters, detonators, igniters, impulse charges and primers . . . . . E-4
- .04 Safety precautions to be observed in the maintenance of torpedoes, depth charges and associated equipment. . . . . E-4

B. PREFIRING, RECOVERY, POSTFIRING AND SHIPPING ROUTINES

1.00 Practical Factors

- .01 Install prescribed accessories for torpedoes. . . . . E-4
- .40 Perform routine operational maintenance for upkeep of ready and fully ready torpedoes to which assigned, following checkoff lists . . . E-5
- .41 Perform preliminary and final adjustments on a torpedo, following checkoff lists. . . . . E-5
- .42 Perform torpedo postrun treatment (excluding film analysis) following checkoff lists. . . . . E-5
- .60 Conduct torpedo-firing system transmission check, using appropriate indicator panel . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TM

B. PREFIRING, RECOVERY, POSTFIRING AND SHIPPING ROUTINES - Continued

1.00 Practical Factors - Continued

.61 Direct recovery, handling, loading and shipping of torpedoes and their components. . . . . E-6

2.00 Examination Factors

.01 Immediate postrun treatment required of type torpedo fired from own ship. . . . . E-4

.60 Elements of torpedo fire-control problem:  
a. Line of sight . . . . . E-6  
b. Angle of impact . . . . . E-6  
c. Sight angles. . . . . E-6

C. TORPEDO PROPULSION AND CONTROL MECHANISM

1.00 Practical Factors

.01 Locate and identify components, assemblies and subassemblies of torpedoes by reference to associated drawings and diagrams. . . . . E-4

.60 Dissassemble, clean, inspect, reassemble and test propulsion and control mechanisms of steam torpedoes . . . . . E-6

2.00 Examination Factors

.39 Operating principles and functions of the following torpedoes and their components:  
a. Steam/mechanical torpedoes. . . . . E-4  
b. Acoustically controlled, electrically propelled torpedoes . . . . . E-4  
c. Chemically driven torpedoes . . . . . E-5

D. TORPEDO-LAUNCHING EQUIPMENT

1.00 Practical Factors

.01 Locate and identify components, assemblies and subassemblies of torpedo mounts, tubes and launchers by reference to associated drawings and diagrams . . . . . E-4

.40 Test and maintain torpedo mounts and/or tubes or racks (including tube postfiring maintenance routine) following checkoff list and observing safety precautions. . . . . E-5

.60 Analyze casualties on, and make repairs to, torpedo-launching equipment . . . . . E-6

2.00 Examination Factors

.01 Stations and duties of personnel assigned to torpedo tubes (fixed and trainable), mounts and launching racks . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TM

E. BASIC ELECTRICITY, ELECTRONICS AND ACOUSTICS

1.00 Practical Factors

- .01 Identify electrical, electronic and hydraulic symbols used in schematic and wiring diagrams of torpedoes and exploder mechanisms and torpedo-launching equipment. . . . . E-4
- .02 Operate voltmeter, megger, multimeter, oscilloscope and stroboscope . . . . . E-4
- .03 Test and charge torpedo storage batteries . . . . . E-4
- .04 Identify electrical characteristics of capacitors, resistors and internal connections employed in electronic circuits by Mil-Std . . . . . E-4
- .05 Perform continuity, ground and short-circuit tests on a torpedo propulsion motor. . . . . E-4
- .06 Calculate current, voltage and resistance in series and parallel d.c. circuits containing not more than four elements. . . . . E-4
- .07 Test transformers and vacuum tubes. . . . . E-4
- .08 Operate test sets issued for use with torpedo workshop equipment. . . . . E-4
- .40 Locate equipment casualties to subassemblies or parts in torpedo circuits. . . . . E-5
- .41 Test and replace parts, such as resistors, capacitors, and coils in a.c. and d.c. circuits . . . . . E-5
- .42 Perform operational maintenance checks on test sets associated with torpedoes. . . . . E-5
- .43 Inspect and clean commutators; inspect and replace brushes on torpedo-rotating electrical machinery such as motors or generators. . . . . E-5
- .60 Perform all electrical and electronic circuit tests of a torpedo; make required adjustments and replace FIR components. . . . . E-6
- .61 Make tests for short circuits, grounds and continuity in wiring harnesses and in anticircular run (ACR), attack cutout (ACO) and ceiling switch circuits . . . . . E-6
- .80 Verify that a torpedo, as a completely assembled unit, performs during all pre-firing tests as prescribed in applicable ordnance pamphlets (OP's). . . . . E-7

2.00 Examination Factors

- .01 Fundamentals of electricity . . . . . E-4
- .02 Principles of direct and alternating current. . . . . E-4
- .03 Application of the laws of magnetism to d.c. motors and generators. . . . . E-4
- .04 Electrical and physical characteristics of electric motors and generators. . . . . E-4
- .05 Types, structure and electrical characteristics of lead, acid and silver cell storage batteries . . . . . E-4
- .06 Basic principles of sound as applicable to acoustic torpedoes . . . . . E-4
- .40 Functions of transducers, transmitters, receivers, servo-systems, relay control circuits and vibrators in torpedo circuits. . . . . E-5
- .42 Purpose and operation of:
  - a. Enablers. . . . . E-5
  - b. Anticircular run (ACR) circuits . . . . . E-5
  - c. Stratum circuits. . . . . E-5
  - d. Depth cutout (DCO) circuits . . . . . E-5
  - e. Floor and ceiling switches. . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TM

- E. BASIC ELECTRICITY, ELECTRONICS AND ACOUSTICS - Continued
  - 2.00 Examination Factors - Continued
    - .60 Functions of resistors, potentiometers, capacitors, transformers, and vacuum tubes in oscillating, switching, detector, automatic volume control, rectifier, feedback network, and a.c. and d.c. amplifier circuits. . . . . E-6
    - .61 Physical structure and operating principles of electron tubes, transistors, and printed circuits, used in torpedoes. . . . . E-6
  
- F. EXPLOSIVES AND EXPLODER MECHANISMS
  - 1.00 Practical Factors
    - .40 Make allowable tests and adjustments to, and install, an exploder mechanism. . . . . E-5
    - .60 Make authorized tests and repairs to torpedo exploder-mechanism test equipment (multimeter-type circuits) . . . . . E-6
  - 2.00 Examination Factors
    - .01 Characteristics of explosives contained in warheads, depth charges, boosters, detonators, igniters, impulse charges, and primers. . . . . E-4
    - .40 Functions of torpedo exploder-mechanisms test equipment . . . . . E-5
  
- G. PNEUMATIC AND HYDRAULIC SYSTEMS
  - 1.00 Practical Factors
    - None.
  - 2.00 Examination Factors
    - .01 Functions and operating principles of hydraulic systems associated with torpedoes and torpedo-launching systems. . . . . E-4
    - .40 Functions of pneumatic systems associated with torpedoes. . . . . E-5
  
- H. DEPTH CHARGES AND ASSOCIATED EQUIPMENT
  - 1.00 Practical Factors
    - .01 Locate and identify components, assemblies and subassemblies of depth-charge release tracks by reference to associated drawings and diagrams. . . . . E-4
    - .02 Inspect, clean, lubricate and test depth-charge tracks and release mechanisms on own ship. . . . . E-4
    - .03 Perform routine inspection and maintenance on depth charges . . . . . E-4
    - .40 Purge depth charge release mechanism, refill with required liquids, and restore to operating condition. . . . . E-5
    - .60 Perform complete tests including disassembly and reassembly of depth charges and components. . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TM

H. DEPTH CHARGES AND ASSOCIATED EQUIPMENT - Continued

2.00 Examination Factors

- .01 Types, operating principles, and testing of depth charges and their components. . . . . E-4
- .02 Types and operating principles of release gear for depth charges. . . . . E-4
- .40 Methods of laying depth charges . . . . . E-5

I. UNDERWATER ORDNANCE MAINTENANCE

1.00 Practical Factors

- .01 Inspect, clean and lubricate torpedoes, mounts, tubes and launching gear in accordance with technical maintenance publications. . . . . E-4
- .02 Select and demonstrate use of soldering equipment . . . . . E-4
- .03 Check pressure seals ("O" rings) and ensure that torpedo is watertight. . . . . E-4
- .04 Sweat a watertight or airtight flange, joint, stud or lead. . . . . E-4
- .40 Disassemble and reassemble an afterbody on own ship or station. . . . . E-5
- .60 Conduct deckrun of torpedo using checkoff list. . . . . E-6
- .61 Effect authorized field changes to electronic components of torpedoes in accordance with instructions and diagrams. . . . . E-6
- .62 Perform shop tests and adjustments on an acoustic torpedo . . . . . E-6
- .80 Perform casualty analysis on defective acoustic torpedoes and effect repairs or replacements as required. . . . . E-7

2.00 Examination Factors

- .01 Major sections of acoustic torpedo and component parts of each section . . . . . E-4
- .02 Power tools, handtools, lubricants, preservatives and cleaning materials used in the maintenance of torpedoes, depth charges and associated equipment. . . . . E-4
- .40 Uses of test equipment for torpedoes. . . . . E-5

J. MAGAZINES

1.00 Practical Factors

None.

2.00 Examination Factors

- .01 Precautionary measures to be followed whenever magazines are to be ventilated. . . . . E-4
- .02 Types of magazine cooling, ventilating and sprinkler systems. . . . . E-4
- .40 Methods of operating magazine cooling, ventilating and sprinkler systems . . . . . E-5
- .60 Methods of testing magazine cooling ventilating and sprinkler systems . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TM

K. ADMINISTRATION

1.00 Practical Factors

- .01 Record required information in the daily worklog and torpedo record book . . . . . E-4
- .02 Locate information found in ordnance pamphlets (OP's) necessary for operation, maintenance and repair of torpedoes, depth charges and associated equipment; enter corrections to publications . . E-4
- .03 Prepare a Rudtorpe Form (BuWeps Instruction 8510.8 series). . . . . E-4
- .40 Locate information found in BuWeps publications, such as Instructions, Notices and Allowance Parts Lists; enter changes to publications. . . . . E-5
- .41 Take, record and report inventories of tools and portable test equipment available for operation, maintenance and repair of underwater ordnance . . . . . E-5
- .42 Obtain part and stock numbers from technical and supply publications and prepare requisitions for tools and replacement parts. . . . . E-5
- .60 Prepare job orders and/or work requests . . . . . E-6
- .80 Organize, supervise and train personnel in the operation, maintenance and repair of underwater ordnance . . . . . E-7
- .81 Prepare and complete periodic or recurring reports concerning performance and/or maintenance of underwater ordnance . . . . . E-7
- .82 Maintain a current ship's maintenance project (CSMP). . . . . E-7
- .83 Fill out Torpedo Firing Report (NavWeps Forms 8510/2, 8510/2A, and 8510/2B) in accordance with appropriate BuWeps instructions . . . . E-7

2.00 Examination Factors

- .01 Procedures required to obtain necessary technical publications. . . . . E-4
- .40 Purpose of the Functional Item Replacement (FIR) program. . . . . E-5
- .80 Duties and responsibilities involved in handling rocket motors on own ship or station. . . . . E-7





BT



DC



EM



EN



ET



MM



MR



SF



TT

# ENGINEERING AND HULL GROUP III

Boilerman	BT
Damage Controlman	DC
Electrician's Mate	EM
Engineman	EN
Electronics Technician	ET
Machinist's Mate	MM
Machinery Repairman	MR
Shipfitter	SF
Telephone Technician	TT

BOILERMAN (BT)

GENERAL RATING

SCOPE

Boilermen operate all types of marine boilers and fireroom machinery; transfer, test, and take inventory of fuels and water; maintain and repair boilers, pumps, and associated machinery.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BT

A. BOILER OPERATION

1.00	Practical Factors	
.01	Operate fuel oil burners and registers . . . . .	E-4
.02	Regulate water level in a steaming boiler . . . . .	E-4
.03	Blowdown gage glasses using the proper procedure . . . . .	E-4
.04	Detect high- and low-water conditions by observing gage glass using gage glass blowdown valves . . . . .	E-4
.05	Cut in and secure feed water regulator . . . . .	E-4
.06	Test feed water alarms . . . . .	E-4
.07	Detect signs of oil in fuel oil heater drain inspection tank, shift drains to bilges, and shift heaters . . . . .	E-4
.08	Shift fuel oil suction and clear fuel oil system of water . . . . .	E-4
.09	Regulate forced draft blowers in local manual or by remote manual for combustion of fuel oil by watching periscope and noting furnace conditions . . . . .	E-4
.10	Regulate fuel oil temperature . . . . .	E-4
.11	Change, clean, and maintain atomizer parts . . . . .	E-4
.12	Line up fuel oil system and recirculate oil; regulate firing rate by use of a micrometer valve or a return flow valve. . . . .	E-4
.13	Open root valve, drain and operate soot blowers for blowing tubes in proper sequence . . . . .	E-4
.14	Shift control to local manual, remote manual, and automatic operation of feed water controls, if fitted . . . . .	E-4
.15	Take charge of fireroom auxiliary watch in port . . . . .	E-4
.16	Demonstrate proper use of bottom and surface blow valves on boilers . . . . .	E-4
.40	Cut in and parallel additional boilers after one boiler is on the line . . . . .	E-5
.41	Light-off without steam pressure . . . . .	E-5
.60	Conduct required inspections preparatory to reporting fire- room ready to answer all bells . . . . .	E-6
.61	Be qualified to stand engineering watch officer at sea and in port . . . . .	E-6
.80	Supervise fireroom personnel when performing full-power and economy runs . . . . .	E-7
2.00	Examination Factors	
.01	Construction and operating principles of naval boilers. . . . .	E-4
.02	Symptoms, causes, prevention and correction of priming, foaming and carryover in boilers . . . . .	E-4
.03	Standard methods of locating and identifying boiler tubes by row and number . . . . .	E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BT

A. BOILER OPERATION - Continued

2.00 Examination Factors - Continued

.04	Principles of boiler circulation and steam generation . . . . .	E-4
.40	Procedures to be followed when single furnace boilers are to be cut in or out . . . . .	E-5
.41	Lighting-off, operating and securing procedures on boilers equipped with automatic combustion control equipment . . . . .	E-5
.60	Lighting-off, operating and securing procedures on all types of naval boilers . . . . .	E-6
.61	Causes of boiler operating troubles indicated by the following symptoms or difficulties:	
a.	High superheater outlet . . . . .	E-6
b.	Low superheater outlet temperature . . . . .	E-6
c.	Sudden drop in superheater outlet temperature . . . . .	E-6
d.	Carryover . . . . .	E-6
e.	Low steam pressure . . . . .	E-6
f.	High feed water consumption . . . . .	E-6
g.	Oil impingement; carbon or soot deposits . . . . .	E-6
h.	High fuel oil consumption . . . . .	E-6

B. BOILER MAINTENANCE AND REPAIR

1.00 Practical Factors

.01	Clean watersides of a boiler, using power-driven tube cleaners. .	E-4
.02	Clean firesides of a boiler, using approved methods . . . . .	E-4
.03	Clean and inspect boiler manhole cover seats and handhole plate seats; fit gaskets on boiler manhole covers and handhole plates . . . . .	E-4
.04	Refit boiler gage glasses with new glass, mica protector and gaskets, and torque studs as required . . . . .	E-4
.05	Spray fireside surface with metal conditioning compound . . . . .	E-4
.06	Clean and check smoke indicator . . . . .	E-4
.07	Locate and grease boiler sliding feet . . . . .	E-4
.08	Test register air doors for proper operation . . . . .	E-4
.09	Dismantle and reassemble boiler internal fittings . . . . .	E-4
.10	Install manhole and handhole plates and tighten or make adjust- ments as necessary to pass a hydrostatic test . . . . .	E-4
.40	Select and use packing and gasket material . . . . .	E-5
.41	Renew gaskets on boiler casing panels and doors . . . . .	E-5
.42	Repack and replace parts on soot blowers . . . . .	E-5
.43	Inspect oil burner atomizers for wear and damage . . . . .	E-5
.44	Adjust oil burner atomizer with reference to the diffuser plates . . . . .	E-5
.45	Test and calibrate gages and repair or renew internal parts as needed . . . . .	E-5
.46	Maintain and repair boiler power-driven tube cleaners . . . . .	E-5
.60	Adjust boiler control components . . . . .	E-6
.61	Make bench tests and calibration of remote water level indicators . . . . .	E-6
.62	Set and test boiler safety valves . . . . .	E-6
.63	Inspect boiler casing for tightness and structural soundness; conduct required tests . . . . .	E-6
.64	Check and set soot blowers for blowing proper arcs and for steam pressure. . . . .	E-6
.65	Replace or plug defective boiler tubes . . . . .	E-6

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
BT

**B. BOILER MAINTENANCE AND REPAIR - Continued**

1.00 Practical Factors - Continued

- .66 Conduct hydrostatic tests on boilers and make required inspection for tightness and strength . . . . . E-6
- .67 Trouble shoot electrical control circuits of auxiliary boilers. This includes proper methods of testing circuits for grounds, proper operation of relays, solenoids, etc. . . . . E-6
- .80 Inspect boiler uptakes and smoke pipes to determine their condition . . . . . E-7
- .81 Lap, grind and burnish seats, replace parts as required, and hydrostatically test safety valves, if facility is available. . . . . E-7
- .82 Make detailed inspection of firesides and watersides of boiler. . . . . E-7

2.00 Examination Factors

- .40 Effects of:
  - a. Low and excessive alkalinity and of low phosphate residual on the watersides of a boiler . . . . . E-5
  - b. Scale on the watersides of a boiler . . . . . E-5
  - c. Fuel oil and dirt on the watersides of a boiler . . . . . E-5
- .60 Procedure for boiling-out boilers . . . . . E-6
- .61 Construction and operating principles of:
  - a. Boiler instruments . . . . . E-6
  - b. Boiler and superheater safety valves . . . . . E-6
- .62 Design features and details of construction of boilers:
  - a. Metal characteristics of tubes, headers and drums . . . . . E-6
  - b. Construction of boiler casings and uptakes . . . . . E-6
- .80 Approved methods of laying-up idle boilers . . . . . E-7
- .81 Purpose of each type of boiler hydrostatic test and when conducted . . . . . E-7
- .82 Factors governing boiler and fireroom machinery efficiency, causes of poor performance and appropriate remedies . . . . . E-7

**C. FIREROOM AUXILIARIES**

1.00 Practical Factors

- .01 Sample and inspect lubricating oil in fireroom auxiliary machinery . . . . . E-4
- .02 Lineup, start and secure forced draft blowers, and check for normal operating conditions . . . . . E-4
- .03 Lineup, start and secure fuel oil service pumps, and check for normal operating conditions . . . . . E-4
- .04 Lineup, start, operate and secure fire and/or bilge pumps to:
  - a. Pump bilges . . . . . E-4
  - b. Supply water to fire and cooling main . . . . . E-4
- .05 Lineup, start, operate and secure emergency feed pump to:
  - a. Feed steaming boilers, using hot or cold feed water suction . . . . . E-4
  - b. Fill idle boilers with feed water . . . . . E-4
  - c. Add boiler compound to boilers. . . . . E-4
- .06 Disassemble, clean and assemble lubricating oil coolers on fireroom auxiliary machinery . . . . . E-4
- .07 Lineup, start, operate and secure fireroom auxiliary turbines; check for normal operation . . . . . E-4
- .08 Lineup, start, operate and secure boiler feed pumps . . . . . E-4
- .09 Maintain, operate and repair distilling plants . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BT

C. FIREROOM AUXILIARIES - Continued

1.00 Practical Factors - Continued

- .40 Lineup, start, operate and secure fire and/or bilge pumps to ballast and deballast fuel oil tanks . . . . . E-5
- .41 Lineup, start, operate and secure fuel oil transfer pump for fuel oil transfer . . . . . E-5
- .42 Lineup, start, operate and secure emergency feed pumps to transfer feed water . . . . . E-5
- .60 Lineup, start, operate and secure emergency feed pump to hydrostatically test boilers . . . . . E-6

2.00 Examination Factors

- .01 Construction and use of fireroom valves . . . . . E-4
- .02 Construction principles of variable stroke, rotary, reciprocating, eductor and centrifugal type pumps . . . . . E-4
- .03 Proper installation, allowable wear and purpose of zincs. . . . . E-4
- .04 Construction and operating principals of forced draft blowers . . . . . E-4
- .40 Construction and operating principles of auxiliary turbines . . . . . E-5
- .41 Construction and operating principles of speed-limiting governors, speed-regulating governors and overspeed trips . . . . . E-5
- .60 Adjustment of speed-limiting governors, speed-regulating governors and overspeed trips . . . . . E-6

D. AUXILIARY REPAIR

1.00 Practical Factors

- .01 Inspect and clean strainers . . . . . E-4
- .02 Repack valve stems, renew bonnet gaskets, and grind and lap-in seats and disks on high pressure valves . . . . . E-4
- .03 Clean flanges and replace gaskets in main and auxiliary steamlines . . . . . E-4
- .40 Disassemble, repair or replace parts in high- and low-pressure steamtraps . . . . . E-5
- .41 Grind-in valve seats and disks on water end of a reciprocating pump. . . . . E-5
- .42 Repair and replace parts of steam valve gear on reciprocating pumps . . . . . E-5
- .43 Adjust tappets for proper piston stroke on reciprocating pumps. . . . . E-5
- .44 Repack pump end of a reciprocating pump . . . . . E-5
- .45 Set relief valves on fireroom auxiliaries . . . . . E-5
- .46 Repair insulation and lagging on fireroom pipelines . . . . . E-5
- .47 Dress main and auxiliary steamline flanges . . . . . E-5
- .48 Replace lubricating oil pump parts on fireroom auxiliary machinery . . . . . E-5
- .60 Fit rings to reciprocating pumps . . . . . E-6
- .61 Replace power rotor and idler rotors on triple-screw high-pitch rotary pumps . . . . . E-6
- .62 Replace thrust and shaft bearings on fireroom auxiliary machinery, exclusive of electrical equipment . . . . . E-6
- .63 Replace carbon packing rings and oil seal rings in fireroom auxiliary machinery . . . . . E-6
- .64 Make repairs to variable stroke, rotary and reciprocating type pumps; check clearances and alignment. . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BT

D. AUXILIARY REPAIR - Continued

1.00 Practical Factors - Continued

- .65 Renew impellers, casing rings and wearing rings; check clearances and alignment on centrifugal pumps . . . . . E-6
- .80 Disassemble, clean, repair and assemble fuel oil heaters and conduct required hydrostatic tests . . . . . E-7
- .81 Set pilot valve stem clearance, shim connecting rods, and inspect and renew parts as required; reassemble and test constant pressure pump governors. . . . . E-7

2.00 Examination Factors

None.

E. BOILER REFRACTORIES

1.00 Practical Factors

- .40 Repair burner cone, using plastic firebrick . . . . . E-5
- .41 Replace small area in furnace floor and wall, using appropriate refractories . . . . . E-5
- .80 Renew boiler furnace brickwork and insulation . . . . . E-7

2.00 Examination Factors

- .40 Types, purposes and location of furnace refractories . . . . . E-5

F. FUEL AND WATER

1.00 Practical Factors

- .01 Perform chemical tests for boiler and feed water . . . . . E-4
- .02 Sound fuel oil tanks . . . . . E-4
- .03 Follow prescribed procedures for calculating amounts of chemicals to be used for boiler water treatment . . . . . E-4
- .04 Test fuel oil service, standby and storage tanks for presence of water . . . . . E-4
- .60 Lineup fuel oil system for receiving, transferring or discharging fuel oil . . . . . E-6
- .61 Empty fuel oil storage tanks and ballast with sea water in accordance with liquid loading sequence . . . . . E-6
- .80 Organize and assign personnel to fueling stations . . . . . E-7

2.00 Examination Factors

- .01 Chloride and hardness limits of makeup feed water . . . . . E-4
- .02 Limits of chloride, alkalinity, hardness, pH, and phosphate content of water in steaming boilers . . . . . E-4
- .03 Types and frequency of boiler water and feed water tests . . . . . E-4
- .40 Sources of salt contamination in boiler feed water . . . . . E-5
- .41 Procedure for and purpose of each fuel oil test . . . . . E-5

G. BLUEPRINTS AND MATHEMATICS

1.00 Practical Factors

- .01 Read and work from mechanical drawings . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BT

G. BLUEPRINTS AND MATHEMATICS - Continued

2.00 Examination Factors

- .40 Arithmetical computations using fractions, decimals, and percentages . . . . . E-5
- .60 Computations of volumes and areas using formulas . . . . . E-6

H. CASUALTY CONTROL AND SAFETY PRECAUTIONS

1.00 Practical Factors

- .01 Locate principal isolation valves in engineering and adjacent spaces . . . . . E-4
- .02 Demonstrate knowledge of proper casualty procedures for all fireroom equipment . . . . . E-4
- .60 Split or cross-connect the following engineering systems:
  - a. Main steam . . . . . E-6
  - b. Auxiliary steam . . . . . E-6
  - c. Main feed . . . . . E-6
  - d. High- and low-pressure drains . . . . . E-6
  - e. Fire main . . . . . E-6
  - f. Cooling water . . . . . E-6
  - g. Fuel oil suction . . . . . E-6
  - h. Auxiliary exhaust . . . . . E-6

2.00 Examination Factors

- .38 Safety precautions involved in performing tasks appropriate to applicable rates as listed under all 1.00 Practical Factors of all subject headings.
- .39 Procedures to be followed in determining and correcting the following:
  - a. Failure of automatic combustion control . . . . . E-4
  - b. Loss of fuel oil suction . . . . . E-4
  - c. Loss of feed suction . . . . . E-4
  - d. Failure of fuel oil service pump . . . . . E-4
  - e. Water gage glass carries away on a boiler . . . . . E-4
  - f. Low water in a boiler . . . . . E-4
  - g. High water in a boiler . . . . . E-4
  - h. Class A, B and C fires . . . . . E-4
  - i. Failure of emergency feed pump to take suction . . . . . E-4
  - j. Boiler tube or other pressure part carries away . . . . . E-4
  - k. Major fuel oil leak . . . . . E-4
  - l. Oil in fuel oil heater drain . . . . . E-4
  - m. Water in the fuel oil . . . . . E-4
  - n. Fire in the boiler casing . . . . . E-4
  - o. Forced draft blower failure . . . . . E-4
  - p. Brick or plastic falls out of furnace wall . . . . . E-4
  - q. Thermometer does not register normal increase in temperature from superheater after boiler is lit-off. . . . . E-4
  - r. Conditions requiring lifting superheater safety valves by hand . . . . . E-5
  - s. Steaming boiler operating pressure drops below 85%. . . . . E-5
  - t. High salinity in boiler water when boiler is being steamed. . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BT

I. ADMINISTRATION

1.00 Practical Factors

- .01 Compute and record daily fuel oil and water receipts and expenditures . E-4
- .40 Take charge of a fireroom watch or boiler control station when  
underway . . . . . E-5
- .60 Locate and use appropriate sections of BuShips Manual, manufacturers'  
technical manuals, mechanical drawings, and handbooks to obtain data  
when repairing boiler and fireroom machinery . . . . . E-6
- .61 Prepare, make entries in, and maintain the Current Ship's Main-  
tenance Project (CSMP) for machinery and equipment . . . . . E-6
- .80 Organize and supervise the work and training of personnel in phases  
of operation, maintenance, and repair of marine boilers and  
auxiliaries . . . . . E-7
- .81 Estimate time, labor, and material needed for repair of boiler  
and fireroom equipment . . . . . E-7
- .82 Supervise the preparation of daily, weekly, monthly, quarterly,  
semiannual and annual checkoff lists . . . . . E-7
- .83 Prepare boiler water records . . . . . E-7
- .84 Prepare tender or shipyard work requests; conduct inspections, maintain  
progress charts and make required reports . . . . . E-7
- .85 Order fireroom supplies and materials using Navy Stock List of  
General Stores . . . . . E-7
- .86 Use allowance lists to determine repair parts, tools, and supplies  
to be kept on board . . . . . E-7
- .87 Obtain replacement parts and supplies; maintain inventory . . . . . E-7
- .88 Prepare a monthly summary . . . . . E-7

2.00 Examination Factors

- .80 Procedures for submitting reports and samples in connection with  
boiler tube failures or unsatisfactory boiler conditions . . . . . E-7



★ SENIOR CHIEF BOILERMAN (BTCS)

GENERAL REQUIREMENTS

Chief, Boilermen (BTC), eligible to participate in the E-8 examination for Senior Chief Boilerman (BTCS), should be knowledgeable of both the examination factors and the knowledge aspects of the practical factors required of the MM3 and MM2.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BT

1.00 Practical Factors

- .90 Advise personnel regarding boiler and fireroom plant efficiency and on how to recognize and correct poor performance . . . . . E-8
- .91 Train personnel in the principles and supervise them in the operation of the following equipment:
  - a. Boilers . . . . . E-8
  - b. Pumps . . . . . E-8
  - c. Auxiliary heat exchangers . . . . . E-8
  - d. Auxiliary turbines . . . . . E-8
  - e. Safety devices . . . . . E-8
  - f. Fireroom piping systems . . . . . E-8
- .92 Instruct, train, and supervise personnel in casualty procedures . . . . . E-8
- .93 Assist in planning projects to be accomplished by the engineering department during availabilities and supervise scheduled work . . . . . E-8
- .94 Advise subordinate personnel in the procedures for preparing engineering reports and base or shipyard work requests and for maintaining engineering records . . . . . E-8
- .941 Prepare technical lesson plans on the maintenance and operation of equipment and systems, and non-technical lesson plans on training and administration . . . . . E-8

2.00 Examination Factors

- .90 General contents and scope of the NavShips Technical Manual and applicable Commandant's Instructions on standards for operation, maintenance, and repair of assigned equipment . . . . . E-8
- .91 Preparation of check-off lists, work requests, and engineering records and logs . . . . . E-8

★ MASTER CHIEF BOILERMAN (BTCM)

GENERAL REQUIREMENTS

Senior Chief Boilermen (BTCS), eligible to participate in the E-9 examination for Master Chief Boilerman (BTCM), should be knowledgeable of both the examination factors and the knowledge aspects of the practical factors currently required of the MM1 and MMC.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BT

1.00 Practical Factors

- .95 Supervise personnel in the repair, overhaul, and procurement of ship propulsion and auxiliary equipment . . . . . E-9

MASTER CHIEF BOILERMAN (BTCM) - Continued

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BT

1.00 Practical Factors - Continued

- .96 Supervise inspections and surveys of equipment . . . . . E-9
- .97 Supervise and provide guidance to personnel regarding regulations and procedures for requisitioning, surveying, stowing, accounting, and preserving engineering department equipment . . . . . E-9
- .98 Assist in the preparation of general correspondence concerning fiscal, supply, and administrative matters . . . . . E-9
- .99 Assist in the management of records . . . . . E-9
- .991 Advise subordinate personnel of new developments and new technical information concerning the capabilities, limitations, and employment of propulsion equipment . . . . . E-9
- .992 Assist in the formulation of plans, policies, and budget requirements for the engineering department . . . . . E-9
- .993 Prepare examinations for enlisted personnel on technical aspects of BT rating . . . . . E-9

2.00 Examination Factors

None.

DAMAGE CONTROLMAN (DC)

GENERAL RATING

SCOPE

Damage Controlmen qualify in the techniques, skills, and use and maintenance of equipment for damage control, carpentry, firefighting, pipefitting, anchoring, welding, laying out, assembling, measuring, measuring devices, and nuclear, biological, and chemical (NBC) warfare defense; instruct and coordinate damage control parties; instruct and supervise personnel in techniques of NBC warfare defense, including the use of personnel decontamination stations and protective shelters; and are responsible for maintaining and repairing damage control equipment and for preserving watertight integrity.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for Advancement to DC

A. CARPENTRY AND WOODWORKING

1.00 Practical Factors

- .01 Use of tools and equipment for woodworking, including all hand-tools and machine tools found in the carpenter shop aboard ship or at depots and bases . . . . . E-4
- .02 Clean, adjust, and stow woodworking handtools found in the carpenter shop aboard ship or at depots and bases . . . . . E-4
- .03 Use of machine tools found in the carpenter shop aboard ship and ashore for woodworking . . . . . E-4
- .40 Repair wooden gangways and ladders; repair or replace linoleum, composition deck coverings and deck cleats; caulk seams, repair spars and make routine repairs to ship's boats . . . . . E-5
- .41 Demonstrate techniques employed in wood-finishing procedures . . . . . E-5
- .60 Plan and perform all woodworking jobs aboard ship, such as may be required for deck covering, gangways, boat hulls, and packing cases. . . E-6
- .61 Adjust, sharpen, and clean woodworking power tools found in the carpenter shop aboard ship or at depots and bases . . . . . E-6

2.00 Examination Factors

- .01 Characteristics of woods and glues used in woodworking . . . . . E-4
- .02 Types and uses of principal joints employed in woodworking . . . . . E-4
- .03 Use of power and hand tools . . . . . E-4

B. CARPENTRY AND WOODEN STRUCTURES

1.00 Practical Factors

- .01 Cut and join wooden members . . . . . E-4
- .02 Use and strip wooden and metal concrete forms . . . . . E-4
- .03 Perform assigned tasks in rough carpentry . . . . . E-4
- .60 Perform assigned tasks in roof construction and finished carpentry . . . E-6

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
DC

**B. CARPENTRY AND WOODEN STRUCTURES - Continued**

**1.00 Practical Factors - Continued**

- .61 Construct wooden forms with necessary bracing for concrete construction . . . . . E-6
- .62 Build and install interior and exterior finish carpentry in accordance with plans, sketches, instructions, and specifications. . . . . E-6
- .80 Perform assigned tasks in waterfront structures, bridges, and cofferdams . . . . . E-7

**2.00 Examination Factors**

- .01 Types and uses of lumber; normal and actual sizes of lumber and methods of computing board feet . . . . . E-4
- .02 Terminology for structural members of building and concrete forms . . . . . E-4
- .40 Layout of structural members in wooden structures and forms . . . . . E-5
- .41 Types and uses of piles; methods of driving piles . . . . . E-5
- .60 Types and characteristics of standard advance base prefabricated structures . . . . . E-6
- .61 Uses and methods of constructing cofferdams . . . . . E-6
- .62 Types of roofing and flooring materials and methods of application . . . . . E-6

**C. BLUEPRINTS AND DIAGRAMS**

**1.00 Practical Factors**

- .01 Read damage control diagrams to determine location of compartments and damage control fittings . . . . . E-4
- .40 Read blueprints and working drawings . . . . . E-5
- .60 Make working sketches and repair jobs . . . . . E-6

**2.00 Examination Factors**

- .60 Layout standards followed in diagramming firemain, main drain, plumbing drain, freshwater piping and air-conditioning systems of ships . . . . . E-6

**D. BOAT CONSTRUCTION**

**1.00 Practical Factors**

- .40 Make minor repairs to wooden and plastic boats . . . . . E-5

**2.00 Examination Factors**

- .01 Types of boats currently used in the Coast Guard . . . . . E-4
- .02 Nomenclature used in boat construction . . . . . E-4
- .40 Methods and materials used in boat construction . . . . . E-5
- .60 Procedures for renewing a stem, sternframe, and engine foundation in a small boat . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DC

E. PIPEFITTING

1.00 Practical Factors

- .01 Demonstrate knowledge in use of all pipefitting tools . . . . . E-4
- .02 Identify materials and fittings used in pipefitting . . . . . E-4
- .03 Demonstrate knowledge in cutting and threading pipe . . . . . E-4
- .40 Perform valve maintenance . . . . . E-5
- .60 Methods of installation and layout standards of all types of piping systems . . . . . E-6

2.00 Examination Factors

- .01 Use and care of all types of pipefitting tools . . . . . E-4
- .02 Identify pipe by size, material, and application . . . . . E-4
- .60 Layout piping systems . . . . . E-6
- .61 Procedures and methods used in valve maintenance . . . . . E-6
- .62 Methods and procedures of valve testing and inspecting . . . . . E-6

F. ANCHOR WINDLASSES AND ANCHORING EQUIPMENT

1.00 Practical Factors

- .01 Identify types and classes of anchor windlasses . . . . . E-4
- .02 Identify parts of anchor windlass and anchoring equipment . . . . . E-4
- .03 Perform routine maintenance of anchor windlass and equipment . . . . . E-4
- .04 Demonstrate familiarity of anchor detail procedures . . . . . E-4
- .40 Perform minor repairs and adjustments . . . . . E-5
- .41 Instruct other personnel in proper operation of windlass and anchor detail procedures . . . . . E-5
- .60 Perform major repairs, tests, and inspections of anchoring equipment . . . . . E-6
- .61 Take charge of anchor detail . . . . . E-6

2.00 Examination Factors

- .01 Types and classes of anchor windlasses . . . . . E-4
- .02 Nomenclature of windlass and equipment parts . . . . . E-4
- .03 Anchor detail procedures . . . . . E-4

G. FIREFIGHTING

1.00 Practical Factors

- .01 Use and maintain firefighting equipment, such as ladders, hose, adapters, nozzles, applicators, couplings, fireplugs and strainers, foam-injection apparatus, portable extinguishers, portable firepumps, protective clothing, oxygen breathing apparatus, and forcible-entry tools such as cutting torches, bolt cutters, and hacksaws . . . . . E-4
- .02 Operate permanently installed fire-extinguishing systems . . . . . E-4
- .03 Inspect and weigh CO<sub>2</sub> fire extinguishers . . . . . E-4
- .04 Make periodic and routine tests of firemain, sprinkler, and ventilation systems . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DC

G. FIREFIGHTING - Continued

1.00 Practical Factors - Continued

- .40 Make assigned periodic and routine tests of hatches, valves, watertight doors, and scuttles to ensure watertight integrity and safety from fire hazards . . . . . E-5
- .41 Use and service of dry chemical extinguishers and transfer equipment . . . . . E-5
- .42 Service, recharge, and repair fire extinguishers, foam-injection apparatus, and permanently installed fire extinguishing systems . . . . E-5

2.00 Examination Factors

- .01 Arrangement and sizes of hose; nozzle types, and their uses; and pressure required for proper operation of firefighting equipment . . . . E-4
- .02 Firemain system of own ship . . . . . E-4
- .03 Chemistry of fires and principles of extinguishment . . . . . E-4

H. PUMPS

1.00 Practical Factors

- .01 Operate firemain valves, all shipboard types of portable pumps and eductors (jet pumps) . . . . . E-4
- .02 Connect portable equipment in tandem to increase pumping capacity . . . E-4

2.00 Examination Factors

- .01 Various types of pumping equipment and their operation . . . . . E-4

I. PROTECTIVE MASKS AND GAS CYLINDERS

1.00 Practical Factors

- .40 Make assigned periodic inspections of protective masks and oxygen breathing apparatus . . . . . E-5
- .41 Service and repair protective masks and oxygen breathing apparatus . . . E-5

2.00 Examination Factors

- .01 Standard Coast Guard system used for marking gas cylinders . . . . . E-4
- .02 Fundamentals of operation and protection afforded by oxygen breathing apparatus and protective masks . . . . . E-4

J. COMPARTMENTS

1.00 Practical Factors

- .01 Take soundings of tanks, voids, and compartments . . . . . E-4
- .02 Make routine air tests of compartments . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DC

J. COMPARTMENTS - Continued

2.00 Examination Factors

- .01 Standard compartment numbering system . . . . . E-4

K. DAMAGE CONTROL

1.00 Practical Factors

- .01 Use, maintain, and stow tools and equipment for damage control, including power drills, airhammers, and tools of the shoring chest and repair locker . . . . . E-4
- .02 Renew gaskets, repack, and adjust dogs on watertight doors and hatches . . . . . E-4
- .03 Perform emergency shoring operations using wood and steel adjustable shores . . . . . E-4
- .04 Isolate damaged sections of firemain and restore pressure to balance of system . . . . . E-4
- .05 Use correct procedures for setting and maintaining material condition of readiness . . . . . E-4
- .06 Renew gaskets on ports and manholes . . . . . E-4
- .39 Demonstrate methods, techniques, and procedures for:
  - a. Rigging of jumpers . . . . . E-4
  - b. Construction of cofferdams . . . . . E-6
- .40 Use plastics in damage control repairs . . . . . E-5

2.00 Examination Factors

- .01 Basic objectives of shipboard damage control and systems . . . . . E-4
- .02 Principles and methods of bracing and shoring . . . . . E-4
- .03 Location of pumps, cross-connections and cutout valves of the damage control system . . . . . E-4
- .04 Principles and objectives of material condition of readiness and classification of fittings . . . . . E-4
- .40 Duties of damage control officer . . . . . E-5
- .41 Responsibility of other ratings for damage control work . . . . . E-5
- .42 Rigging and uses of casualty power systems . . . . . E-5

L. STABILITY PRINCIPLES

1.00 Practical Factors

None.

2.00 Examination Factors

- .80 Inspection of hull openings and principles of weight distribution while in drydock; and inspection of sea valves for leakage when flooding drydock . . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DC

M. NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) WARFARE DEFENSE

1.00 Practical Factors

- .01 Use, maintain, and stow NBC warfare protective equipment, including current-issue protective masks, clothing and self-aid equipment; adapt regular-issue clothing for NBC warfare protection . . . . . E-4
- .02 Demonstrate to others the procedures to be followed in removing protective equipment and showering at personnel decontamination stations after exposure to NBC warfare agents . . . . . E-4
- .03 Isolate areas with standard markers used to denote NBC warfare contamination . . . . . E-4
- .04 Perform duties of the various assignments, as a member of a decontamination or survey and monitoring party or as a member of a damage control repair party with duties in connection with decontamination . . . . . E-4
- .40 Determine extent of chemical contamination using currently approved detection devices . . . . . E-5
- .41 Operate alpha, beta, and gamma radiac survey meters . . . . . E-5
- .42 Perform required preoperative, postoperative, and weekly tests on radiac survey equipment . . . . . E-5
- .43 Maintain prescribed stock levels of NBC protective equipment . . . . . E-5
- .44 Make tests and assigned periodic inspections of decontamination equipment and material to assure serviceability of NBC warfare defense . . . . . E-5
- .45 Operate and inspect for correct operation all types of manual and automatic closure devices in ships and ashore for defensive action against NBC warfare attack . . . . . E-5
- .46 Describe or perform, as required, the radiological monitoring of personnel . . . . . E-5
- .47 Use available equipment in order to practice obtaining samples of biologically contaminated air, water, clothing, equipment, and surfaces for laboratory examination required by medical department . . . . . E-5
- .48 Decontaminate, under simulated conditions, personnel, clothing, ship's surfaces, and equipment exposed to NBC warfare agents . . . . . E-5
- .49 Make tests to ensure serviceability of protective masks and clothing used for protection against NBC warfare agents . . . . . E-5
- .60 Describe or perform, as required, perimeter (in and out approach and constant reading), area (preselected points and preselected dose rate), supplementary (equipment and material) methods of radiological monitoring and surveying . . . . . E-6
- .61 Supervise an NBC monitoring and/or decontamination team . . . . . E-6
- .62 Detect and identify chemical warfare agents . . . . . E-6
- .80 Organize and direct an NBC defense monitoring and decontamination party utilizing standard equipment and procedures . . . . . E-7

2.00 Examination Factors

- .01 Types and characteristics of standard nuclear blasts and nuclear radiation . . . . . E-4
- .02 Units of measure of nuclear radiation . . . . . E-4



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DC

M. NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) WARFARE  
DEFENSE - Continued

2.00 Examination Factors - Continued

- .03 Purpose and use of pocket dosimeters and film badges . . . . . E-4
- .40 Types, characteristics, and methods of dissemination of  
biological and chemical warfare agents . . . . . E-5
- .41 Procedures to be followed in preparation against attack as set forth  
in the disaster-control plan ashore . . . . . E-5
- .42 Damage control central procedures for recording information  
concerning extent and degree of contamination from NBC warfare agents. . E-5
- .43 Comparative shielding effect of earth, concrete, wood, lead,  
and steel . . . . . E-5
- .44 Maintenance of currently approved detection devices for biological  
and chemical warfare agents . . . . . E-5
- .45 Decontamination of shore areas, using mobile-powered decontamination  
equipment . . . . . E-5
- .60 Inspection and overhaul of NBC warfare protective equipment . . . . . E-6
- .61 Types, construction, and use of ventilated and unventilated  
protective shelters . . . . . E-6
- .62 Weather conditions, such as wind, temperature, and precipitation,  
affecting biological and chemical warfare attack . . . . . E-6
- .63 Procedure to be followed in preparation against NBC attack as set  
forth in the Nuclear, Biological, and Chemical Defense Bill  
aboard ship . . . . . E-6
- .64 Effects on personnel of thermal radiation as modified by weather,  
distance from blast and shelter . . . . . E-6

N. OXYGEN CUTTING, WELDING, AND ALLIED PROCESSES

1.00 Practical Factors

- .01 Operate portable a.c. welding transformer and d.c. welding generator,  
making appropriate current settings and electrode selections in  
accordance with BuShips specifications . . . . . E-4
- .02 Select proper size torch tips and adjust oxyacetylene equipment to  
produce carburizing, neutral, or oxidizing flames as required for  
welding, cutting, and brazing; select proper filler metal in  
accordance with BuShips specifications . . . . . E-4
- .03 Prepare steel cable for cutting and cut with an oxyacetylene  
cutting torch . . . . . E-4
- .04 Use prepared soft-soldering fluxes . . . . . E-4
- .05 Fill, light-off, operate, and secure a blowtorch . . . . . E-4
- .06 Perform the following types of weld:
  - a. Make a 1/4-inch fillet weld in arc welding mild steel material . . . E-4
  - b. Arc weld up to 1/4-inch thick mild steel material . . . . . E-4
  - c. Gas weld fittings to structural pipe . . . . . E-4
  - d. Torch braze fittings to pipe . . . . . E-4
- .07 Weld ship structures and fittings, using butt, lap, T-, corner,  
and edge joints . . . . . E-4
- .08 Use a soldering copper to solder a drip pan to withstand a visual  
and leakage test . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DC

N. OXYGEN CUTTING, WELDING, AND ALLIED PROCESSES - Continued

1.00 Practical Factors - Continued

- .09 Perform soft-soldering operations using torch and soldering copper . . . . . E-4
- .10 Pass the following welding and brazing tests: (See Performance Test Instructions)
  - a. Torch braze fittings to pipe and tubing . . . . . E-4
  - b. Arc weld up to 3/8-inch thick steel pipe or tubing . . . . . E-4
  - c. Make a 1/4-inch fillet weld in arc welding steel piping . . . . . E-4
- .40 Repair broken or defective castings using both arc and acetylene welding processes . . . . . E-5
- .41 Pass the following welding tests: (See Performance Test Instructions)
  - a. Make a 3/4-inch fillet weld in arc welding steel material . . . . . E-5
  - b. Arc weld up to 3/4-inch thick steel material . . . . . E-5
  - c. Torch braze . . . . . E-5
  - d. Gas weld up to 3/8-inch thick steel material . . . . . E-5
- .42 Pass the following welding and brazing tests: (See Performance Test Instructions)
  - a. Torch braze fittings to pipe and tubing . . . . . E-5
  - b. Arc weld up to 3/4-inch thick carbon steel pipe or tubing . . . . . E-5
  - c. Gas weld up to 3/8-inch thick steel pipe or tubing . . . . . E-5
  - d. Make a 1/4-inch fillet weld in arc welding steel piping or tubing. . . . . E-5
- .60 Surface valve seats, disks, and gates with hard facing alloys, monel, and bronze . . . . . E-6
- .61 Pass the following welding tests: (See Performance Test Instructions)
  - a. Torch braze fittings to pipe and tubing . . . . . E-6
  - b. Arc weld up to 3/8-inch thick copper-nickel pipe or tubing . . . . . E-6
  - c. Arc weld up to 3/8-inch thick chrome-moly alloy pipe or tubing . . . . . E-6
  - d. Arc weld up to 3/8-inch thick type 304 stainless steel plate . . . . . E-6
- .62 Inspect and approve conditions under which welding will be done . . . . . E-6

2.00 Examination Factors

- .01 Types, uses, and care of soldering coppers . . . . . E-4
- .02 Corrosive and non-corrosive classes of fluxes . . . . . E-4
- .03 Fluxes and materials used in making metallic splices . . . . . E-4
- .04 Operation of portable a.c. welding transformer and d.c. welding generator; method of making appropriate current settings and electrode selections in accordance with BuShips specifications . . . . . E-4
- .40 Methods of spacing, transferring heat, and controlling expansion and contraction of welds . . . . . E-5
- .41 Approved joints in welding ship structures and fittings . . . . . E-5

O. LAYING OUT, ASSEMBLING, INSTALLING, AND MAINTAINING

1.00 Practical Factors

- .01 Fabricate the following from sheet metal: funnels, 45° and 90° ells and tees . . . . . E-4
- .02 Layout and fit plate structures aboard ship and prepare plate for welding . . . . . E-4
- .40 Make a lift template for a bulkhead patch . . . . . E-5
- .41 Make temporary repairs to metal structures . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DC

O. LAYING OUT, ASSEMBLING, INSTALLING, AND MAINTAINING - Continued

1.00 Practical Factors - Continued

.42 Layout flanges (any number holes and sizes) in relation to pitch circle and pitch cord (outside and inside diameter) . . . . . E-5

2.00 Examination Factors

.01 Identify basic joints and tools used in sheet metal work . . . . . E-4  
 .40 Maintenance of heating and ventilation ducts . . . . . E-5  
 .41 Procedures and layout of sheet metal jobs . . . . . E-5

P. MEASURING AND MEASURING DEVICES

1.00 Practical Factors

.01 Use dividers, protractors, and inside-outside calipers and rulers . . . E-4  
 .02 Determine pitch of inside and outside threads, using a screw pitch gage or steel rule . . . . . E-4  
 .03 Determine size of wire and thickness of sheet metal, using a micrometer caliper, sheet metal gage, or wire gage . . . . . E-4  
 .04 Compute gallons of water in a given tank; convert fractions to thousandths . . . . . E-4  
 .40 Compute weight of piping and tubing . . . . . E-5

2.00 Examination Factors

.40 Weight computation of steel plates and sheet metal structures . . . . . E-5

Q. SAFETY

1.00 Practical Factors

.01 Demonstrate knowledge of safety precautions pertinent to own unit . . . E-4

2.00 Examination Factors

.39 Safety precautions involved in performing tasks appropriate to applicable rates as listed under all 1.00 Practical Factors of all subject headings.

R. RECORDS AND REPORTS

1.00 Practical Factors

.01 Maintain inventory of tools, equipment, and material . . . . . E-4  
 .40 Maintain compartment checkoff lists . . . . . E-5  
 .41 Prepare locally required records and reports, such as hull systems reports and reports on tests of damage control equipment; obtain replacements in equipment and supplies as required for: damage control and firefighting, carpentry, and NBC warfare defense . . . . . E-5

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
DC

**R. RECORDS AND REPORTS - Continued**

**2.00 Examination Factors**

- .01 Reports on tests of firefighting equipment . . . . . E-4
- .40 Records used in the issue and repair of NBC warfare defense  
equipment . . . . . E-5
- .41 Content, purpose, and correctness of compartment checkoff list . . . . . E-5
- .60 Methods for procuring NBC defense equipment . . . . . E-6

**S. ORGANIZATION AND SUPERVISION**

**1.00 Practical Factors**

- .39 Take charge of:
  - a. Ventilation system cleaning detail . . . . . E-4
  - b. Damage control repair party sub-group . . . . . E-5
- .60 Supervise and instruct personnel in techniques of firefighting  
and damage control, carpentry, and woodwork, and NBC warfare defense . . . . . E-6
- .61 Take charge of a damage control repair party . . . . . E-6
- .62 Demonstrate use of clothing impregnation sets and testing kits . . . . . E-6
- .63 Estimate time, materials, and manhours required to complete an  
emergency damage repair job and woodwork repair job . . . . . E-6
- .64 Take charge of decontamination or survey and monitoring party . . . . . E-6
- .79 Organize and supervise:
  - a. Damage control and firefighting parties . . . . . E-6
  - b. Carpenter shop . . . . . E-7
- .80 Instruct personnel in use, effectiveness, and limitations of  
protective masks . . . . . E-7

**2.00 Examination Factors**

- .60 Firefighting and fire prevention:
  - a. Organization of a fire party; deployment of men and equipment . . . . . E-6
  - b. Stability considerations on firefighting . . . . . E-6
  - c. Fire hazards and fire prevention . . . . . E-6
- .61 Organization, equipment, and personnel required for establishment  
of a personnel decontamination station . . . . . E-6

**T. ADMINISTRATION**

**1.00 Practical Factors**

- .01 Locate and use appropriate sections of BuShips Technical Manual,  
manufacturers' technical manuals, mechanical drawings, and handbooks  
to obtain data for making repairs . . . . . E-4
- .60 Supervise stowage of, preservation of, and accounting for wood-  
working and damage control equipment . . . . . E-6
- .80 Keep shops records and prepare shipyard and base work requests . . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DC

T. ADMINISTRATION - Continued

2.00 Examination Factors

- .01 Navy manuals used as a source of technical information when making repairs . . . . . E-4
- .60 Procedures for obtaining replacement parts and supplies . . . . . E-6
- .61 Uses of allowance lists for repair parts, tools, and supplies . . . . . E-6
- .80 Work requests, job orders, progress reports, and other records kept by the repair department . . . . . E-7

★ SENIOR CHIEF DAMAGE CONTROLMAN (DCCS)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .90 Train and supervise personnel in damage control procedures, including material conditions of readiness and the use, maintenance, and repair of damage control and firefighting equipment . . . . . E-8
- .91 Train and supervise personnel in the shipboard aspects of NBC defense and personnel protection . . . . . E-8
- .92 Organize and direct monitoring, decontamination, and damage control parties . . . . . E-8
- .93 Train and supervise personnel in fabrication, installation, repair, and maintenance of piping and ventilation systems . . . . . E-8
- .94 Train and supervise personnel in welding and cutting, woodworking, and making small boat and hull repairs . . . . . E-8
- .941 Assist in planning projects to be accomplished by the engineering department during availabilities and supervise scheduled work . . . . . E-8
- .942 Train and supervise enlisted personnel in maintaining engineering and hull records, and in preparing reports . . . . . E-8
- .943 Prepare technical lesson plans on the maintenance and operation of damage control equipment and systems, and non-technical lesson plans on training and administration . . . . . E-8

2.00 Examination Factors

- .90 Theoretical Damage Control, Section I, Chapter 88 of NavShips Technical Manual . . . . . E-8
- .91 Practical Damage Control, Section II, Chapter 88 of NavShips Technical Manual . . . . . E-8
- .93 Shipboard aspects of NBC defense . . . . . E-8
- .94 Firefighting, Chapter 93 of the NavShips Technical Manual . . . . . E-8

★ MASTER CHIEF DAMAGE CONTROLMAN (DCCM)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DC

1.00 Practical Factors

- .95 Assist engineering in the management of Coast Guard repair facilities, including carpenter shops, welding shops, blacksmith shops, sheet metal shops, pipe fitting shops, and small boat repair facilities . . . . . E-9
- .96 Advise the Damage Control Assistant of new developments and new technical information concerning the capabilities, limitations, and employment of damage control and NBC equipment . . . . . E-9
- .97 Establish, review, and maintain emergency shipboard bills under the cognizance of the Damage Control Assistant . . . . . E-9
- .98 Assist and advise the Damage Control Assistant in planning damage control programs and in conducting damage control tests and inspections . . . . . E-9
- .99 Assist in the preparation of general correspondence concerning fiscal, supply, and administrative matters . . . . . E-9
- .991 Prepare examinations for enlisted personnel on the technical aspects of the DC rating . . . . . E-9

2.00 Examination Factors

None.

ELECTRICIAN'S MATE (EM)

GENERAL RATING

SCOPE

Electrician's Mates stand watch on motors, generators, switchboards and control equipment; operate electrical equipment; maintain and repair power and lighting circuits, electrical fixtures, motors, generators, distribution switchboards, and other electrical equipment; test for short circuits, grounds or other casualties; and repair and rebuild electrical equipment in an electrical shop.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EM

A. FUNDAMENTALS OF ELECTRICITY AND ELECTRONICS

1.00 Practical Factors

- .01 Draw and interpret schematic diagrams of electrical circuits; read, interpret and work from electrical wiring and circuit diagrams found in equipment instruction books . . . . . E-4
- .02 Operate the following standard test equipment used in servicing electrical and electronic equipment:
  - a. Voltmeter . . . . . E-4
  - b. Ammeter . . . . . E-4
  - c. Ohmmeter . . . . . E-4
  - d. Multimeter . . . . . E-4
  - e. Megger . . . . . E-4
  - f. Frequency meter . . . . . E-4
  - g. Phase-sequence indicator . . . . . E-4
  - h. Power-factor meter . . . . . E-4
  - i. Synroscope . . . . . E-4
  - j. Thermocouple instrument . . . . . E-4
  - k. Instrument transformer . . . . . E-4
  - l. Wattmeter . . . . . E-4
  - m. Stroboscopic tachometer . . . . . E-4
  - n. Clamp-on-ammeter . . . . . E-4
  - o. Oscilloscope . . . . . E-4
  - p. Wheatstone bridge . . . . . E-4
  - q. Tube tester . . . . . E-4
- .40 Test internal circuits of major units of electrical equipment for continuity, short circuits and grounds; measure electrical quantities such as voltage, current and power and compare with established values; use an oscilloscope to view circuit waveforms and compare with established optimum-performance waveforms required in electrical equipment . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EM

A. FUNDAMENTALS OF ELECTRICITY AND ELECTRONICS - Continued

2.00 Examination Factors

.01	Methods and equipment used in electrical tests for continuity, grounds and short circuits . . . . .	E-4
.02	Meaning of:	
	a. Conductors and insulators, lines-of-force, field intensity, flux density, permeability, ampere-turns, hysteresis and eddy currents, self- and mutual-induction, and electromagnetic induction. . . . .	E-4
	b. Coulomb, volt, ampere, ohm, henry, circular mil, farad and watt. . . . .	E-4
	c. Horsepower, power factor and volt-ampere . . . . .	E-4
	d. Reactance, capacitance, inductance and impedance . . . . .	E-4
	e. Torque, frequency, cycle, phase and pulse. . . . .	E-4
	f. Ambient temperature. . . . .	E-4
	g. Ampere-hour. . . . .	E-4
	h. Milli, micro, kilo and mega as applied to any of the above units of measure. . . . .	E-4
.03	Electric installation identification:	
	a. Classification of circuits . . . . .	E-4
	b. Cable marking. . . . .	E-4
	c. Equipment marking. . . . .	E-4
	d. Panel marking. . . . .	E-4
	e. Switch marking . . . . .	E-4
	f. Phase and polarity marking . . . . .	E-4
.04	Types of insulating materials and varnishes. . . . .	E-4
.05	Relationship of resistance, inductance and capacitance in a.c. circuits. . . . .	E-4
.06	Relationship of current, voltage, and impedance in a.c. circuits, including resonant circuits. . . . .	E-4
.07	Operating principles of electron tubes in:	
	a. Amplifiers . . . . .	E-4
	b. Power supplies . . . . .	E-4
.08	Calculate current, voltage, power and resistance in d.c. series and parallel circuits. . . . .	E-4
.09	Calculate current, voltage, power, phase angle, impedance and resonance in a.c. series and parallel circuits . . . . .	E-4
.10	Function of the following in electrical circuits:	
	a. Resistors. . . . .	E-4
	b. Rheostats and potentiometers . . . . .	E-4
	c. Solenoids. . . . .	E-4
	d. Inductors. . . . .	E-4
	e. Capacitors . . . . .	E-4
	f. Fuses. . . . .	E-4
	g. Switches . . . . .	E-4
	h. Reactors . . . . .	E-4
	i. Transformers . . . . .	E-4
	j. Relays . . . . .	E-4
	k. Rectifiers . . . . .	E-4
	l. Saturable reactors . . . . .	E-4



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EM

A. FUNDAMENTALS OF ELECTRICITY AND ELECTRONICS - Continued

2.00 Examination Factors - Continued

- .39 Operating principles and construction of the following:
  - a. Storage batteries . . . . . E-4
  - b. Circuit breakers. . . . . E-4
  - c. Generators and alternators. . . . . E-4
  - d. Shunt motors (d.c.) . . . . . E-4
  - e. Series motors (d.c.) . . . . . E-4
  - f. Compound motors (d.c.) . . . . . E-4
  - g. Stabilized shunt motors (d.c.) . . . . . E-4
  - h. Controllers (d.c. and a.c.) . . . . . E-4
  - i. Transformers. . . . . E-4
  - j. Single-phase motors . . . . . E-4
  - k. Induction motors. . . . . E-4
  - l. Synchronous motors. . . . . E-4
  - m. Electric brakes . . . . . E-4
  - n. Automatic voltage regulators (a.c. and d.c.) . . . . . E-5
  - o. Rotary amplifier-type motor generators. . . . . E-6
  - p. Magnetic amplifiers . . . . . E-6

B. CIRCUITS, WIRING AND CABLES

1.00 Practical Factors

- .01 Locate blown fuses, using a voltage tester, and replace with fuses of proper ratings, using fuse pullers . . . . . E-4
- .02 Solder electrical connections and splices . . . . . E-4
- .03 Detect and locate grounds, open circuits and short circuits in lighting circuits. . . . . E-4
- .04 Isolate individual circuits in electrical distribution system . . . . . E-4
- .05 Select correct types and sizes of wire and insulation . . . . . E-4
- .39 On circuit breakers:
  - a. Lubricate bearing point and bearing surfaces, including latches . . . . . E-4
  - b. Clean all surfaces including insulation surfaces, with a dry cloth, blower or vacuum cleaner, using approved methods . . . . . E-4
  - c. Inspect the sealing surfaces of contactor and relay armatures and pole faces to see that they are clean, free from rust and seated properly . . . . . E-4
  - d. Check and replace pins, bearings, latches and contact and mechanism springs where excessive wear, corrosion or over-heating is evidenced. . . . . E-5
  - e. Inspect trip shafts, toggle linkages, and all other mechanical parts to see that they operate freely and without binding . . . . . E-5
  - f. Inspect mechanical and electrical connections, including mounting bolts and screws; draw out disconnect devices and control wiring. . . . . E-5
- .40 Detect and locate grounds, open circuits and short circuits in degaussing systems . . . . . E-5
- .41 Maintain and repair telephones, circuits and associated equipment . . . . . E-5
- .60 Remove, test and replace defective components in automatic-degaussing control panels . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EM

B. CIRCUITS, WIRING AND CABLES - Continued

2.00 Examination Factors

- .01 Relationship of resistance, temperature, size and current in an electrical conductor . . . . . E-4
- .02 Relationship of reluctance, flux and magnetomotive force in a.c. and d.c. magnetic circuits. . . . . E-4
- .03 Construction and types of shipboard electric cable . . . . . E-4
- .40 Relationship of current and voltage in wye, delta wye, and V (open delta) connections. . . . . E-5
- .41 Procedures for testing electrical safety devices for proper operation. . . . . E-5

C. MOTORS AND GENERATORS

1.00 Practical Factors

- .01 Examine running motors and generators for cleanliness, vibration, unusual or excessive noise, heating, lubricant leakage and condition of brushes, commutators, collector rings, bearings and bolts . . . . . E-4
- .02 Detect and locate grounds, open circuits and short circuits in a.c. and d.c. motors and motor controllers. . . . . E-4
- .03 Clean and lubricate electric motors and motor-generator sets . . . . . E-4
- .04 Remove from the line and secure:
  - a. A single a.c. generator connected alone to a bus . . . . . E-4
  - b. A single d.c. generator connected alone to a bus . . . . . E-4
  - c. A d.c. generator which has been operating in parallel with another generator. . . . . E-4
  - d. An a.c. generator which has been operating in parallel with another generator. . . . . E-4
- .05 Start and put on the line:
  - a. D.c. generators for parallel operation . . . . . E-4
  - b. A d.c. generator to its bus for nonparallel operation. . . . . E-4
- .06 Synchronize a.c. generators for parallel operation . . . . . E-4
- .07 Set up emergency diesel generator for automatic operation. . . . . E-4
- .39 Inspect and correct deficiencies in:
  - a. Brush pigtails . . . . . E-4
  - b. Brush alinement and distance . . . . . E-4
  - c. Brush holders. . . . . E-4
  - d. Brush pressure . . . . . E-4
  - e. Commutators. . . . . E-5
  - f. Collector rings. . . . . E-5
- .40 Under cut armature commutators . . . . . E-5
- .41 Rewind controller solenoids. . . . . E-5
- .42 Measure insulation resistance of alternators, generators and exciters. . . . . E-5
- .43 Operate and maintain a.c. and d.c. ship propulsion equipment . . . . . E-5
- .60 Detect and locate grounds, open circuits and short circuits in ship's service and emergency generators and associated switch gear. . . . . E-6
- .61 Inspect and test-operate automatic starting equipment of emergency generators . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EM

C. MOTORS AND GENERATORS - Continued

1.00 Practical Factors - Continued

- .62 Rewind a.c. and d.c. motors. . . . . E-6
- .63 Bench-test controllers and insert new contact points; and repair bakelite panels. . . . . E-6
- .80 Inspect, test and adjust voltage regulators. . . . . E-7

2.00 Examination Factors

- .01 Procedures for replacing bearings. . . . . E-4
- .02 Common operational faults of a.c. and d.c. motors, generators and synchro's. . . . . E-4
- .03 Procedures to be followed when starting, paralleling generators and switchboards, splitting plant, or securing generators. . . . . E-4
- .04 Procedures for flushing bearing housings of grease and oil from lubricated motors. . . . . E-4
- .05 Applications of the laws of magnetism to d.c. motors and generators. . . . . E-4
- .06 Electrical and physical characteristics of electric motors, generators, dynamotors and synchro's . . . . . E-4
- .07 Procedures to be followed when cleaning electrical equipment with appropriate approved cleaning solvents . . . . . E-4
- .40 Procedures for checking controllers for proper operation . . . . . E-5

D. BATTERIES, ELECTRIC APPLIANCES, INSTRUMENTS AND FIXTURES

1.00 Practical Factors

- .01 Replace portable storage and dry cell batteries. . . . . E-4
- .02 Replace worn gaskets and seals of watertight electrical fixtures . . . . . E-4
- .03 Repair portable electric tools, portable lights, fans and appliances by:
  - a. Testing component parts with an ohmmeter or megger for grounds, open circuits and short circuits. . . . . E-4
  - b. Cleaning electric contacts and windings or elements . . . . . E-4
  - c. Replacing defective cords, plugs, switches, elements and worn brushes . . . . . E-4
- .04 Maintain the following electrical systems on ship's boats:
  - a. Ignition (gasoline engine) . . . . . E-4
  - b. Starting heater circuit (diesel engine). . . . . E-4
  - c. Lighting . . . . . E-4
  - d. Starter. . . . . E-4
  - e. Generator and alternators. . . . . E-4
  - f. Voltage regulator. . . . . E-4
  - g. Batteries. . . . . E-4
- .05 Conduct test discharge and various types of charges on portable storage batteries. . . . . E-4
- .06 Place new storage batteries (in dry state) in service. . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EM

D. BATTERIES, ELECTRIC APPLIANCES, INSTRUMENTS AND FIXTURES - Continued

1.00 Practical Factors - Continued

- .39 Service electric range and oven by:
  - a. Taking resistance and circuit readings . . . . . E-4
  - b. Cleaning control panels and relays . . . . . E-4
  - c. Replacing defective heating units, thermostats, and control of unit wiring. . . . . E-5
- .40 Mix electrolyte for storage batteries. . . . . E-5
- .41 Replace or repair defective lugs, connectors, separators, cell covers or complete cell units of storage batteries . . . . . E-5
- .42 Rewind coils:
  - a. Take and record necessary data . . . . . E-5
  - b. Set up and operate coil-winding equipment. . . . . E-5
  - c. Tape and insulate coils. . . . . E-5
  - d. Reassemble and bench test. . . . . E-5
- .43 Maintain IC room and associated equipment. . . . . E-5
- .60 Determine type and process of initial, normal, equalizing, floating and emergency charge needed by portable storage batteries. . . . . E-6

2.00 Examination Factors

None.

E. POWER AND LIGHTING EQUIPMENT

1.00 Practical Factors

- .01 Operate, inspect, adjust, clean, lubricate and repair signal lights and searchlights . . . . . E-4
- .02 Test running, anchor and signal lights, and replace lamps. . . . . E-4
- .03 Provide emergency power to main distribution board from emergency switchboard through feedback switch. . . . . E-4
- .04 Replace power and lighting cable aboard ship . . . . . E-4
- .05 Detect and locate grounds, open circuits and short circuits in power distribution cables. . . . . E-4
- .40 Operate manual and automatic degaussing equipment. . . . . E-5
- .41 Install new power and lighting circuits. . . . . E-5
- .60 Connect shore power to main distribution board . . . . . E-6
- .61 Test, remove and install instrument transformers and meters on power and lighting switchboards and control panels . . . . . E-6
- .80 Test, inspect and direct repairs of power and lighting equipment . . . . E-7
- .81 Supervise and train personnel in operation, maintenance, repair and safety precautions pertaining to power and lighting equipment. . . . . E-7
- .82 Estimate time and material needed for repair of power and lighting electrical equipment . . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EM

E. POWER AND LIGHTING EQUIPMENT - Continued

2.00 Examination Factors

- .01 Procedures for connecting casualty powerlines. . . . . E-4
- .02 Procedures for test operation of automatic bus transfer switches . . . . E-4
- .40 Procedures for disconnecting and removal of instrument transformers  
and meters from switchboards . . . . . E-5
- .41 Normal, alternate and emergency power-distribution systems for shipboard  
lighting and power distribution. . . . . E-5
- .42 Maintenance and repair of searchlights . . . . . E-5

F. WATCHSTANDING

1.00 Practical Factors

- .01 Stand watch of d.c. ship's service generator and distribution switch-  
board:
  - a. Visually scan the various switchboard meters and indicators to  
determine whether generator is operating properly. . . . . E-4
  - b. Take and log readings. . . . . E-4
  - c. Adjust field rheostat to maintain normal voltage . . . . . E-4
  - d. Maintain load distribution when machines are operated in parallel. . . E-4
- .02 Man electrical watch at the following stations:
  - a. Steering engine room. . . . . E-4
  - b. Anchor windlass. . . . . E-4
  - c. Hoist equipment and/or elevator. . . . . E-4
  - d. Degaussing switchboard . . . . . E-4
  - e. Emergency switchboard. . . . . E-4
- .03 Stand watch on an a.c. ship's service generator and distribution  
switchboard:
  - a. Visually scan the various switchboard meters and indicators to  
determine whether the proper load is being carried and the  
generator is operating properly. . . . . E-4
  - b. Take and log readings. . . . . E-4
  - c. Shift to standby automatic voltage regulator . . . . . E-4
  - d. Control voltage manually during emergency conditions . . . . . E-4
  - e. Maintain normal voltage. . . . . E-4
  - f. Maintain normal frequency. . . . . E-4
  - g. Set up distribution board for general quarters condition . . . . . E-4
- .04 Stand watch on auxiliary boilers and equipment . . . . . E-4
- .40 Stand watch on main propulsion-control switchboard . . . . . E-5
- .41 Stand gyrocompass watch and be capable of starting, stopping and  
performing minor adjustments . . . . . E-5
- .60 Stand watch on main propulsion machinery on board ship, including  
lining up systems, starting, operating and securing machinery. . . . . E-6
- .80 Take complete charge of engine room on large vessel or the engineering  
department on a small vessel or shore station. . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EM

F. WATCHSTANDING - Continued

2.00 Examination Factors

- .01 Procedures for operating steering equipment in pilothouse and steering engine room . . . . . E-4
- .02 Layout of steering installation . . . . . E-4
- .03 Operating principles of steering synchro transmitters and receivers . . . . . E-4
- .60 Procedures for normal and casualty operation of main propulsion switchboard . . . . . E-6
- .61 Inspections to be made on ship's service and emergency switchboard equipment when power is secured . . . . . E-6
- .62 Principles of the gyrocompass . . . . . E-6

G. SAFETY

1.00 Practical Factors

- .40 Demonstrate ability to isolate equipment for repairs, including such safety precautions as tagging switches, removing fuses, grounding test equipment and use of shorting bars . . . . . E-5
- .80 Conduct electrical emergency drills . . . . . E-7

2.00 Examination Factors

- .01 Precautions to be observed when removing paint from, or repainting electrical equipment . . . . . E-4
- .02 Precautions to be observed when cleaning electrical equipment with appropriate approved cleaning solvents . . . . . E-4
- .80 Application of damage-control principles as applied by electrician's mates . . . . . E-7

H. ADMINISTRATION

1.00 Practical Factors

- .01 Locate and use:
  - a. BUSHIPS Technical Manual . . . . . E-4
  - b. Applicable directives . . . . . E-4
  - c. Manufacturer's Instruction Books . . . . . E-4
  - d. Blueprints . . . . . E-4
  - e. Ships Allowance Book . . . . . E-4
  - f. Machinery Index . . . . . E-4
  - g. Current supply catalog systems . . . . . E-4
- .40 Use appropriate sections of BuShips Technical Manual, manufacturers' technical manuals and ship's information book in repairing electrical equipment . . . . . E-5
- .41 Locate and use records and reports required by the engineering department . . . . . E-5
- .42 Prepare quarterly requisition requirements for engineering department . . . . . E-5
- .60 Prepare reports and records required by the engineering department . . . . . E-6
- .61 Prepare availability work requests and schedules . . . . . E-6
- .80 Prepare reports on power and lighting equipment failures . . . . . E-7
- .81 Check electrical operating logs and maintenance records to determine if equipment is operating properly . . . . . E-7
- .82 Estimate time, materials, and labor required for repair of electrical systems and equipment . . . . . E-7
- .83 Conduct a training program in operation, maintenance and repair of electrical equipment . . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EM

H. ADMINISTRATION - Continued

2.00 Examination Factors

- .40 Procedures for obtaining replacement parts and supplies; maintenance of inventory . . . . . E-5
- .60 Schedules of routine maintenance, tests, and inspections . . . . . E-6
- .80 Administrative, material, and operational readiness inspections . . . . . E-7
- .81 Reports covering power and lighting equipment failures . . . . . E-7

★ SENIOR CHIEF ELECTRICIAN'S MATE (EMCS)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .90 Provide to the engineer technical information and advice concerning capabilities, limitations, reliability, and operation of electrical systems and associated equipment . . . . . E-8
- .91 Direct operation and control of electrical distribution and interior communication systems and circuits . . . . . E-8
- .92 Plan emergency drills for engineering personnel . . . . . E-8
- .93 Plan, organize, and direct work of personnel operating and maintaining electrical systems . . . . . E-8
- .94 Assist in planning projects to be accomplished by the engineering department during availabilities and supervise scheduled work . . . . . E-8
- .941 Train subordinate personnel in the procedures for preparing engineering reports and base or shipyard work requests and for maintaining engineering records . . . . . E-8
- .942 Prepare technical lesson plans on the maintenance and operation of electrical equipment and systems, and non-technical lesson plans on training and administration . . . . . E-8

2.00 Examination Factors

- .90 Capabilities, limitations, and functions of electrical systems and related equipment . . . . . E-8
- .91 Operation, maintenance, and repair of power and lighting distribution systems . . . . . E-8
- .92 Preparation of check-off lists, work requests, and engineering records . . . . . E-8

★ MASTER CHIEF ELECTRICIAN'S MATE (EMCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Supervise personnel in the operation, maintenance, overhaul, procurement, and survey of electrical equipment . . . . . E-9

MASTER CHIEF ELECTRICIAN'S MATE (EMCM) - Continued

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EM

1.00 Practical Factors - Continued

- .96 Collect, prepare, and disseminate technical information pertaining to test, maintenance, and repair of electrical and IC equipment and associated systems . . . . . E-9
- .97 Prepare general correspondence concerning fiscal, supply, and administrative matters . . . . . E-9
- .98 Assist in the management of engineering records . . . . . E-9
- .99 Assist in the formulation of plans, policies, and budget requirements for the engineering department . . . . . E-9
- .991 Prepare examinations for enlisted personnel in the technical aspects of the EM rating . . . . . E-9

2.00 Examination Factors

None.



# ENGINEMAN (EN)

## GENERAL RATING

### SCOPE

Enginemen operate, maintain and repair internal-combustion engines; operate and maintain auxiliary engineroom, refrigeration and air-conditioning equipment; and operate and maintain electrical equipment.

### SERVICE RATINGS

None.

### QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EN

#### A. INTERNAL-COMBUSTION ENGINES

##### 1.00 Practical Factors

- |     |  |     |
|-----|--|-----|
| .01 | Clean strainers and change filters on diesel and gasoline engines . . . . .  | E-4 |
| .02 | Purge diesel-engine fuel injection system . . . . .  | E-4 |
| .40 | Inspect, adjust and test run diesel and gasoline engines. . . . .  | E-5 |
| .41 | Remove, inspect, repair or renew as required, and reinstall:   |     |
|     | a. Liners. . . . .   | E-5 |
|     | b. Pistons . . . . .   | E-5 |
|     | c. Cylinder heads. . . . .   | E-5 |
|     | d. Wrist pins. . . . .   | E-5 |
|     | e. Piston rings. . . . .   | E-5 |
|     | f. Bearings. . . . .   | E-5 |
| .42 | Reface and reseal intake and exhaust valves . . . . .  | E-5 |
| .43 | Test unit injectors and/or fuel-injection nozzles . . . . .  | E-5 |
| .60 | Dissassemble, clean, repair and assemble, and replace fuel oil injection valves. . . . .   | E-6 |
| .61 | Take clearances on blower lobes and blower timing and drive gears . . .  | E-6 |
| .62 | Take main engine bearing and thrust clearances. . . . .  | E-6 |
| .63 | Overhaul and/or repair internal-combustion engines, using appropriate checkoff lists and repair guides. . . . .                      | E-6 |
| .64 | Inspect and adjust hydraulic and mechanical governors, hydraulic and mechanical overspeed trips, and loadlimiting governors. . . . . | E-6 |
| .80 | Conduct operational tests and make adjustments required upon completion of an engine overhaul. . . . .                               | E-7 |

##### 2.00 Examination Division

- |     |  |     |
|-----|--|-----|
| .01 | Meaning and significance of:                             |     |
|     | a. Compression ignition principle. . . . .               | E-4 |
|     | b. Scavenging. . . . .                                   | E-4 |
|     | c. Turbulence. . . . .                                   | E-4 |
|     | d. Turbulence chambers . . . . .                         | E-4 |
|     | e. Supercharging . . . . .                               | E-4 |
|     | f. Basic theory of internal-combustion engines . . . . . | E-4 |

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EN

A. INTERNAL-COMBUSTION ENGINES - Continued

2.00 Examination Factors - Continued

	g. True diesel cycle . . . . .	E-4
	h. Semidiesel cycle . . . . .	E-4
	i. Otto cycle. . . . .	E-4
	j. Sections and stages of gas turbines . . . . .	E-4
.02	Principles and operation of the following:	
	a. Four-stroke cycle engine. . . . .	E-4
	b. Two-stroke cycle engine . . . . .	E-4
	c. Opposed-piston engine . . . . .	E-4
	d. Single-acting engine. . . . .	E-4
	e. Gas-turbine engine. . . . .	E-4
	f. Governors . . . . .	E-4
.03	Causes and prevention of crankcase explosions . . . . .	E-4
.04	Procedures to be followed when the following symptoms appear in diesel engines:	
	a. Hunting . . . . .	E-4
	b. Failure to start. . . . .	E-4
	c. Contamination of fuel oil, lubricating oil and cooling water. . . . .	E-4
	d. Engine will not turn over . . . . .	E-4
	e. Low- or high-firing pressure. . . . .	E-4
	f. Loss of lubricating oil pressure. . . . .	E-4
	g. Low-scavenging air receiver pressure. . . . .	E-4
	h. High-exhaust back pressure. . . . .	E-4
	i. Excessive smoke . . . . .	E-4
	j. High cylinder temperature . . . . .	E-4
	k. Low cylinder temperature. . . . .	E-4
	l. Excessive vibration . . . . .	E-4
	m. Overspeed device fails to operate . . . . .	E-4
.05	Types, purpose and operating principles of exhaust silencers. . . . .	E-4
.06	Principles and use of compression, oil-control and oilscraper piston rings. . . . .	E-4
.07	Operating principles of the following gasoline-engine units:	
	a. Distributors. . . . .	E-4
	b. Flywheels . . . . .	E-4
	c. Starting motors . . . . .	E-4
	d. Fuel pumps. . . . .	E-4
	e. Carburetors . . . . .	E-4
	f. Spark plugs . . . . .	E-4
	g. Generators. . . . .	E-4
	h. Ignition coils. . . . .	E-4
	i. Batteries . . . . .	E-4
	j. Lubricating-oil pumps . . . . .	E-4
	k. Water pumps . . . . .	E-4
	l. Voltage regulators. . . . .	E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EN

A. INTERNAL-COMBUSTION ENGINES - Continued

2.00 Examination Factors - Continued

- .08 Procedures to be followed when the following symptoms appear in gasoline engines:
  - a. Hunting. . . . . E-4
  - b. Engine misses. . . . . E-4
  - c. Engine fails to start. . . . . E-4
  - d. Engine will not turn over. . . . . E-4
  - e. Engine in operation suddenly stops . . . . . E-4
  - f. Unusual noises in engine . . . . . E-4
  - g. Engine runs with ignition off. . . . . E-4
  - h. Engine starts but will not run continuously. . . . . E-4
  - i. Engine runs unevenly . . . . . E-4
- .40 Principles and operation of diesel-engine fuel-injection systems . . . . . E-5
- .41 Purpose and operating principles of diesel-driven generator. . . . . E-5
- .42 Purpose and operating principles of governors and overspeed trips. . . . . E-5
- .60 Factors governing main propulsion plant efficiency; causes of poor performance and appropriate remedies . . . . . E-6
- .61 Causes and prevention of:
  - a. Excessive and undue piston wear. . . . . E-6
  - b. Cracked piston . . . . . E-6
  - c. Broken lands . . . . . E-6
  - d. Piston-skirt seizure . . . . . E-6
  - e. Excessive ring-groove clearance. . . . . E-6
  - f. Worn piston-pin bushing. . . . . E-6
  - g. Loose connecting-rod bearings. . . . . E-6
  - h. Misaligned connecting rods. . . . . E-6
  - i. Out-of-round cylinder bore . . . . . E-6
  - j. Scored journals. . . . . E-6
  - k. Journal-bearing failures . . . . . E-6
  - l. Damaged shaft or thrust bearings . . . . . E-6

B. DIESEL-ENGINE STARTING SYSTEMS

1.00 Practical Factors

- .01 Start, operate and secure diesel engines . . . . . E-4
- .02 Engage and disengage jacking gear on diesel engines. . . . . E-4
- .03 Turn main engines. . . . . E-4
- .40 Start, place on the board and parallel two AC generators, change the electrical load from one generator to the other. . . . . E-5

2.00 Examination Factors

- .01 Purpose and operating principles of:
  - a. Air-starting systems . . . . . E-4
  - b. Electric-starting systems. . . . . E-4
  - c. Jacking gears. . . . . E-4
  - d. Hydraulic-starting systems . . . . . E-4
- .60 Emergency procedures in starting and stopping diesel engines . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EN

C. COOLING AND LUBRICATING SYSTEMS

1.00 Practical Factors

- .01 Line up lubricating oil system. . . . . E-4
- .02 Circulate lubricating oil through engine with standby lubricating-oil pump. . . . . E-4
- .03 Line up, start, operate and secure lubricating- and fuel-oil centrifuges . . . . . E-4
- .04 Take proper action in the event of abnormal lubricating-oil pressure or temperatures. . . . . E-4
- .05 Raise temperature of lubricating oil in settling tank to specified temperature and secure heating coils. . . . . E-4
- .06 Change oil in diesel engines. . . . . E-4
- .07 Lubricate pumps and compressors . . . . . E-4
- .08 Replace zincs in all salt-water cooling systems . . . . . E-4
- .09 Lubricate diesel-electric generating equipment. . . . . E-4
- .40 Treat chemically and conduct sodium dichromate, alkalinity and chloride tests on internal-combustion engines' closed cooling system. . . . . E-5
- .41 Clean, inspect and test heat exchangers . . . . . E-5

2.00 Examination Factors

- .01 Path of lubricating oil through an internal-combustion engine . . . . . E-4
- .02 Path of cooling water through an internal-combustion engine (open and closed systems) . . . . . E-4
- .03 Purpose and operating principles of lubricating-oil purifiers . . . . . E-4
- .04 Purpose and operating principles of air coolers . . . . . E-4
- .05 Operating principles of the following engine-lubricating systems:
  - a. Shunt . . . . . E-4
  - b. Sump. . . . . E-4
  - c. Bypass. . . . . E-4
  - d. Full-flow . . . . . E-4
- .40 Causes and prevention of:
  - a. Clogged oil holes . . . . . E-5
  - b. Too high lubricating-oil temperature. . . . . E-5
  - c. Lubricating-oil line leakage. . . . . E-5
  - d. Water jacket corrosion. . . . . E-5

D. FUEL AND LUBRICANTS

1.00 Practical Factors

- .01 Line up fuel oil systems for receiving or transferring or ballasting fuel oil tanks. Man any station during fueling operations. . . . . E-4
- .40 Conduct dilution, neutralization and precipitation tests on lubricating oil . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EN

D. FUEL AND LUBRICANTS - Continued

2.00 Examination Factors

- .01 Types of lubricating oil required for internal-combustion engines . . . E-4
- .02 Purpose and importance of:
  - a. Firepoint . . . . . E-4
  - b. Flashpoint. . . . . E-4
  - c. Pourpoint . . . . . E-4
  - d. Carbon residue. . . . . E-4
  - e. Neutralization number . . . . . E-4
  - f. Octane number . . . . . E-4
  - g. Cetane number . . . . . E-4
  - h. Water and sediment. . . . . E-4

E. REDUCTION GEARS, REVERSE GEARS, CLUTCHES AND THRUST BEARINGS

1.00 Practical Factors

- .01 Inspect for proper lubrication and leaks on reduction gears and thrust bearings . . . . . E-4
- .40 Inspect and make minor adjustments on small craft clutches, transmissions, drive shafts (including alinement) and stern tube glands. . . . . E-5
- .41 Take oil clearance in bearings. . . . . E-5
- .60 Take thrust bearing readings. . . . . E-6
- .80 Check main reduction gears for backlash and alinement . . . . . E-7

2.00 Examination Factors

- .40 Purpose and operating principles of:
  - a. Reduction gears . . . . . E-5
  - b. Transmissions, clutches, and reverse gears. . . . . E-5
  - c. Thrust bearings . . . . . E-5
- .60 Causes and prevention of damage to shafts and thrust bearings . . . . . E-6

F. PUMPS

1.00 Practical Factors

- .01 Repack stuffing boxes on pumps. . . . . E-4
- .40 Determine clearance in pumps. . . . . E-5
- .41 Overhaul and replace parts and bearings in pumps. . . . . E-5
- .42 Check for alinement of pump driving units . . . . . E-5

2.00 Examination Factors

- .01 Operating principles of rotary, centrifugal, reciprocating and jet pumps . . . . . E-4
- .40 Procedures to be followed in repairing pumps. . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EN

G. PIPING AND VALVES

1.00 Practical Factors

- .01 Spot and grind in valves . . . . . E-4
- .02 Renew bonnet gaskets in valves . . . . . E-4
- .03 Open drains to whistle and siren . . . . . E-4
- .04 Cut in air to whistle and siren. . . . . E-4
- .40 Repack high-pressure valves in accordance with BuShips packing chart . . E-5
- .41 Reface valve seats and discs . . . . . E-5
- .42 Adjust relief, reducing and temperature-control valves to required  
pressures and temperatures . . . . . E-5
- .60 Disassemble, inspect and repair reducing, relief and temperature-control  
valves . . . . . E-6

2.00 Examination Factors

- .01 Operating principles of relief, reducing and temperature-control valves. E-4
- .02 Selection of grinding compounds. . . . . E-4
- .03 Safety precautions to be observed prior to working on air systems. . . . E-4

H. DISTILLING PLANTS AND AUXILIARY BOILERS

1.00 Practical Factors

- .01 Stand watch on auxiliary boiler. . . . . E-4
- .02 Start, operate and secure a vapor-compression distilling plant . . . . . E-4
- .03 Remove scales from evaporator tubes. . . . . E-4
- .40 Remove scale from vapor-compression distilling units chemically. . . . . E-5
- .41 Test evaporator tubes hydrostatically for leaks. . . . . E-5
- .42 Test evaporators and condensers for salt-water leaks . . . . . E-5
- .43 Conduct standard feed treatment on distilling plants . . . . . E-5
- .44 Conduct boiler feed water tests. . . . . E-5
- .45 Light-off and secure an auxiliary boiler . . . . . E-5
- .60 Plug and/or replace heat exchanger tubes . . . . . E-6
- .61 Inspect and repair auxiliary boilers . . . . . E-6

2.00 Examination Factors

- .01 Purpose and operating principles of distilling plants. . . . . E-4
- .02 Construction and operating principles of auxiliary boilers . . . . . E-4
- .03 Procedures to be followed in determining and correcting the following  
conditions in auxiliary boilers:
  - a. Low water. . . . . E-4
  - b. High water . . . . . E-4
  - c. Failure of automatic controls. . . . . E-4
- .04 Purpose and procedures for cold shocking evaporators . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EN

I. REFRIGERATION AND AIR CONDITIONING

1.00 Practical Factors

- .01 Start, operate, stand watch on and secure refrigeration and air-conditioning systems. . . . . E-4
- .40 Check for noncondensable gases and pump down refrigerant systems. . . . . E-5
- .41 Use halide torch to test for leaks on refrigeration or air-conditioning equipment. . . . . E-5
- .42 Change lubricating oil in refrigeration compressors . . . . . E-5
- .43 Test and renew suction and discharge valves in refrigeration compressors . . . . . E-5
- .60 Test and renew oil seals on refrigeration compressors . . . . . E-6
- .61 Evacuate, dehydrate, test and recharge refrigeration systems. . . . . E-6

2.00 Examination Factors

- .01 Basic theory and principles of refrigeration. . . . . E-4
- .60 Lubricant requirements and precautions when handling dehydrated oils for refrigerant systems . . . . . E-6
- .61 Construction and operation of refrigeration units and characteristics of applicable refrigerants. . . . . E-6
- .62 Purpose and operating principles of refrigeration expansion valves. . . . . E-6
- .80 Causes of inefficient operation of refrigeration and air-conditioning systems and corrective procedures. . . . . E-7

J. AIR COMPRESSORS

1.00 Practical Factors

- .01 Start, operate and secure low-, medium- and high-pressure air compressors . . . . . E-4
- .02 Check and adjust compressor-forced feed lubricators . . . . . E-4
- .40 Test and renew compressor suction and discharge valves. . . . . E-5
- .60 Test, clean and repair or replace intercoolers, aftercoolers and oil coolers . . . . . E-6
- .61 Overhaul low-, medium- and high-pressure air compressors. . . . . E-6

2.00 Examination Factors

- .01 Operating principles of low-, medium- and high-pressure air compressors . . . . . E-4
- .02 Operating principles of mechanical lubricators. . . . . E-4
- .40 Operating principles of air-compressor unloading systems. . . . . E-5

K. HYDRAULIC SYSTEMS

1.00 Practical Factors

- .01 Start, operate and secure hydraulic equipment . . . . . E-4
- .60 Replenish and vent hydraulic system and inspect pumps and associated equipment for leaks. . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EN

K. HYDRAULIC SYSTEMS - Continued

2.00 Examination Factors

- .01 Operating principles of basic hydraulic systems . . . . . E-4
- .40 Purpose and operating principles of hydraulic:
  - a. Couplings . . . . . E-5
  - b. Steering gear . . . . . E-5
  - c. Anchor windlass . . . . . E-5
- .80 Operating principles of electro-servo hydraulic valves . . . . . E-7

L. TOOLS AND INSTRUMENTS

1.00 Practical Factors

- .01 Use radiac instruments and perform monitoring operations throughout engineering spaces . . . . . E-4
- .02 Use and care for basic handtools and measuring instruments . . . . . E-4
- .40 Use dial indicators, micrometers, bridge gages and depth gages to take clearances on journals, bearings, liners and pistons . . . . . E-5
- .41 Operate an engine lathe for cutting threads, turning tapers and plain turning . . . . . E-5

2.00 Examination Factors

- .01 Purpose and operating principles of the following indicating instruments:
  - a. Bourdon-tube gage . . . . . E-4
  - b. Pyrometer . . . . . E-4
  - c. Thermocouple . . . . . E-4
  - d. Float-actuating gage . . . . . E-4
  - e. Thermometers . . . . . E-4
  - f. Liquid level indicators . . . . . E-4

M. BLUEPRINTS

1.00 Practical Factors

- .01 Use blueprints in repair or in locating valves and piping systems . . . E-4
- .02 Read and interpret blueprints, sketches and simple electrical diagrams . E-4

2.00 Examination Factors

- .01 Use of ship's plan index in filing blueprints . . . . . E-4

N. DAMAGE CONTROL

1.00 Practical Factors

- .01 Locate principal isolation valves of fire-main system . . . . . E-4
- .02 Start, operate and secure fire and flushing pump . . . . . E-4



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EN

N. DAMAGE CONTROL - Continued

1.00 Practical Factors - Continued

- .03 Start, operate and secure portable and stationary internal combustion engine-driven pumps. . . . . E-4
- .40 Inspect and repair P-250 and P-500 portable pumps. . . . . E-5

2.00 Examination Factors

- .01 Capacity and limitations of shipboard portable and stationary gasoline and diesel engine-driven fire and salvage pumps. . . . . E-4
- .40 Application of damage-control principles . . . . . E-5

O. ELECTRICITY AND ELECTRICAL EQUIPMENT

1.00 Practical Factors

- .01 Lubricating procedures for electrical equipment. . . . . E-4
- .40 Rudiments of checking electrical distribution system for grounds using available test equipment . . . . . E-5
- .41 Assist in repair and adjustment of electric motors and associated equipment. . . . . E-5
- .60 Trouble shoot electrical control circuits and follow corrective procedures . . . . . E-6
- .61 Start and secure gyrocompass . . . . . E-6
- .80 Perform routine adjustments and lubrication of gyrocompass and associated equipment . . . . . E-7

2.00 Examination Factors

- .01 Basic theory of electricity and magnetism. . . . . E-4
- .02 Principles of operation of ignition systems on gasoline engines. . . . . E-4
- .03 Care and maintenance of storage batteries. . . . . E-4
- .04 Operating principles of:
  - a. Alternators. . . . . E-4
  - b. A.C. and D.C. power generators . . . . . E-4
  - c. Distribution systems . . . . . E-4
- .40 Methods of locating and clearing grounds in electrical systems . . . . . E-5
- .60 Maintenance checks required on electrical equipment. . . . . E-6

P. SAFETY

1.00 Practical Factors

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EN

P. SAFETY - Continued

2.00 Examination Factors

- .01 First aid procedures in cases of heat exhaustion and exposure to refrigerants in liquid or gaseous states . . . . . E-4
- .39 Safety precautions to be observed when:
  - a. Working on shipboard machinery, taking on fuel and moving heavy objects. . . . . E-4
  - b. Testing injectors. . . . . E-4
  - c. Refueling and starting gasoline and diesel-powered small craft . . . E-4
  - d. Using or charging batteries. . . . . E-4
  - e. Working on air systems . . . . . E-4
  - f. Working on salt water piping systems connected directly to sea . . . E-4
  - g. Charging refrigeration systems . . . . . E-5

Q. ADMINISTRATION

1.00 Practical Factors

- .01 Take and log counter readings. . . . . E-4
- .02 Stand watch in steering engine room . . . . . E-4
- .03 Locate and use:
  - a. Current instructions and directives. . . . . E-4
  - b. Allowance books . . . . . E-4
  - c. Current supply catalogs. . . . . E-4
- .04 Act as boat engineer; perform routine operational maintenance. . . . . E-4
- .40 Locate and use appropriate sections in BuShips Technical Manual, manufacturers' manuals and handbooks to obtain necessary data when repairing machinery. . . . . E-5
- .41 Supervise routine maintenance and repair of engine-driven auxiliary equipment and other machines such as pumps, compressors, valves and piping systems . . . . . E-5
- .60 Supervise and train personnel in operation, maintenance and repair of:
  - a. Engine room equipment . . . . . E-6
  - b. Refrigeration and air-conditioning equipment . . . . . E-6
- .61 Prepare monthly summary and requisition requirements on diesel-driven ships. . . . . E-6
- .62 Supervise refueling operation; enforce safety precautions. . . . . E-6
- .80 Take charge of an engine room watch on diesel-driven ship underway. . . . E-7
- .81 Keep engine room records. . . . . E-7
- .82 Estimate time and materials needed for repair of auxiliary and main-propulsion machinery; prepare availability work requests and schedules . E-7
- .83 Supervise and prepare reports for full-power, economy, dock and post repair trails. . . . . E-7
- .84 Inspect propellers, shafts, sea valves, zincs and strut and stern tube bearings when ship is in drydock, and prepare necessary reports. . . . . E-7
- .85 Maintain CSMP and Machinery History cards. . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EN

Q. ADMINISTRATION - Continued

2.00 Examination Factors - Continued

.40	Procedures for maintaining inventories and procuring replacements . . .	E-5
.60	Selection and use of packings, greases, oils, polishes, cleaning materials, repair parts, and other engineroom supplies . . . . .	E-6
.80	Duties and responsibilities of the engineering officer of the watch . .	E-7
.81	Performance and casualty reports required by current directives and all records to be kept by the engineroom . . . . .	E-7
.82	Procedure for administrative, material, and operational readiness inspections . . . . .	E-7

★ SENIOR CHIEF ENGINEMAN (ENCS)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

.90	Provide technical information concerning maintenance, operation, capabilities, and limitations of engineering equipment and machinery. .	E-8
.91	Advise personnel regarding machinery plant efficiency and on how to recognize and correct poor performance . . . . .	E-8
.92	Train personnel in the principles, and supervise them in the operation of the following auxiliary equipment:	
	a. Fuel oil and lube oil purifiers . . . . .	E-8
	b. Air compressors . . . . .	E-8
	c. Pumps . . . . .	E-8
	d. Distilling plants . . . . .	E-8
	e. Refrigeration and air conditioning systems . . . . .	E-8
	f. Auxiliary boilers . . . . .	E-8
	g. Machine tools . . . . .	E-8
.93	Train personnel in casualty control procedures . . . . .	E-8
.94	Advise subordinate personnel in the procedures for preparing check-off lists, base or shipyard work requests, maintenance and readiness inspection reports, and engineering records . . . . .	E-8
.941	Assist in planning projects to be accomplished by the engineering department during availabilities, and supervise scheduled work . . . .	E-8
.942	Prepare technical lesson plans for the instruction of enlisted personnel on maintenance and operation of equipment, and non-technical lesson plans on training and administration . . . . .	E-8

2.00 Examination Factors

.90	General contents and scope of the NavShips Technical Manual and applicable Commandant's Instructions on standards for operation, maintenance and repair of assigned equipment . . . . .	E-8
.91	Preparation of check-off lists, work requests, and engineering records and logs . . . . .	E-8

SENIOR CHIEF ENGINEMAN (ENCS) - Continued

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EN

2.00 Examination Factors - Continued

- .92 Limitations, maintenance, and repair requirements for associated piping, valves, bearings, gears, governors, gages, clutches, and other components of assigned equipment . . . . . E-8
- .93 Procedures, practices, and techniques for performance and casualty analysis . . . . . E-8
- .94 Types, frequency, distribution, and preparation of equipment and material logs, reports and records . . . . . E-8

★ MASTER CHIEF ENGINEMAN (ENCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Supervise personnel in the repair, overhaul, and procurement of ship propulsion and auxiliary equipment . . . . . E-9
- .96 Supervise inspections and surveys of equipment . . . . . E-9
- .97 Supervise and provide guidance to personnel regarding regulations and procedures for requisitioning, surveying, stowing, accounting, and preserving engineering department equipment . . . . . E-9
- .98 Assist in the preparation of general correspondence concerning fiscal, supply, and administrative matters . . . . . E-9
- .99 Assist in the management of records . . . . . E-9
- .991 Advise subordinate personnel of new developments and new technical information concerning the capabilities, limitations, and employment of propulsion and auxiliary equipment . . . . . E-9
- .992 Assist in the formulation of plans, policies, and budget requirements for the engineering department . . . . . E-9
- .993 Prepare examinations for enlisted personnel on technical aspects of the EN rating . . . . . E-9

2.00 Examination Factors

None.

# ELECTRONICS TECHNICIAN (ET)

## GENERAL RATING

### SCOPE

Electronics Technicians maintain, repair, calibrate, tune, and adjust electronic material used for communication, detection, tracking, recognition, and identification, aids to navigation, electronic countermeasures, and radiac. (Exceptions: airborne equipment, data transmission systems, interior communications systems, teletypewriter machines, sonar, and weapons control systems.)

### SERVICE RATINGS (PO3 through PO1)

### SCOPES

#### ELECTRONICS TECHNICIAN N (Communications) - ETN

Electronics Technicians (N) maintain, repair, calibrate, tune, and adjust communication equipment, radio aids to navigation, and radio countermeasures equipment including radio equipment, facsimile equipment; teletype and cryptographic terminal equipment and similar types of terminal equipment; data transmission systems; radio direction finding equipment, radio-beacons, and equipment utilizing digital logic circuits. Clearance of SECRET-CRYPTO is required.

#### ELECTRONICS TECHNICIAN R (Radar) - ETR

Electronics Technicians (R) maintain, repair, calibrate, tune, and adjust electronic sea, land, and air detection and tracking equipment; electronic recognition and identification equipment and radar countermeasures equipment including search radar equipment, radiac equipment, IFF systems, and racons.

### QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ET ETN ETR

#### A. SAFETY

##### 1.00 Practical Factors

- |     |   |     |     |     |
|-----|---|-----|-----|-----|
| .01 | Demonstrate under simulated conditions the rescue of a person in contact with an energized electrical circuit, resuscitation of a person unconscious from electrical shock, and treatment for electrical and acid burns . . . . . | E-4 | E-4 | E-4 |
| .02 | Demonstrate, while servicing equipment, safety precautions such as tagging switches, removing fuses, and grounding test equipment, using shorting bars and rubber mats . . . . .  | E-4 | E-4 | E-4 |
| .03 | Demonstrate safety precautions for servicing equipment aloft . . . . .  | E-4 | E-4 | E-4 |

##### 2.00 Examination Factors

- |     |  |     |     |     |
|-----|--|-----|-----|-----|
| .01 | Effects of electrical shock; methods of resuscitation and types of treatment for electrical and acid burns . . . . . | E-4 | E-4 | E-4 |
| .02 | Electrical and electronic safety precautions . . . . .   | E-4 | E-4 | E-4 |

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ET ETN ETR

B. ELECTRICITY AND ELECTRONICS

1.00 Practical Factors

None.

2.00 Examination Factors

.01	Definition and usage of common electrical, magnetic, and electronic terms, including:			
	a. Volt, ohm, ampere, watt, volt-ampere, henry, and farad . . . .	E-4	E-4	E-4
	b. Cycle, ampere-turn, coulomb, circular mil, conductor, insulator, field intensity, and flux density . . . . .	E-4	E-4	E-4
	c. Gauss, permeability, hysteresis, eddy current, reactance, impedance, capacitance, inductance, self-inductance, and mutual inductance . . . . .	E-4	E-4	E-4
	d. Power factor, frequency, phase, RC time, attenuation, absorption, and conductance . . . . .	E-4	E-4	E-4
	e. Modulation, demodulation, detection, conversion, selectivity, sensitivity, and class A, B, C, and AB amplifiers . . . . .	E-4	E-4	E-4
	f. Filter, intermediate frequency, heterodyne, node, resonance, and nonlinear . . . . .	E-4	E-4	E-4
	g. Sideband, single sideband, zero beat, AGC and ganged tuning. .	E-4	E-4	E-4
.02	Interpretation of color coding of fixed resistors and capacitors . . . . .	E-4	E-4	E-4
.03	Relationship and calculation of current, voltage, and resistance in d.c. series, parallel, and series-parallel circuits . . . . .	E-4	E-4	E-4
.04	Characteristics of electrical conductors; relationship of length and cross-sectional area to resistance; relationship of resistance, current, and temperature . . . . .	E-4	E-4	E-4
.05	Methods of obtaining bias for transistors and vacuum tubes . . . .	E-4	E-4	E-4
.06	Principles and construction of a.c. and d.c. motors and generators; application of laws of magnetism to electrical rotating machinery . . . . .	E-4	E-4	E-4
.07	Symbols for, and functions of, parts in electric/electronic circuits . . . . .	E-4	E-4	E-4
.08	Types, structure, maintenance procedures, and electrical characteristics of batteries . . . . .	E-4	E-4	E-4
.09	Principles of electron tubes . . . . .	E-4	E-4	E-4
.10	Relationship and calculation of current, voltage, phase-angle, impedance, power factor and resonance in a.c. series, parallel, and series-parallel circuits . . . . .	E-4	E-4	E-4
.11	Electrical characteristics of Hertz, Marconi, and dipole antennas . . . . .	E-4	E-4	E-4
.12	Fundamental theory of solid state devices . . . . .	E-4	E-4	E-4
.13	Function and principles of basic transistor circuits . . . . .	E-4	E-4	E-4
.14	Theory of single sideband radio transmission and reception . . . .	E-4	E-4	E-4
.37	Function and principles of the following:			
	a. Audio, video, RF, IF, and DC amplifiers . . . . .	E-4	E-4	E-4
	b. Basic oscillators including blocking and Wein bridge . . . . .	E-4	E-4	E-4
	c. Basic multivibrators . . . . .	E-4	E-4	E-4
	d. Power supply circuits: rectifiers, filters, and voltage regulators . . . . .	E-4	E-4	E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ET ETN ETR

B. ELECTRICITY AND ELECTRONICS - Continued

2.00 Examination Factors - Continued

e.	Demodulation circuits for amplitude, frequency, phase, and pulse. . . . .	E-4	E-4	E-4
f.	Coupling circuits. . . . .	E-4	E-4	E-4
g.	Impedance matching, phase shifters, cathode followers, limiters and clippers, sawtooth generators, phase inverters, differentiators, integrators, peakers, and clampers. . . . .	E-4	E-4	E-4
h.	Modulation types: amplitude, frequency, phase, and pulse modulation . . . . .	E-4	E-4	E-4
i.	Modulation circuits: grid, screen, and plate. . . . .	E-4	E-4	E-4
j.	Transmission lines: resonant and non-resonant . . . . .	E-4	E-4	E-4
k.	Trigger, coincidence, counting, and phase-splitting, AFC, AVC, and delayed AVC circuits. . . . .	E-4	E-4	E-4
l.	Magnetic amplifiers. . . . .	E-5	E-5	E-5
m.	Balance modulation and demodulation for SSB. . . . .	E-5	E-5	-
n.	Filters: mechanical, xtal, and lattice. . . . .	E-5	E-5	E-5
o.	Modular construction . . . . .	E-6	-	-
p.	Special purpose tubes such as traveling wave tubes and high-powered klystron amplifier tubes. . . . .	E-6	-	E-6
.38	Function and principles of the following equipment:			
a.	Radar (surface, search, tracking, control and speed indicating). . . . .	E-4	-	E-4
b.	Radar indicators . . . . .	E-4	-	E-4
c.	Electronic counter measures, including IFF and SIF transponders . . . . .	E-4	-	E-4
d.	Radiac . . . . .	E-5	-	E-5
e.	Loran. . . . .	E-5	-	-
.39	Function and principles of the following:			
a.	Radio transmitting equipment: FM, AM, SSB, and Pulse. . . . .	E-4	E-4	-
b.	Radio receiving equipment: FM, AM, SSB, and Pulse . . . . .	E-4	E-4	-
c.	Teletype terminal equipment. . . . .	E-4	E-4	-
d.	Antenna couplers and remote control patching systems . . . . .	E-4	E-4	-
e.	Facsimile equipment. . . . .	E-5	E-5	-
f.	Electronic aids to navigation - loran, radio direction finder . . . . .	E-5	E-5	E-5
.40	Function and principles of the following digital circuits and definition of terms:			
a.	And gate . . . . .	E-5	E-5	-
b.	Or gate. . . . .	E-5	E-5	-
c.	Inverter . . . . .	E-5	E-5	-
d.	Flip Flop. . . . .	E-5	E-5	-
e.	Adder. . . . .	E-5	E-5	-
f.	BCD to decimal convertor . . . . .	E-5	E-5	-
g.	Decimal to BCD convertor . . . . .	E-5	E-5	-
h.	Storage circuit. . . . .	E-5	E-5	-
i.	Boolean algebra. . . . .	E-5	E-5	-
.41	Principles of basic meters and meter movements which involve the following:			
a.	D'Arsonval and electro-dynamometer movement . . . . .	E-5	E-5	E-5
b.	Thermocouples and rectifiers in a.c. meters. . . . .	E-5	E-5	E-5
c.	Method of connecting meter movement to parts to form voltmeter or ammeter; meaning of meter sensitivity and effects of circuit loading. . . . .	E-5	E-5	E-5
d.	Computations required to determine size of shunts and multipliers. . . . .	E-5	E-5	E-5
.42	Characteristics and principles of synchros, servo-mechanisms, and control circuits . . . . .	E-5	-	E-5

QUALIFICATIONS FOR ADVANCEMENT

B. ELECTRICITY AND ELECTRONICS - Continued

Required for  
Advancement to  
ET ETN ETR

2.00 Examination Factors - Continued

.43	Function and principles of the following:			
	a. Electronic switch, synchroscope and spectrum analyzer. . . . .	E-5	E-5	E-5
	b. Absorption wavemeter, grid dip, and radio-interference field-intensity meters . . . . .	E-5	E-5	E-5
.44	Applications and basic principles of:			
	a. Waveguides, klystrons, and crystal mixers . . . . .	E-5	-	E-5
	b. T/R and AT/R tubes and radar modulators . . . . .	E-5	-	E-5
	c. Magnetrons . . . . .	E-5	-	E-5
.60	Principles and radiation characteristics of parabolic and lens antennas . . . . .	E-6	-	-
.61	Characteristics of, and repairs and calibrations authorized on electronic test equipment . . . . .	E-6	E-6	-
.62	Cause and/or effect of sky, ground, and ground-reflected waves, and ionospheric reflecting layers and propagation . . . . .	E-6	E-6	-
.80	Polarization and directional characteristics of antenna arrays such as driven arrays (collinear), parasitic arrays (Yagi), parabolic, corner or flat reflectors, phased arrays, waveguide and type antennas . . . . .	E-7	-	-

C. OPERATIONAL MAINTENANCE

1.00 Practical Factors

.01	Inspect, clean, and lubricate electronic equipment in accordance with technical publications . . . . .	E-4	E-4	E-4
.02	Test and/or replace plugs, lamps, fuses, switches, electron tubes, jacks, cables, and wiring . . . . .	E-4	E-4	E-4
.03	Select, use, and maintain handtools and small portable power tools necessary for maintenance and repair of electronic equipment . . . . .	E-4	E-4	E-4
.04	Perform operational tests and make external adjustments on electronic equipment . . . . .	E-4	E-4	E-4
.05	Utilize distribution patching system for transmitters, receivers, and antennas for all local and remote operations positions . . . . .	E-4	E-4	E-4
.06	Inspect and clean commutators and slipring assemblies; inspect and replace brushes . . . . .	E-4	E-4	E-4
.07	Make electrical connections and splices including soldering joints . . . . .	E-4	E-4	E-4
.08	Manipulate external controls; read and interpret dials, meter indications and cathode ray tube presentations on electronic equipment . . . . .	E-4	E-4	E-4
.09	Read schematic wiring diagrams of electrical and electronic circuits; identify and interpret electrical, electronic and mechanical symbols shown in electronic maintenance publi- cations and installation blueprints . . . . .	E-4	E-4	E-4

2.00 Examination Factors

.01	Importance of using proper lubricants and solvents in maintenance of electronic equipment . . . . .	E-4	E-4	E-4
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QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ET ETN ETR

C. OPERATIONAL MAINTENANCE - Continued

2.00 Examination Factors - Continued

.02 Purpose of operator's controls and adjustments such as:			
a. Receiver gain, transmitter tuning, and antenna tuning . . . .	E-4	E-4	-
b. Radar intensity, focus, receiver tuning, antenna rotation, range, and STC . . . . .	E-4	-	E-4
.80 Effects of environmental conditions upon operation of electronic and electrical equipment and special maintenance techniques involved for equipment to be operated at either extreme of temperature and humidity . . . . .	E-7	-	-

D. TECHNICAL MAINTENANCE

1.00 Practical Factors

.01 Operate the following test equipment:			
a. Multimeters . . . . .	E-4	E-4	E-4
b. Tube tester, oscilloscope, AF signal generator, transistor and crystal checker, and synchroscope . . . . .	E-4	E-4	E-4
c. Capacitance-inductance-resistance bridge . . . . .	E-4	E-4	E-4
d. RF signal generator, frequency standards and megohmmeter . . . .	E-4	E-4	E-4
e. Range mark generator and echo boxes . . . . .	E-4	-	E-4
.02 Make tests for short circuits, grounds, and continuity of interconnecting cables between components of electronic equipment . . . . .	E-4	E-4	E-4
.03 Localize and repair equipment casualties to components of a system of electronic equipment . . . . .	E-4	E-4	E-4
.04 Locate and identify components, assemblies, sub-assemblies and primary and casualty power circuits of electronic equipment by reference to technical maintenance publications, block diagrams and installation blueprints . . . . .	E-4	E-4	E-4
.05 Locate in technical and maintenance publications information necessary for maintenance and repair of electronic equipment; enter corrections to publications when changes are made . . . . .	E-4	E-4	E-4
.06 Test electronic circuits for continuity, short circuits, and grounds; measure electrical quantities such as voltage, current, power, and frequency, and compare with established values; use an oscilloscope to view circuit waveforms and compare with established optimum performance waveforms required in electronic equipment . . . . .	E-4	E-4	E-4
.07 Perform sensitivity and selectivity measurements . . . . .	E-4	E-4	E-4
.40 Effect authorized field changes to electronic equipment in accordance with instructions and diagrams . . . . .	E-5	E-5	E-5
.41 Operate the following test equipment:			
a. Electronic switch and spectrum analyzer . . . . .	E-5	E-5	E-5
b. Absorption wavemeter, grid dip and radio-interference field-intensity meters . . . . .	E-5	E-5	E-5
.42 Aline circuits as necessary for optimum performance of electronic equipment . . . . .	E-5	E-5	E-5
.43 Localize electronic equipment casualties to parts or sub- assemblies; repair by replacement of sub-assemblies or parts . . . .	E-5	E-5	E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ET ETN ETR

D. TECHNICAL MAINTENANCE - Continued

1.00 Practical Factors - Continued

- .44 Perform tests, adjustments, and repairs of electro-mechanical servomechanisms and synchro circuits including:
  - a. Electrical zeroing of synchros . . . . . E-5 - E-5
  - b. Testing servomotors and amplidyne . . . . . E-5 - E-5
  - c. Gain, phase, and balancing adjustments . . . . . E-5 - E-5
- .45 Demonstrate correct servicing procedures for solid state components and miniaturized circuits . . . . . E-5 E-5 E-5
- .60 View and compare with established standards, waveforms of the following circuits: squaring and peaking, clamping circuits, high vacuum tube sweep generators (hard tube type), trapezoidal sweep generator, phantastrons, blocking oscillators, and counting circuits . . . . . E-6 E-6 E-6
- .61 Aline circuits by synchronizing multivibrators or blocking oscillators with sine wave, positive pulses, or sub-multiples of trigger frequency, or negative pulses . . . . . E-6 E-6 E-6
- .62 Analyze and evaluate electrical and electronic tests . . . . . E-6 E-6 E-6
- .63 Evaluate test equipment for correct operation; make authorized repairs and calibrations . . . . . E-6 E-6 E-6
- .64 Perform tests, adjustments, and repairs for operation of water and oil coolant systems . . . . . E-6 E-6 E-6
- .80 Test and evaluate for proper and secure installation and optimum performance newly installed or overhauled components, assemblies, or sub-assemblies of electronic equipment . . . . . E-7 - -

2.00 Examination Factors

- .01 Method of soldering and soldering equipment used in maintenance and repair of electronic equipment . . . . . E-4 E-4 E-4
- .02 Application of oscilloscopic waveform analysis to location of circuit malfunctions . . . . . E-4 E-4 E-4

E. ADMINISTRATION

1.00 Practical Factors

- .01 Record test data and work accomplished in required work logs, equipment histories, and checkoff lists . . . . . E-4 E-4 E-4
- .02 Take, record, and report inventories of tools and portable test equipment available for maintenance and repair of electronic equipment . . . . . E-4 E-4 E-4
- .03 Gather information for, and prepare and complete entries in, electronic equipment failure reports . . . . . E-4 E-4 E-4
- .04 Obtain part and stock numbers from technical and supply publications for replacement parts; and requisition such material . . . . . E-4 E-4 E-4
- .40 Prepare requisitions for tools . . . . . E-5 E-5 E-5
- .60 Prepare and complete periodic or recurring reports concerning performance and/or maintenance of electronic equipment . . . . . E-6 E-6 E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ET ETN ETR

E. ADMINISTRATION - Continued

1.00 Practical Factors - Continued

.61	Inspect completed work logs and check lists; review electronic equipment failure reports, requisitions for tools and replacement parts, and inventories of tools and portable test equipment . . . . .	E-6	E-6	E-6
.62	Supervise and train personnel in maintenance and repair of electronic equipment . . . . .	E-6	E-6	E-6
.63	Prepare Current Ship's Maintenance Project (CSMP) . . . . .	E-6	E-6	E-6
.64	Prepare work requests . . . . .	E-6	E-6	E-6
.80	Qualify individual operators to carry out authorized performance standards tests on electronic equipment to which assigned . . . . .	E-7	-	-
.81	Evaluate completed electronic equipment failure reports, requisitions for tools and replacement parts, inventories of tools and portable test equipment, job orders, work requests, electronic equipment histories, and periodic or recurring reports concerning performance and/or maintenance of electronic equipment . . . . .	E-7	-	-
.82	Organize and administer maintenance and repair of electronic equipment . . . . .	E-7	-	-
.83	Correct, prepare and submit preliminary equipment inventories; compare with coordinated ships' allowance list for electronics . .	E-7	-	-

2.00 Examination Factors

.01	System of assigning "AN" letter-number combinations as designation for electronic equipment . . . . .	E-4	E-4	E-4
.02	Types of information contained in electronic technical and maintenance publications . . . . .	E-4	E-4	E-4
.80	Accounting procedures for electronic equipment, maintaining control of inventories and workflow, and reporting equipment status and work accomplished . . . . .	E-7	-	-
.81	Current directives on operational and maintenance responsibilities of enlisted personnel for electronic equipment . . . . .	E-7	-	-
.82	Directives and procedures necessary to prepare electronics equipment and records for shipyard overhaul, ORI, and material inspections . . . . .	E-7	-	-

★ SENIOR CHIEF ELECTRONICS TECHNICIAN (ETCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ET

1.00 Practical Factors

- .90 Inspect work areas, tools, equipment, and test equipment to detect areas where inadequate safety precautions exist; take appropriate action to correct the situation . . . . . E-8
- .91 Interpret safety directives and instructions to identify those applicable to electronics equipment; establish procedures and standards to ensure compliance by personnel supervised . . . . . E-8
- .92 Plan and implement a comprehensive preventive maintenance program and ensure that preventive maintenance records are maintained and submitted in accordance with Coast Guard systems and directives . . . . . E-8
- .93 Plan and implement a training program for an electronics division . . . . . E-8
- .94 Test and evaluate electronic equipment against engineering standards. . . . . E-8
- .941 Organize work within an electronic maintenance shop, establish work priorities, and assign work in accordance with principles and techniques of organizational analysis and work simplification . . . . . E-8

2.00 Examination Factors

- .90 Function and organization of an electronic repair division . . . . . E-8
- .91 Systems, configuration, function, and employment of all electronic equipment in Coast Guard installations . . . . . E-8
- .92 Current Coast Guard and Navy publications concerning standard electronic equipment . . . . . E-8
- .93 Regulations pertaining to security of electronic equipment and publications . . . . . E-8

★ MASTER CHIEF ELECTRONICS TECHNICIAN (ETCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Recognize and analyze unusual failure rates of electronic equipment; make necessary changes in operation or maintenance procedures; and prepare written recommendations for possible changes to the equipment . . . . . E-9
- .96 Organize and administer a program of safety instruction for the division . . . . . E-9
- .97 Instruct personnel in, and supervise compliance with, current security regulations relative to electronics . . . . . E-9
- .98 Prepare local security instructions pertaining to electronic equipment and publications . . . . . E-9
- .99 Administer a long range, planned maintenance program for electronics department in accordance with Coast Guard systems and directives . . . . . E-9
- .991 Prepare for signature letters or reports of a technical nature . . . . . E-9
- .992 Provide technical information and advice concerning capabilities, limitations, and operation of electronic equipment . . . . . E-9
- .993 Maintain liaison with personnel of other departments for the purpose of correcting interdepartmental problems . . . . . E-9

2.00 Examination Factors

None.

MACHINIST'S MATE (MM)

GENERAL RATING

SCOPE

Machinist's Mates operate, maintain, and make repairs to ship-propulsion and auxiliary equipment, such as steam-propulsion machinery, bearings, shafts, propellers, evaporators, compressors, pumps, valves, piping, oil purifiers, heat exchangers, governors, and reduction gears; maintain and make repairs to outside machinery, such as steering engine, anchor windlass, cranes, winches, elevators, and food preparation and related utility equipment; operate, maintain, and repair refrigeration and air-conditioning equipment; and may perform duties in the generation, stowage, and transfer of the following industrial gases: oxygen, carbon dioxide, nitrogen, and acetylene.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for Advancement to MM

A. MAIN PROPULSION OPERATIONS

1.00 Practical Factors

- .01 Open and close necessary drain, injection, and overboard discharge valves when warming up and securing main steam-propulsion machinery; vent main condenser and other heat exchangers to ensure that they are not air bound . . . . . E-4
- .02 Perform required checks of lubricating oil systems and test lubrication oil pumps and low-pressure lubricating oil alarm system; see that oil is delivered to turbines, reduction gears, and thrust bearings; inspect for leaks . . . . . E-4
- .03 Clean strainers for lubricating oil, fuel oil, bilge, cooling water and other systems as installed . . . . . E-4
- .04 Shift necessary auxiliary low-pressure drains from auxiliary condenser . . . . . E-4
- .05 Ease up on stern tube packing gland, allowing a small amount of water to leak through the packing; recheck for heating after shaft is running; upon securing main engines and jacking over, set up on packing gland, making periodic checks to ensure that excess leakage is under control . . . . . E-4
- .06 Line up main lubricating oil cooler; start and secure lubricating oil pumps and purifier; drain waterside of oil coolers when secured. . . E-4
- .07 Start and secure main condensate pumps . . . . . E-4
- .08 Cut in and secure steam to whistle and siren; operate high-pressure drains correctly . . . . . E-4
- .09 Start and secure main circulating pumps . . . . . E-4
- .10 Follow procedures to warm-up, cut-in, and secure main steam lines . . . E-4
- .11 Test engine telegraph; take and log counter readings; keep Bell Sheets . . . . . E-4
- .12 Measure and record cold and hot turbine rotor positions . . . . . E-4
- .13 Warm up and secure main feed pumps; put main feed pumps on line; start auxiliary feed pump . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MM

A. MAIN PROPULSION OPERATIONS - Continued

1.00 Practical Factors - Continued

- .14 Cut in and secure gland seal steam on turbine. . . . . E-4
- .15 Start auxiliary condenser and associated systems. Shift auxiliary exhaust and low-pressure drains into it. . . . . E-4
- .16 Start and secure first and second stage air ejectors. Build up required vacuum. . . . . E-4
- .17 Ensure that all root, throttle, exhaust, suction, discharge and drain valves of all auxiliaries not in use are closed. . . . . E-4
- .18 Back all throttle valves off seat and reseal lightly by hand. Close throttle bypasses and warming-up valves. . . . . E-4
- .19 Line up system and recirculate water through deaerating tank . . . . . E-4
- .20 Rotate turbine rotors with shaft turning gear. . . . . E-4
- .21 Heat lubricating oil in sump tank to 90° F. and secure steam to heating coils. Line up lubricating oil system . . . . . E-4
- .40 Turn, spin or operate main engines. Engage and disengage jacking gear. Operate jacking gear as required . . . . . E-5
- .41 Warm-up and secure main engines. . . . . E-5
- .42 Perform minor repairs to auxiliary and main propulsion machinery . . . . . E-5
- .60 Lock and unlock one main engine while underway on remaining shaft(s) . . . . . E-6
- .61 Perform major repairs on auxiliary and main propulsion machinery and associated equipment . . . . . E-6
- .62 Make final inspection preparatory to reporting engineroom ready to answer all bells and main engines secured . . . . . E-6
- .63 Perform all routine maintenance and alignment checks for auxiliary machinery. . . . . E-6
- .80 Perform all routine maintenance and alignment checks for main propulsion machinery . . . . . E-7

2.00 Examination Factors

- .01 Types, construction, purpose and principles of operation of reduction gears. . . . . E-4
- .02 Sources of feed water leaks and conservation of makeup feed. . . . . E-4
- .03 Characteristics of lubricating oil . . . . . E-4
- .04 Purpose and principles of operation of:
  - a. Lubricating oil purifiers. . . . . E-4
  - b. Turning gears. . . . . E-4
  - c. Deaerating tank . . . . . E-4
  - d. Gland sealing system . . . . . E-4
  - e. Stern tube shaft seals, including provisions for emergency operations . . . . . E-4
- .60 Factors governing main propulsion plant efficiency, causes of poor performance and appropriate remedies . . . . . E-6
- .61 Procedures to be followed when replacing turbine or reduction gear bearings. . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MM

B. TURBINES, GENERATORS AND LATHES

1.00 Practical Factors

- .01 Use portable and installed devices to obtain axial position of turbine rotors . . . . . E-4
- .02 Use and exercise proper care of tools, including precision instruments . E-4
- .40 Use leads, dial indicators, micrometers, depth gages and inside-outside vernier calipers to take diameters and clearances on journals and bearings . . . . . E-5
- .41 Start, operate and secure steam turbine generators, including their condensing and lubricating systems . . . . . E-5
- .60 Spot-in carbon and fit labyrinth packing rings on turbines . . . . . E-6
- .61 Supervise all phases of lathe operations including use of all attachments. . . . . E-6
- .80 Take main turbine and reduction gear bearing clearances, thrust clearances and turbine blade clearances. . . . . E-7

2.00 Examination Factors

- .01 Purpose and principles of operation of lathes . . . . . E-4
- .40 Construction, purpose and principles of operation of high and low-pressure turbines and turbogenerators. . . . . E-5
- .41 Methods of fitting carbon and labyrinth packing rings to turbines. . . . E-5
- .42 Methods and procedures for starting and securing steam turbine generators . . . . . E-5
- .60 Procedures for checking and adjusting constant-speed and speed-limiting governors and over-speed trips on auxiliaries and turbogenerators. . . . E-6
- .61 Methods of taking main turbine and reduction gear bearing clearances, thrust clearances and turbine blade clearances . . . . . E-6
- .80 Procedures for replacing thrust plates in main turbine thrust and turbogenerator thrust bearings and thrust shoes in Kingsbury thrust bearings . . . . . E-7

C. DISTILLING PLANTS

1.00 Practical Factors

- .01 Check and adjust feed treatment system pumps, if installed. Calculate feed treatment required. Properly mix and inject chemicals. . . . . E-4
- .02 Perform required distillate and brine tests. Adjust brine rate. . . . . E-4
- .03 Start, operate, stand watch on, and secure installed distilling plants . E-4
- .04 Inspect and clean or renew zincs in evaporators. . . . . E-4
- .05 Removal of scale from evaporator tubes . . . . . E-4
- .60 Test evaporator and heat exchanger tubes and shells hydrostatically for leaks. Repair . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MM

C. DISTILLING PLANTS - Continued

2.00 Examination Factors

- .01 Chloride limits and frequency of tests of water in the condensers, boiler feed, and portable water systems . . . . . E-4
- .02 Construction, purpose, and principles of operation of distilling plants . . . . . E-4
- .03 Normal pressures and temperatures prevailing throughout evaporator system . . . . . E-4
- .04 Purpose and procedures for cold shocking evaporators . . . . . E-4

D. REFRIGERATION AND AIR-CONDITIONING SYSTEMS

1.00 Practical Factors

- .01 Start, operate, stand watch on, and secure refrigeration and air-conditioning systems . . . . . E-4
- .02 Use halide torch on refrigeration and air-conditioning equipment to test for leaks . . . . . E-4
- .40 Adjust thermal expansion valve, high-pressure and low-pressure switches, thermostats, cooling water regulator, and reducing valve . . . E-5
- .41 Check for non-condensable gases and pump down refrigerant systems . . . E-5
- .60 Dehydrate, test, and recharge refrigeration and air-conditioning systems . . . . . E-6
- .61 Make major overhaul of refrigerating and air-conditioning equipment, including adjustments of all controls, and testing system for proper operation . . . . . E-6
- .62 Troubleshoot electrical control circuits associated with refrigeration, air-conditioning, auto controls on air compressors, etc., and eliminate grounds, malfunctioning solenoids, or other sources of improper operation . . . . . E-6

2.00 Examination Factors

- .01 Construction and operation of refrigerating units; characteristics of refrigerants . . . . . E-4
- .40 Purpose and principles of operation of refrigeration expansion valves. . E-5
- .41 Lubricant requirements and precautions when handling dehydrated oils for refrigerant systems . . . . . E-5
- .60 Causes of inefficient operation of refrigerating systems and corrective procedures . . . . . E-6

E. WATCHSTANDING AND SAFETY PRECAUTIONS

1.00 Practical Factors

- .01 Stand watch in steering engine room . . . . . E-4
- .02 Stand main engine throttle watch . . . . . E-4
- .03 Act as boat engineer; perform routine maintenance on small craft . . . . E-4
- .40 Start, place on the board, and parallel two generators, and change the electrical load from one generator to the other . . . . . E-5



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MM

E. WATCHSTANDING AND SAFETY PRECAUTIONS - Continued

1.00 Practical Factors - Continued

- .60 Take charge of an engineroom watch on steam-propelled vessel . . . . . E-6
- .80 Take complete charge of an engineering department on a small vessel,  
or an engineroom on a large vessel . . . . . E-7

2.00 Examination Factors

- .01 First aid procedures in instances of exposure to refrigerants in liquid  
or gaseous states and in instances of electrical shock and heat  
exhaustion . . . . . E-4
- .02 Safety precautions to be observed when working on shipboard machinery,  
taking on fuel and moving or lifting heavy objects . . . . . E-4
- .03 Uses and characteristics of industrial gases . . . . . E-4
- .60 Duties, authority and responsibilities of the engineering officer  
of the watch . . . . . E-6

F. VALVE REPAIR AND MAINTENANCE

1.00 Practical Factors

- .01 Spot and grind-in valves . . . . . E-4
- .02 Renew bonnet gaskets and seal rings in valves. . . . . E-4
- .03 Make minor repairs to insulation or lagging on piping. . . . . E-4
- .04 Repack high-pressure valves. . . . . E-4
- .40 Reface valve seats and disks . . . . . E-5
- .41 Repair and adjust regulating valves. . . . . E-5
- .42 Adjust thermostatically controlled recirculating valves. . . . . E-5
- .60 Set relief valves and blow back rings to required pressure . . . . . E-6

2.00 Examination Factors

- .01 Purpose and principles of operation of common shipboard valves . . . . . E-4

G. PUMP REPAIR AND MAINTENANCE

1.00 Practical Factors

- .01 Repack stuffing boxes on centrifugal pumps with specified packing  
using packing chart. . . . . E-4
- .02 Renew packing rings in water end of reciprocating pump . . . . . E-4
- .40 Fit rings to steam piston and steam cylinder of reciprocating pumps. . . . . E-5
- .41 Overhaul steam chest of reciprocating pump . . . . . E-5
- .42 Fit bearings of centrifugal pumps by filing bearing cap, adding shims,  
and/or scraping. . . . . E-5
- .43 Check alinement of centrifugal pump driving unit. Correct as required . . . . . E-5
- .44 Repair pump pressure regulators. . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MM

G. PUMP REPAIR AND MAINTENANCE - Continued

1.00 Practical Factors - Continued

- .45 Adjust and set cushioning valves and valve gear in reciprocating pumps. . . . . E-5
- .46 Polish cylinder wall of water end and steam end of reciprocating pump. . . . . E-5
- .47 Take clearances and replace wearing rings on centrifugal pumps . . . . . E-5
- .48 Grind in or replace valve disks and seats in water end of reciprocating pumps. . . . . E-5
- .49 Renew weak or broken valve springs in water end of reciprocating pumps . . . . . E-5
- .60 Aline upper and lower cylinders of reciprocating pumps . . . . . E-6
- .61 Overhaul and set governors on centrifugal type pumps . . . . . E-6

2.00 Examination Factors

- .01 Types, purposes and principles of operation of rotary, reciprocating, centrifugal, and variable stroke pumps . . . . . E-4
- .40 Procedures to be followed when renewing ram packing on hydraulic steering gears and elevators . . . . . E-5
- .41 Procedures to be followed when changing seals and gaskets on hydraulic equipment. . . . . E-5
- .42 Purpose and principles of operation of centrifugal pump governors and thrust bearings. . . . . E-5
- .60 Procedures to be followed when replacing rotors in main feed, main feed booster, main condensate, and main lubricating oil pumps. . . . . E-6

H. CONDENSER REPAIR AND MAINTENANCE

1.00 Practical Factors

- .01 Make and install zincs in salt water circulating systems. Maintain zinc inspection record. . . . . E-4
- .02 Clean salt water and steam sides of main and auxiliary condensers. . . . . E-4
- .03 Clean air ejector steam strainers and condenser tubes. . . . . E-4
- .40 Make air and soapsuds test on main and auxiliary condenser . . . . . E-5
- .60 Clean air ejector nozzles and diffusers. . . . . E-6
- .61 Plug condenser tubes . . . . . E-6

2.00 Examination Factors

- .01 Purpose and principles of operation of main and auxiliary condensers . . . . . E-4
- .02 Purpose and principles of operation of air ejectors. . . . . E-4
- .40 Methods of testing condensers for salt water leaks . . . . . E-5
- .41 Safety consideration in opening watersides of main and auxiliary condensers . . . . . E-5
- .60 Procedures for using main circulating pumps to pump engineroom bilges. . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MM

I. COMPRESSOR REPAIR AND MAINTENANCE

1.00 Practical Factors

- .40 Test and renew suction and discharge valves on air compressors . . . . . E-5
- .60 Lap and replace oil seals on refrigeration compressors . . . . . E-6

2.00 Examination Factors

- .01 Construction, purpose and principles of operation of compressors . . . . . E-4

J. EMERGENCY REPAIRS AND CASUALTY CONTROL

1.00 Practical Factors

- .01 Use radiac instruments and perform monitoring operations on salt water intake lines and engineering ventilation supply systems. . . . . E-4
- .02 Demonstrate procedures to be followed when the following occur:
  - a. Loss of circulating water to main condenser. . . . . E-4
  - b. Jammed throttle. . . . . E-4
  - c. Loss of main lubricating oil pressure. . . . . E-4
  - d. Loss of vacuum . . . . . E-4
  - e. Loss of main steam pressure. . . . . E-4
  - f. Loss main feed pressure. . . . . E-4
  - g. Bearing overheats. . . . . E-4
  - h. Loud metallic noise is heard in reduction gear or main engine. . . . . E-4
  - i. Unusual noise or vibration is observed in main turbine . . . . . E-4
  - j. Casualty to steering engine. . . . . E-4
  - k. Generator trips out on overload. . . . . E-4
  - l. Low or high water occurs in DA tank. . . . . E-4

2.00 Examination Factors

- .39 Procedures to be followed when the following casualties occur:
  - a. Leak in condenser. . . . . E-4
  - b. Deaerating feed tank water level drops steady steaming . . . . . E-4
  - c. Deaerating tank too full . . . . . E-4
  - d. Gage glass on evaporator breaks. . . . . E-4
  - e. Cooling water to auxiliaries fails . . . . . E-4
  - f. Lubricating oil cooler tube carries away . . . . . E-4
  - g. Lubricating oil leak into engineroom . . . . . E-4
  - h. Excessive lubricating oil pump discharge pressure. . . . . E-4
  - i. Hot bearings and treatment of overheated bearings. . . . . E-4
  - j. Empty feed bottom in use for makeup feed . . . . . E-4
  - k. Steering gear and propeller casualty near miss . . . . . E-4
  - l. Fuel oil in fuel oil heater drains . . . . . E-4
  - m. Casualty to the deaerating feed tank (DFT) . . . . . E-5
  - n. Rupture in fire main piping (engineering spaces) . . . . . E-5
  - o. Rupture in salt water cooling service piping . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MM

J. EMERGENCY REPAIRS AND CASUALTY CONTROL - Continued

2.00 Examination Factors - Continued

p. Shaft vibrates excessively . . . . .	E-5
q. Unusual noise in reduction gear. . . . .	E-5
r. Metallic noise coming from turbine . . . . .	E-5
s. Turbine begins to vibrate. . . . .	E-5
t. Unusual noise from pump end of main feed pump when starting. . . . .	E-5
u. Rupture in fuel-oil suction and transfer piping. . . . .	E-5
v. Rupture in main feed piping. . . . .	E-5
w. Rupture in high pressure drain piping. . . . .	E-5
x. Rupture in fuel oil heating drain piping . . . . .	E-5
y. High oil level in reduction gear case-oil emulsion . . . . .	E-6
z. Locking and unlocking of shaft underway. . . . .	E-6
aa. Rupture in main steam piping (split-plant) . . . . .	E-6
bb. Rupture in auxiliary steam piping. . . . .	E-6
cc. Rupture in auxiliary exhaust piping. . . . .	E-6
dd. Main turbine casualty near miss. . . . .	E-6
ee. Fireroom explosion-torpedo hit . . . . .	E-6
ff. Engineroom explosion-shell hit . . . . .	E-6
gg. Engineroom explosion-torpedo hot . . . . .	E-6
.80 Application of damage control principles as set forth in Chapter 88, BuShips Technical Manual . . . . .	E-7

K. RECORDS, MANUALS AND REPORTS

1.00 Practical Factors

.01 Locate and use current instructions, allowance books and supply catalogs . . . . .	E-4
.40 Be familiar with the preparation of:	
a. Machinery Index. . . . .	E-5
b. Machinery History. . . . .	E-5
c. Periodic external reports. . . . .	E-5
d. CSMP . . . . .	E-5
e. Engineering Log. . . . .	E-5
f. Other records required by current directives . . . . .	E-5
.41 Prepare quarterly requisition requirements for engineering department of unit. . . . .	E-5
.42 Use appropriate section of BuShips Technical Manual, manufacturers' technical manuals, mechanical drawings and handbooks to obtain data when repairing machinery. . . . .	E-5
.60 Make out a unit record card and a repair card for Current Ship's Maintenance Project (CSMP) . . . . .	E-6
.61 Prepare reports and records required by engineering department . . . . .	E-6
.80 Keep records and prepare naval shipyard and availability work requests . . . . .	E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MM

L. ADMINISTRATION

1.00 Practical Factors

- .40 Supervise routine maintenance and repair of pumps, compressors, evaporators, valves, and piping system . . . . . E-5
- .60 Supervise minor repairs to auxiliary and main propulsion machinery . . . . . E-6
- .80 Supervise and train personnel in operation, maintenance and repair of:
  - a. Engineroom equipment . . . . . E-7
  - b. Refrigeration and air-conditioning equipment . . . . . E-7
  - c. Auxiliary equipment. . . . . E-7
- .81 Estimate time and material needed for repair of auxiliary and main propulsion machinery . . . . . E-7
- .82 Plan and schedule work to be accomplished by engineering department during shipyard availability . . . . . E-7
- .83 Supervise and make out reports for full power, economy, dock and post repair trials. . . . . E-7

2.00 Examination Factors

- .40 Use of allowance lists, general stores catalog, and procedures for maintaining inventories and obtaining replacements . . . . . E-5
- .41 Selection, procurement and use of packings, greases, oils, polishes, cleaning materials, spare parts and other engineroom supplies. . . . . E-5
- .80 Procedures to be followed when inspecting propellers, shafts, sea valves, zincs and strut and stern tube bearings when ship is in drydock. . . . . E-7
- .81 Administrative, material and operational readiness . . . . . E-7

M. REMOTE AUXILIARY EQUIPMENT

1.00 Practical Factors

- .40 Repair and maintain:
  - a. Whistle and siren. . . . . E-5
  - b. Steering engines . . . . . E-5
  - c. Anchor windlass, cranes and winches. . . . . E-5
  - d. Food preparation and dishwashing machinery . . . . . E-5
  - e. Safety devices and operating gear on laundry machinery . . . . . E-5
- .60 Operate, stop, and secure gyrocompass. . . . . E-6

2.00 Examination Factors

- .40 Construction and principles of operation of steering engines, anchor windlass, cranes and winches . . . . . E-5

★ SENIOR CHIEF MACHINIST'S MATE (MMCS)

GENERAL REQUIREMENTS

Chief Machinist's Mates (MMC), eligible to participate in the E-8 examination for Senior Chief Machinist's Mate (MMCS), should be knowledgeable of both the examination factors and the knowledge aspects of the practical factors currently required of the BT3 and BT2.

QUALIFICATIONS FOR ADVANCEMENT

	Required for Advancement to MM
1.00 Practical Factors	
.90 Instruct and supervise personnel in types, capabilities, and limitations of ship propulsion and auxiliary equipment . . . . .	E-8
.91 Advise personnel in propulsion plant efficiency and in recognition and correction of poor performance factors . . . . .	E-8
.92 Train and supervise personnel in the principles of operation of the following major equipment and their auxiliaries:	
a. Reduction gears . . . . .	E-8
b. Turbines and turbogenerators . . . . .	E-8
c. Distilling plants . . . . .	E-8
d. Refrigerating and air-conditioning units . . . . .	E-8
.93 Advise personnel in time and material estimates for repair of ship propulsion and auxiliary equipment . . . . .	E-8
.94 Exercise control of allowance lists, catalogs, and procedures to maintain inventories and replacements of supplies and parts . . . . .	E-8
.941 Indoctrinate subordinate personnel on policies contained in NavShips Technical Manual and other manuals relating to propulsion equipment, reports, records, work requests, machinery history, and CSMP . . . . .	E-8
.942 Train, instruct, and supervise personnel in procedures for casualty control . . . . .	E-8
.943 Assist in planning and supervise all scheduled work and planned projects to be accomplished by engineering department during availabilities . . . . .	E-8
2.00 Examination Factors	
.90 General contents and scope of the NavShips Technical Manual and applicable Commandant's Instructions on standards for operation, maintenance, and repair of assigned equipment . . . . .	E-8
.91 Preparation of check-off lists, work requests, and engineering records and logs . . . . .	E-8

★ MASTER CHIEF MACHINIST'S MATE (MMCM)

GENERAL REQUIREMENTS

Senior Chief Machinist's Mates (MMCS), eligible to participate in the E-9 examination for Master Chief Machinist's Mate (MMCM), should be knowledgeable of the examination factors and the knowledge aspects of the practical factors currently required of the BT1 and BTC.

MASTER CHIEF MACHINIST'S MATE (MMCM) - Continued

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MM

1.00 Practical Factors

- .95 Supervise and assist personnel in the repair, overhaul, and procurement of ship propulsion and auxiliary equipment . . . . . E-9
- .96 Supervise inspections and surveys of equipment . . . . . E-9
- .97 Supervise and provide guidance to personnel regarding regulations and procedures for requisitioning, surveying, stowing, accounting, and preservation of engineering department equipment . . . . . E-9
- .98 Assist in the preparation of general correspondence concerning fiscal, supply, and administrative matters . . . . . E-9
- .99 Assist in the management of records . . . . . E-9
- .991 Advise subordinate personnel of new developments and new technical information concerning the capabilities, limitations, and employment of propulsion equipment . . . . . E-9
- .992 Assist in the formulation of plans, policies, and budget requirements for the engineering department . . . . . E-9
- .993 Prepare examinations for enlisted personnel on technical aspects of the MM rating.

2.00 Examination Factors

None.

MACHINERY REPAIRMAN (MR)

EMERGENCY RATING

SCOPE

Machinery Repairmen make shop repairs on shipboard machinery; use lathes, milling machines, boring mills, grinders, power hacksaws, drill presses, and other machine tools; and use handtools and measuring instruments.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MR

A. GRINDERS, SAWS AND DRILLING MACHINES

1.00 Practical Factors

- .01 Insert metal bandsaws and file bands of various widths into the appropriate machine and adjust the band for tension. . . . . E-4
- .02 Use metal bandsaw attachments in contour sawing. . . . . E-4
- .03 Perform angular and disk metal bandsaw cutting . . . . . E-4
- .04 Use a bench grinder to grind cutter bit, for left-hand, roundnose, and right-hand turning; left-hand facing, threading, and cutting-off . . . . E-4
- .05 Grind chisels, screwdrivers, center punches, and twist drills on a bench grinder. . . . . E-4
- .06 True and dress grinding wheels on a bench grinder . . . . . E-4
- .07 Grind tungsten carbide tools . . . . . E-4
- .08 Perform drilling, reaming, tapping, counterboring, and countersinking, using a drill press; adjust speeds and feeds . . . . . E-4
- .09 Mount, dress, and true grinding machine wheels . . . . . E-4
- .40 Perform grinding operations on a surface grinder, using a magnetic chuck . . . . . E-5
- .41 Grind cutter bits on a surface grinder for Acme and square threading. . . . . E-5
- .42 Select grinding wheels and cutting fluids. . . . . E-5
- .43 Set up and grind slabbing, formed, angular, and staggetooth cutters; end mills and taps, using a cutter grinder. . . . . E-5
- .44 Set up and grind pump shafts, using a cylindrical grinder. . . . . E-5
- .60 Set up and align portable in-place valve seat grinding machines; select abrasives . . . . . E-6

2.00 Examination Factors

- .01 Principal parts and principles of operation of surface, plain cylindrical and tool and cutter grinders . . . . . E-4

B. SHAPERS, PLANERS AND PANTOGRAPHS

1.00 Practical Factors

- .01 Compute feeds and speeds for shapers and planers . . . . . E-4
- .02 Lay out, set up and machine flat and angular surfaces using a shaper or planer . . . . . E-4



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MR

B. SHAPERS, PLANERS AND PANTOGRAPHES - Continued

1.00 Practical Factors - Continued

- .03 Grind pantograph cutter bits and stylus points, using pantograph bit grinder . . . . . E-4
- .04 Cut keyways in shaft with a shaper or planer . . . . . E-4
- .05 Machine steel wedges, using universal table and vise on a shaper or planer . . . . . E-4
- .06 Engrave brass, monel and plastic nameplates with pantograph. . . . . E-4
- .07 Set up and use index and radius plates on circular work on a pantograph . . . . . E-4
- .40 Lay out and cut keyways in gear blanks, using a shaper or planer . . . . . E-5
- .41 Cut a gear rack, using a shaper or planer. . . . . E-5
- .42 Machine a concave or convex surface, using a shaper or planer. . . . . E-5

2.00 Examination Factors

None.

C. LATHES

1.00 Practical Factors

- .01 Use an engine lathe for:
  - a. Plain turning between centers. . . . . E-4
  - b. Drilling, reaming, tapping, and boring operations. . . . . E-4
  - c. Cutting external and internal screw threads. . . . . E-4
- .02 Calculate the pitch, straight depth, slant depth, and major and minor diameters of common screw thread forms used in a machine shop. . . . . E-4
- .03 On an engine lathe:
  - a. Use compound rest in taper turning and compute feeds and speeds for plain turning. . . . . E-4
  - b. Use steady rest and follower rests in turning long shafting. . . . . E-4
- .04 Read micrometers, depth gages, vernier calipers, protractors, and dial indicators. . . . . E-4
- .05 Calculate:
  - a. Ratio of simple gear trains. . . . . E-4
  - b. Linear dimensions and area of circles, rectangles and triangles. . . . . E-4
  - c. Volume of cylinders and cubes. . . . . E-4
  - d. Ratio gear trains using compound gearing . . . . . E-4
- .06 Turn replacement pump shafts and valve stems, using an engine lathe. . . . . E-4
- .07 Cut tapers, using tailstock setover method or taper attachment on an engine lathe. . . . . E-4
- .40 Grind in and set cutters for a horizontal turret lathe . . . . . E-5
- .41 Set up for taper turning on a vertical turret lathe. . . . . E-5
- .42 Set up and grind valve seats and disks using a tool post grinder . . . . . E-5
- .43 Cut multiple screw threads, using an engine lathe. . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MR

C. LATHES - Continued

1.00 Practical Factors - Continued

- .44 Mount work off-center on an engine lathe faceplate for eccentric machining operations . . . . . E-5
- .45 Set up a horizontal turret lathe for manufacture of studbolts. . . . . E-5
- .46 Use test bar and dial indicator to check alinement and accuracy of engine and turret lathes. Correct deficiencies . . . . . E-5
- .60 Use relieving attachments when manufacturing taps and dies on an engine lathe. . . . . E-6
- .61 Machine pump liners and manufacture piston rings using a vertical turret lathe . . . . . E-6
- .62 Lay out and cut metal and non-metallic characteristics cams for light and fog signal controls. . . . . E-6

2.00 Examination Factors

- .01 Advantages and limitations of metals from which valves are made. . . . . E-4

D. MILLING MACHINES

1.00 Practical Factors

- .01 Perform plain milling on round, square and flat shapes of metals and plastics on a milling machine; set up various cutter combinations. . . . . E-4
- .02 Mill keyways in shafts on a milling machine. . . . . E-4
- .03 Machine flats on nuts and bolts on a milling machine . . . . . E-4
- .04 Compute feeds and speeds for milling machine . . . . . E-4
- .05 Face valve flanges, using a boring mill and a facing head. . . . . E-4
- .40 Cut T-slots and dovetails, using a milling machine . . . . . E-5
- .41 Use test bar and dial indicator to check alinement and accuracy of milling machines. Correct deficiencies. . . . . E-5
- .60 Perform drilling, reaming and boring operations, using a horizontal boring mill . . . . . E-6
- .61 Aline and bore split bearings, using a horizontal boring mill. . . . . E-6
- .62 Aline and bore pump cylinder liners, using a horizontal boring mill. . . . . E-6
- .63 Compute, set up and machine bevel, helical, and worm gears, using a milling machine. . . . . E-6
- .64 Use circular milling table for facing or T-slot milling on a milling machine. . . . . E-6
- .65 Broach internal spline in gear blank, using a slotter. . . . . E-6
- .66 Compute, lay out and cut a spur gear . . . . . E-6
- .67 Set up dividing head of milling machine for:
  - a. Rapid and plain indexing . . . . . E-6
  - b. Angular, compound and differential indexing. . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MR

D. MILLING MACHINES - Continued

2.00 Examination Factors

None.

E. TESTS

1.00 Practical Factors

- .40 Identify metals by chip, surface appearance and spark test . . . . . E-5
- .41 Operate a metal-hardness tester and interpret its readings . . . . . E-5
- .60 Use portable balancing equipment in checking the balance of machinery. . . . . E-6
- .61 Operate balancing machines, making necessary corrections . . . . . E-6
- .80 Make required shop inspections and tests on repaired machinery and equipment. . . . . E-7

2.00 Examination Factors

- .01 Physical properties of metals, alloys and plastics, and effect of these properties on cutting speed and choice of cutting tools. . . . . E-4

F. SPRAYING AND LUBRICATION

1.00 Practical Factors

- .01 Select and use cutting and lubricating oils and lubricate machine tools in shop. . . . . E-4
- .60 Prepare surface for metal spraying . . . . . E-6
- .61 Set up and operate metalizing equipment for spraying . . . . . E-6

2.00 Examination Factors

None.

G. MACHINE SHOP MANAGEMENT AND PROCEDURES

1.00 Practical Factors

- .01 Locate principal isolation valves of firemain system . . . . . E-4
- .02 Identify stock metals by standard markings . . . . . E-4
- .03 Read mechanical shop drawings. . . . . E-4
- .04 Lay out pipe and valve flanges, using temporary centers. . . . . E-4
- .05 Use measuring instruments in the performance of shop work. . . . . E-4
- .40 Turn out replacement parts in accordance with drawings and specifications . . . . . E-5
- .41 Take charge of tool issue room . . . . . E-5
- .60 Supervise manufacture of replacement parts . . . . . E-6
- .61 Supervise shop repair and overhaul of machinery and equipment. . . . . E-6
- .62 Enforce personnel and material safety precautions in shopwork. . . . . E-6
- .63 Make working sketches of machine parts . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MR

G. MACHINE SHOP MANAGEMENT AND PROCEDURES - Continued

1.00 Practical Factors - Continued

- .64 Organize and supervise a repair party unit . . . . . E-6
- .65 Obtain replacement parts and supplies. . . . . E-6
- .66 Schedule and assign workload to machines . . . . . E-6
- .80 Estimate time and material needed for machine shop work. . . . . E-7
- .81 Locate and use appropriate sections of BuShips Technical Manual,  
manufacturers' technical manuals, and handbooks to obtain data  
when repairing machinery. . . . . E-7
- .82 Enforce proper working procedures on machine tools . . . . . E-7
- .83 Supervise inventory of machine tools, accessories, portable  
power tools and handtools. . . . . E-7

2.00 Examination Factors

- .01 Safety precautions involved in performing machinery repair work. . . . . E-4
- .02 Care and stowage of the following precision instruments:  
micrometers, depth gages, vernier calipers, protractors,  
and dial indicators. . . . . E-4
- .03 Nomenclature and use of handtools. . . . . E-4
- .04 Care, stowage and operation of pneumatic and electric handtools. . . . . E-4
- .05 Care and general maintenance of machine tools and handtools  
found in the shop. . . . . E-4
- .40 Advantages and limitations of high-speed steel and cemented  
carbide tools. . . . . E-5
- .60 Use of allowance lists for machine shop repair parts, tools and supplies E-6
- .61 Heat treatments required to change properties of ferrous and  
nonferrous metals. . . . . E-6
- .80 Records kept by a repair department: work requests, job orders  
progress reports, and departure reports . . . . . E-7

SHIPFITTER (SF)

SERVICE RATING (PO1 and CPO)

SCOPE

Shipfitters plan, supervise and perform tasks necessary for fabrication, installation and repair of metal structures and installations and maintenance of shipboard and shorebased plumbing and high- and low-pressure piping systems; organize, supervise and train personnel in maintenance and repair duties; supervise and perform tasks in procurement and issuance of supplies and repair parts; instruct personnel and enforce safety precautions; prepare records and reports; and perform tasks associated with damage control.

SERVICE RATINGS (FO3 and PO2)

SCOPES

SHIPFITTER M (Metalsmith) - SFM

Shipfitters (M) lay out, fabricate, install and repair metal structures; operate furnaces and forges; lay out, bend, shear, rivet, weld, braze, tin and solder sheet metal; and perform tasks associated with damage control.

SHIPFITTER P (Pipefitter) - SHP

Shipfitters (P) perform shipboard and shore-based high- and low-pressure pipefitting; lay out, assemble, install, maintain and repair plumbing and other sanitary equipment and fixtures; lag and cover piping; and perform tasks associated with damage control.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SF SFM SFP

A. CUTTING, WELDING AND ALLIED PROCESSES

1.00 Practical Factors

.01	Operate and weld with (Coast Guard) approved welding power source machines; select specified filler metals for welding, brazing and surfacing in accordance with Coast Guard welding standards . . . . .	E-4	E-4	-
.02	Select proper equipment and use specified procedures and materials in oxyacetylene welding, cutting, surfacing and heating operations. . . . .	E-4	E-4	-
.03	Prepare wire rope for cutting and cut with an oxyacetylene cutting torch. Prepare wire rope fitting and pour a socket . . .	E-4	-	-
.04	Prepare zinc chloride (cut acid). . . . .	E-4	E-4	-
.05	Perform the following types of weld:			
a.	Make a 1/4-inch size double fillet arc weld in a 3/8-inch thick carbon steel tee, and a 3/8-inch size veebutt weld with carbon steel backing, between two 3/8-inch thick carbon steel plates, using Mil-6011 electrodes, in all positions . . . . .	E-4	-	-
b.	Oxyacetylene gas weld mild steel sheet and tube up to 1/8-inch thick, and square butt joints (Mil-Std-22), in all positions. . . . .	E-4	-	-
c.	Identify, prepare, fit, torch-braze and visually inspect 1-inch or 2-inch diameter copper-base tubing and fittings in accordance with applicable BuShips standards.	E-4	-	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SF SFM SFP

A. CUTTING, WELDING AND ALLIED PROCESSES - Continued

1.00 Practical Factors - Continued

.06	Lay out, gas-cut, assemble, erect and weld carbon steel structural joint, groove and fillet (Mil-Std-22) in material up to 3/4-inch thickness, in all positions, using Mil-6011 electrodes, in accordance with applicable standards . . . . .	E-4	E-4	-
.07	Use a soldering copper to solder a drip pan to withstand a visual and leakage test; use prepared soft soldering fluxes. . . . .	E-4	E-4	-
.08	Perform soft-soldering operations, using torch and soldering copper. . . . .	E-4	E-4	-
.09	Pass the following welding and brazing tests: (All preparatory work and welding shall be visually inspected for compliance with the applicable welding standards.)			
a.	Torch braze joints between tubes and fittings of copper-base alloys not over 1/4-inch thick in accordance with the applicable standard . . . . .	-	E-4	-
b.	Arc weld an ungrooved (Mil-Std-22) joint between a 3-inch diameter carbon steel pipe and a 3/8-inch thick carbon steel plate, with the pipe in fixed horizontal-axis position, using Mil-6011 electrodes. Weld size 3/8-inch. . . . .	-	E-4	-
c.	Arc weld a vee-groove butt joint, with backing ring, in up to 3/8-inch thick carbon steel pipe, with Mil-6011 electrodes, in vertical and horizontal (axis) fixed positions . . . . .	-	E-4	-
.10	Operate and repair portable oxygen-acetylene cutting outfit . . .	E-4	E-4	-
.40	Repair broken or defective castings, using both arc and acetylene welding process . . . . .	E-5	-	-
.41	Pass the following welding tests: (See Performance Test Instructions)			
a.	Make a 3/8-inch size double-fillet weld in a 1/2-inch thick carbon steel tee joint, in the overhead and vertical fixed positions, with Mil-7018 electrodes, for visual inspection of entire procedure, under applicable standards. . . . .	E-5	E-5	-
b.	Make a 3/4-inch size single-bevel butt weld, with backing, in carbon steel 3/4-inch thick plate, in vertical and overhead fixed positions using Mil-8018 electrodes. (Visual inspection of entire procedure under applicable standards.) . . . . .	E-5	E-5	-
c.	Weld-metal surfacing with the oxyacetylene process, in the flat position in ferrous and nonferrous materials . . . .	E-5	E-5	-
d.	Weld-metal surfacing with the manual inert-gas and covered electrode shielded metal arc welding processes, all positions, in ferrous and nonferrous materials. . . . .	E-5	E-5	-
.42	Perform the following welding operations:			
a.	Arc backed vee butt joints in 3/8-inch thick carbon-molybdenum and chromium-molybdenum steel pipes, horizontal-axis and vertical-axis and vertical-axis fixed positions, with electrodes and procedures specified in the applicable standards . . . . .	E-5	E-5	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SF SFM SFP

A. CUTTING, WELDING AND ALLIED PROCESSES - Continued

1.00 Practical Factors - Continued

b.	Arc weld backed vee butt joints in 1/4-inch thick, copper-nickel, nickle-copper, and stainless steel (Type 304) pipes, horizontal-axis and vertical-axis fixed positions, with electrodes and procedures specified in the applicable standards . . . . .	E-5	E-5	-
c.	Manual inert-gas (Mig) weld structural aluminum-magnesium alloy (500X series) in a double-fillet tee joint, and a backed vee butt joint in 1/4-inch thick material, in all positions, using approved filler metals and procedures. . . .	E-5	E-5	-
d.	Tungsten-inert-gas (Tig) weld square butt joints in 1/16-inch thick carbon steel, copper-nickel, stainless steel (304), nickel-copper and aluminum-magnesium alloys, all positions, using approved filler metals and procedures. .	E-5	E-5	-
.43	Weld and chalk plating sections . . . . .	E-5	-	-
.60	Select specified materials, gas-cut, form, fit to specified tolerances, tack weld and visually inspect welded joints in ferrous and nonferrous pipe or plate, according to standards covering the procedure. . . . .	-	-	E-6
.61	Plan, direct, inspect visually, and test in accordance with the applicable welding standards, the braxing or welding work performed by the ships force as follows: (See Performance Test Instructions)			
a.	A silver-brazed joint in 2-inch diameter copper-nickel material, tube-to-coupling. . . . .	-	-	E-6
b.	The fit-up and surfaces of a manual metallic shielded arc welding butt joint in a 2-inch or 3-inch diameter chrome-moly steel pipe . . . . .	-	-	E-6
c.	A full-penetration weld in a simulated sea connection, 3-inch carbon steel pipe to 3/4-inch thick Hy80 plate . . . .	-	-	E-6
d.	The layout, cutting and preparation of an approved joint between a 6-inch carbon steel pipe and a 3-inch CRES branch at 60 degree angle, in accordance with standards for P-1 piping. . . . .	-	-	E-6
.62	Write a complete welding and inspection procedure for removal and renewal of an aluminum alloy bulkhead in a deckhouse riveted to a steel deck . . . . .	-	-	E-6
.80	Straighten welded structures by the spot-heating method . . . .	-	-	E-7

2.00 Examination Factors

.01	Types, uses and care of soldering copper. . . . .	E-4	E-4	-
.02	Corrosive and noncorrosive classes of fluxes. . . . .	E-4	E-4	-
.03	Fluxes and materials used in making metallic splices. . . . .	E-4	E-4	-
.04	Filling, lighting-off operating and securing a blowtorch. . . .	E-4	E-4	-
.05	Factors determining current settings made and electrodes used on a.c. and d.c. welding equipment. . . . .	E-4	E-4	-
.40	Methods for controlling and utilizing the stresses and movement of parts caused by welding and other heat sources. . . .	E-5	E-5	-
.41	Approved joints in welding ship structures and fittings . . . .	E-5	E-5	-
.42	Principles of arc and acetylene welding processes . . . . .	E-5	E-5	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SF SFM SFP

B. SHEARING, DRILLING, GRINDING, SAWING AND THREADING

1.00 Practical Factors

- .01 On a bench grinder:
  - a. Dress a wheel . . . . . E-4 E-4 -
  - b. Adjust the tool rest. . . . . E-4 E-4 -
  - c. Grind straight, round and bevel edges . . . . . E-4 E-4 -
  - d. Grind chisels, screw drivers, center punches and twist drills. . . . . E-4 E-4 -
- .02 Drill, ream and countersink, using a drill press with related equipment; adjust feeds and speeds on a drill press . . . . . E-4 E-4 -
- .03 Select and use cutting fluids for drilling operations . . . . . E-4 E-4 -
- .04 Operate portable electric and pneumatic drills, hammers and grinders. . . . . E-4 E-4 -
- .05 Cut metal with a cold chisel. . . . . E-4 E-4 -
- .06 Select the proper saw blades for handsaws and power saws, and saw metal structural shapes, sheets and pipe. . . . . E-4 E-4 -
- .07 Select and use drills, machine and pipe taps and dies, and pipe reamers. . . . . E-4 E-4 -
- .08 Make single right-angle bend in sheet metal with wooden mallet. . . . . E-4 E-4 -
- .09 Drill holes, set, peen, and head rivets in sheet metal and plate . . . . . E-4 E-4 -
- .10 Cut sheet metal with slitting shears. . . . . E-4 E-4 -
- .11 Cut circular gaskets to dimensions with a gasket cutter . . . . . E-4 E-4 -
- .12 Operate a pipe-threading machine. . . . . E-4 E-4 -
- .13 Select and use hand threading dies and stocks for threading bolt stock and pipe . . . . . E-4 E-4 -

2.00 Examination Factors

- .01 Specific differences between Unified National Threads, Acme Threads and National Standard Pipe Threads. . . . . E-4 E-4 -
- .02 Characteristics of cutting edges on hot and cold chisels. . . . . E-4 E-4 -

C. IDENTIFICATION TESTS AND MARKINGS

1.00 Practical Factors

- .01 Identify various metals and metal alloys by use of acid etching, chip, spark and torch tests. . . . . E-4 E-4 -
- .02 Identify common structural steel shapes . . . . . E-4 E-4 -
- .03 Identify pipe, tubing and fittings by sizes . . . . . E-4 E-4 -
- .04 Identify valves and materials by using the standard marking system developed by the Manufacturers' Standardization Society (MSS) of the valves and fittings industry . . . . . E-4 E-4 -

2.00 Examination Factors

- .01 Use of continuous identification marking system and color marking system for identification of ferrous and nonferrous and nonferrous products . . . . . E-4 E-4 -
- .02 Identification of the following compressed gas cylinders by standard markings: acetylene, argon, carbon dioxide, helium, hydrogen and oxygen. Observe safety precautions for handling, stowage and maintenance of cylinders. . . . . E-4 E-4 -



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SF SFM SFP

D. CAPABILITIES TESTS

1.00 Practical Factors

.01	Conduct compartment and tank air tests for tightness. . . . .	E-4	E-4	-
.02	Make hydrostatic tests on shop repaired pipes, valves and fittings. . . . .	E-4	E-4	-
.03	Conduct gas free and oxygen tests on a void or compartment for safe entry and for safe hot-work. . . . .	E-4	E-4	-
.04	Prepare for and make the following tests and inspections using current approved methods and equipment as available:			
a.	File hardness . . . . .	E-4	E-4	-
b.	Free bend . . . . .	E-4	E-4	-
c.	Guided bend . . . . .	E-4	E-4	-
d.	Liquid penetrant. . . . .	E-4	E-4	-
e.	Magnetic particle . . . . .	E-4	E-4	-
.80	Make required inspections and tests on repaired piping and equipment . . . . .	-	-	E-7
.81	Interpret, plot and record results obtained from tests and inspections of metals . . . . .	-	-	E-7

2.00 Examination Factors

.60	Standard metal hardness test, and equipment used. . . . .	-	-	E-6
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E. LAYING OUT, ASSEMBLING, INSTALLING AND MAINTAINING

1.00 Practical Factors

.01	Replace and maintain gaskets and adjust dogs on watertight door, ports and hatches . . . . .	E-4	E-4	-
.02	Install insulation on ventilation ducts and bulkheads, including stud welding of insulation pins . . . . .	E-4	-	-
.03	Layout, cut, prepare joints and fabricate the following from sheet metal: funnels, 45° and 90° ells, and tees . . . . .	E-4	-	-
.04	Prepare wire templates for a piping section and prepare wood or metal targets. . . . .	E-4	E-4	-
.05	Operate, maintain and repair fixed foam system. . . . .	E-4	E-4	-
.40	Fabricate elbows, vent ducts, square-to-round transitions, and off-set transitions by assembling round vent ducts with groove and burr seams, and assemble rectangular ducts with lap seams, Pittsburgh locks and groove seams . . . . .	E-5	-	-
.41	Make a lift template for a bulkhead patch . . . . .	E-5	-	-
.42	Make temporary repairs to metal structures. . . . .	E-5	E-5	-
.43	Lay out flanges (any number holes and sizes) in relation to pitch circle and pitch chord (outside and inside diameter) . .	-	E-5	-
.44	Lay out and fabricate pipe and tubing by bending, mitering, and notching, working from wire templates and targets . . . . .	-	E-5	-
.45	Use plastic patch kit for emergency repairs to piping and tubing, observing safety precautions. . . . .	-	E-5	-

2.00 Examination Factors

.01	Adjusting and clamping procedures used to make angle bends in sheet metal. . . . .	E-4	-	-
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QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SF SFM SFP

E. LAYING OUT, ASSEMBLING, INSTALLING AND MAINTAINING - Continued

2.00 Examination Factors - Continued

.40	Maintenance of heating and ventilation ducts. . . . .	E-5	-	-
.41	Types of seams used in metalworking . . . . .	E-5	-	-
.60	Methods to verify estimates, and to schedule and approve procedures used in accomplishing assemblies, installations and/or repairs. . . . .	-	-	E-6

F. HEAT TREATING AND FORGING

1.00 Practical Factors

.01	Fill, light-off, secure and stow a Hauck burner . . . . .	E-4	E-4	-
.02	Select material and make a pipe hanger and a bracket. . . . .	E-4	E-4	-
.40	Forge metal links, pad-eyes and chisels . . . . .	E-5	E-5	-
.41	Preheat, postheat, and stress-relieve metals. . . . .	E-5	E-5	-
.42	Light-off gas and electric heat-treating ovens and furnaces . . .	E-5	E-5	-
.60	Anneal, harden, quench and temper carbon steel tools or parts . .	-	-	E-6

2.00 Examination Factors

.01	Case-hardening and its uses . . . . .	E-4	-	-
.02	Tools and procedures in forging metals. . . . .	E-4	-	-

G. BLUEPRINTS, DRAWINGS AND SKETCHES

1.00 Practical Factors

.01	Work from shop drawings and sketches:			
	a. Metalwork . . . . .	E-4	-	-
	b. Pipework. . . . .	-	E-4	-
.40	Interpret and work from mechanical drawings and blueprints. . . .	E-5	-	-
.41	Prepare sketches and drawings for metalwork and pipework. . . . .	E-5	E-5	-

2.00 Examination Factors

.40	Identification of the following from mechanical, structural and piping drawings:			
	a. Length, width and diameter of items shown on drawings . . . . .	E-5	E-5	-
	b. Hidden line, center line and dimension line . . . . .	E-5	E-5	-
	c. Diameter of holes . . . . .	E-5	E-5	-
	d. Depth of holes. . . . .	E-5	E-5	-
	e. Scale of drawings . . . . .	E-5	E-5	-
	f. Relationship between front, right side and top projection views . . . . .	E-5	E-5	-
	g. Tolerances. . . . .	E-5	E-5	-

H. STEAM FITTING AND PLUMBING

1.00 Practical Factors

.01	Identify the following pipe and tubing fittings by types, size, material, and pressure-temperature rating: couplings, ells, tees, reducers, bushings, unions and flanges. . . . .	E-4	E-4	-
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QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SF SFM SFP

H. STEAM FITTING AND PLUMBING - Continued

1.00 Practical Factors - Continued

.02	Disassemble and essemble piping sections and applicances, observing safety precautions. . . . .	E-4	E-4	-
.03	Use suction cup and snake to clear piping and plumbing lines. . .	E-4	E-4	-
.04	Make temporary repairs to piping systems. . . . .	E-4	E-4	-
.05	Cut and install low-pressure gaskets. . . . .	E-4	E-4	-
.06	Install flared fittings on tubings. . . . .	E-4	E-4	-
.07	Remove a broken stud. . . . .	E-4	E-4	-
.08	Use various sizes of spun glass tape to wrap insulation material on piping and ventilation systems. . . . .	E-4	E-4	-
.09	Measure, cut, install, lace and sew asbestos covering on piping insulation and ventilation systems . . . . .	E-4	E-4	-
.10	Repair and patch pipe lagging and insulation on steam, water, and refrigeration lines and ventilation systems . . . . .	E-4	E-4	-
.11	Isolate sections of piping systems. . . . .	E-4	E-4	-
.12	Install bends, loops and joints in piping systems, allowing for contraction and expansion . . . . .	E-4	E-4	-
.39	Maintain and make repairs to the following:			
a.	Gravity drains. . . . .	E-4	E-4	-
b.	Glove valves. . . . .	E-4	E-4	-
c.	Gate valves . . . . .	E-4	E-4	-
d.	Check valves. . . . .	E-4	E-4	-
e.	Faucets . . . . .	E-4	E-4	-
f.	Water closets . . . . .	E-4	E-4	-
g.	Fire main system. . . . .	E-4	E-4	-
h.	Flushing system . . . . .	E-4	E-4	-
i.	Flushometers. . . . .	E-4	E-4	-
j.	Salt- and fresh-water lines . . . . .	E-4	E-4	-
k.	Low-pressure air piping . . . . .	E-4	E-4	-
l.	Pressure reducing valves. . . . .	E-5	E-5	-
m.	Constant and intermittent steam piping. . . . .	E-5	E-5	-
n.	Steam traps . . . . .	E-5	E-5	-
o.	Hydraulic control valves. . . . .	E-5	E-5	-
p.	Fuel piping . . . . .	E-5	E-5	-
q.	High-pressure steam piping. . . . .	E-5	E-5	-
.40	Install high-pressure gaskets and flanges . . . . .	E-5	E-5	-
.41	Cover valves, fittings and bends with insulation materials. . . .	-	E-5	-

2.00 Examination Factors

.01	Common permanent types of lagging and insulating materials used, and their purpose . . . . .	E-4	E-4	-
.02	Types of gaskets used for low-pressure systems. . . . .	E-4	E-4	-
.03	Purpose and operating principles of:			
a.	Constant and intermittent steam piping. . . . .	E-4	E-4	-
b.	Steam traps . . . . .	E-4	E-4	-
c.	Hydraulic control valves. . . . .	E-4	E-4	-
d.	Pressure reducing valves. . . . .	E-4	E-4	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
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H. STEAM FITTING AND PLUMBING - Continued

2.00 Examination Factors - Continued

.04	Types of pumps used in various systems. . . . .	E-4	E-4	-
.05	Characteristics of, and normal working pressures for, gases and liquids carried by piping systems aboard ship . . . . .	E-4	E-4	-
.40	Main characteristics of shipboard piping systems, procedures for repairing, and safety precautions to be observed in making repairs . . . . .	E-5	E-5	-
.41	Types of gaskets for systems operating at high pressure and at high temperatures. . . . .	E-5	E-5	-
.42	Standards requirements for repairs to high-pressure (P-1) piping. . . . .	E-5	E-5	-
.43	Proper base and welding materials for repairs to high-pressure (P-1) piping . . . . .	E-5	E-5	-

I. MEASURING AND MEASURING DEVICES

1.00 Practical Factors

.01	Use dividers, protractors, and inside-outside calipers and rules . . . . .	E-4	E-4	-
.02	Determine pitch of inside and outside threads, using a screw pitch gage or steel rule. . . . .	E-4	E-4	-
.03	Determine size of wire and thickness of sheet metal, using a micrometer caliper, sheet metal gage, and wire gage . . . . .	E-4	E-4	-
.04	Compute gallons of water in a given tank; convert fractions to thousandths. . . . .	E-4	E-4	-
.40	Compute weight of piping and tubing . . . . .	E-5	E-5	-

2.00 Examination Factors

.01	Arithmetic used to solve problems involving areas and volumes . .	E-4	E-4	-
.40	Weight computation of steel plates and sheet metal structures . .	E-5	E-5	-

J. DAMAGE CONTROL

1.00 Practical Factors

.01	Locate and identify compartments using standard compartment numbering system. . . . .	E-4	E-4	-
.39	Operate the following damage-control equipment:			
	a. CO <sub>2</sub> fixed system. . . . .	E-4	E-4	-
	b. Duplex proportioner and/or water motor proportioner . . . . .	E-4	E-4	-
	c. Submersible pump. . . . .	E-4	E-4	-
	d. P-250 pump. . . . .	E-4	E-4	-
	e. P-500 pump. . . . .	E-4	E-4	-
	f. Hose (air-line) mask. . . . .	E-4	E-4	-
	g. Asbestos suit . . . . .	E-5	E-5	-
	h. Radiac instruments. . . . .	E-5	E-5	-
.40	Shore bulkhead and hatch. . . . .	E-5	E-5	-
.41	Locate pumps, cross-connections, fireplugs, and principal isolation valves of damage control systems. . . . .	E-5	E-5	-
.60	Work from blueprints and diagrams to estimate degree of damage and corrective measures to be taken . . . . .	-	-	E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
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J. DAMAGE CONTROL - Continued

1.00 Practical Factors - Continued

- .61 Evaluate flooding situation, determine corrective measures to be taken, and the types and numbers of pumps and dewatering equipment to be used . . . . . - - E-6
- .62 Take charge of a fire party and a repair party. . . . . - - E-6
- .63 Drill repair party in the use and operation of damage control equipment . . . . . - - E-6
- .64 Plan, supervise and conduct a damage-control exercise . . . . . - - E-6

2.00 Examination Factors

None.

K. SAFETY

1.00 Practical Factors

- .01 Demonstrate proper method of using oxygen-breathing apparatus (OBA) . . . . . E-4 E-4 -
- .40 Conduct atmospheric test of spaces where it is necessary to perform hot work within, and hot work on, space pressed up with - or in way of materials concerned. (See Department of the Navy Safety Precautions for Shore Activities (NAVSO P-2455) and BuShips Manual, Chapter 92, Section VI.) . . . . . E-5 E-5 -
- .41 Enforce personnel and material safety precautions on assigned jobs. . . . . E-5 E-5 -

2.00 Examination Factors

- .01 Hazards of welding and cutting near inflammables, explosives and closed or poorly ventilated spaces. . . . . E-4 E-4 -
- .02 Safety precautions and procedures required before and during welding operations performed outside the shop . . . . . E-4 E-4 -
- .03 Safety precautions to be observed when handling fluxes. . . . . E-4 E-4 -
- .04 Safety precautions to be observed before, during and after using portable electric and pneumatic drills, and grinders. . . . . E-4 E-4 -
- .05 Safety precautions to be observed before and during grinding operations. . . . . E-4 E-4 -
- .06 Safety precautions to be observed when using and storing oxygen-breathing apparatus (OBA) and canisters . . . . . E-4 E-4 -
- .07 Safety precautions necessary for care and stowage of a blow torch . . . . . E-4 E-4 -
- .08 Safety precautions to be observed when cutting steel cable. . . . . E-4 E-4 -
- .80 Effect of repairs on ship's characteristics, such as water-tight integrity, stability and weight and moment. . . . . - - E-7
- .81 Safety precautions to be observed as set forth in Department of the Navy Safety Precautions for Shore Activities (NAVSO P-2455) and BuShips Manual, Chapter 92, Section V . . . . . - - E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SF SFM SFP

L. ADMINISTRATION

1.00 Practical Factors

- .60 Locate and use appropriate sections of BuShips Technical Manual, manufacturers' technical manuals, mechanical drawings, and handbooks to obtain data when making repairs. . . . - - E-6
- .61 Supervise stowage and preservation of, and accounting for, plumbing and piping materials . . . . . - - E-6
- .62 Supervise stowage and preservation of, and accounting for, stores and repair parts . . . . . - - E-6
- .80 Keep shop records and prepare shipyard and tender work requests . - - E-7
- .81 Organize, supervise and train personnel in maintenance and repair duties . . . . . - - E-7
- .82 Estimate time, personnel and materials needed for repairs . . . . - - E-7

2.00 Examination Factors

- .60 Procedures for obtaining replacement parts and supplies . . . . . - - E-6
- .61 Uses of allowance lists for repair parts, tools and supplies. . . - - E-6
- .80 Records kept by the repair department: work requests, job orders and progress reports . . . . . - - E-7

TELEPHONE TECHNICIAN (TT)

GENERAL RATING

SCOPE

Telephone Technicians install, operate, maintain and repair all types of wire connected communications and terminal equipment including telephone, telegraph, carrier systems, teletype equipment, PEX exchanges, switchboards, public address systems, interoffice and intraship communications systems; place and splice aerial, underground and submarine cable. Survey locations for and construct pole line and cable plant, contact general public relative to right-of-way, make estimates for construction projects and supervise such projects. Install antennas and antenna ground systems.

SERVICE RATINGS (PO3 and PO2)

SCOPES

TELEPHONE TECHNICIAN I (Inside) - TTI

Telephone Technicians (I) maintain and repair all inside telephone, telegraph equipment, switchboards, interoffice communications systems and other associated equipment which is normally located within structures.

TELEPHONE TECHNICIAN O (Outside) - TTO

Telephone Technicians (O) deal with all types of equipment found in the general rating of Telephone Technician that are maintained and repaired outside such as: telephone poles, telephone lines, submarine cables and other associated equipment.

QUALIFICATIONS FOR ADVANCEMENT

Required for Advancement to TT TTI TTO

A. THEORY OF ELECTRONICS

1.00 Practical Factors

None.

2.00 Examination Factors

.01	Relation of current, voltage and impedance in a.c. circuits. . . . .	E-4	E-4	E-4
.02	Relation of reluctance, flux and magnetomotive force in a.c. and d.c. circuits . . . . .	E-4	E-4	E-4
.03	Relation of resistance, temperature and current in electrical conductor. . . . .	E-4	E-4	E-4
.04	Relation of length and cross-sectional area to resistance of a conductor. . . . .	E-4	E-4	E-4
.05	Function, operating principles and construction of:			
	a. Electron, gas-filled and cathode ray tubes . . . . .	E-4	E-4	E-4
	b. Transistors and diodes . . . . .	E-4	E-4	E-4

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
TT TTI TTO

**A. THEORY OF ELECTRONICS - Continued**

**2.00 Examination Factors - Continued**

.06	Methods of coupling amplifier stages. . . . .	E-4	E-4	E-4
.39	Meaning of:			
	a. Conductor and insulator, magnetic lines of force, field intensity, flux density, permeability, ampereturn, hysteresis and eddy current, self- and mutual-induction, and electromagnetic induction . . . . .	E-4	E-4	E-4
	b. Coulomb, volt, ampere, ohm, circular mil, farad and watt. . . . .	E-4	E-4	E-4
	c. Horsepower, power factor and volt-ampere. . . . .	E-4	E-4	E-4
	d. Reactance, capacitance, inductance and impedance. . . . .	E-4	E-4	E-4
	e. Torque, frequency, cycle, phase and pulse . . . . .	E-4	E-4	E-4
	f. Amplifier . . . . .	E-4	E-4	E-4
	g. Micro, kilo and mega as applied to any of the above units of measure. . . . .	E-4	E-4	E-4
	h. Gain. . . . .	E-4	E-4	E-4
	i. Attenuation, absorption, conductance, modulation and demodulation. . . . .	E-4	E-4	E-4
	j. Detection, selectivity and sensitivity, filter intermediate frequency, heterodyne, resonance, nonlinear, sideband, zero beat and AGC. . . . .	E-4	E-4	E-4
	k. Feedback, bias and cutoff . . . . .	E-5	E-5	-
	l. Plate current and grid current. . . . .	E-5	E-5	-
	m. Electron tube characteristics and transistor characteristics. . . . .	E-5	E-5	-
	n. Phase distortion and amplitude. . . . .	E-5	E-5	-
.40	Characteristics and use of synchroamplifiers; purpose of gain, feed and balance adjustments. . . . .	E-5	E-5	-
.41	Calculate current, voltage, phase angle, impedance and resonance in a.c. series and parallel circuits containing not more than four elements . . . . .	E-5	E-5	-
.60	Operating principles of basic meters and meter movements employing:			
	a. D'Arsonval and electrodynamic meter movements . . . . .	E-6	-	-
	b. Shunts and multipliers. . . . .	E-6	-	-
	c. Thermocouples and rectifiers in a.c. meters . . . . .	E-6	-	-
.61	Meaning of meter sensitivity and effect of circuit loading. . . . .	E-6	-	-
.62	Computations required to determine size of shunts and multipliers . . . . .	E-6	-	-

**B. MATERIALS AND EQUIPMENT**

**1.00 Practical Factors**

.01	Select, use and maintain telephone technician's common hand and small bench tools, including soldering equipment and electric powered tools, such as drills and grinders provided for maintenance and repair of IC equipment. . . . .	E-4	E-4	E-4
.02	Inspect, maintain, test, and install storage and dry cell batteries . . . . .	E-4	E-4	-
.03	Use voltmeter, ammeter and ohmmeter in testing circuits and equipment . . . . .	E-4	E-4	E-4
.04	Interpret color coding of capacitors, resistors, internal connections of power and audio transformers, and chassis wiring. . . . .	E-4	E-4	E-4



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TT TTI TTO

B. MATERIALS AND EQUIPMENT - Continued

1.00 Practical Factors - Continued

.01	Select, use and maintain telephone technician's common hand and small bench tools, including soldering equipment and electric powered tools, such as drills and grinders provided for maintenance and repair of IC equipment . . . . .	E-4	E-4	E-4
.02	Inspect, maintain, test and install storage and dry cell batteries. . . . .	E-4	E-4	-
.03	Use voltmeter, ammeter and ohmmeter in testing circuits and equipment. . . . .	E-4	E-4	E-4
.04	Interpret color coding of capacitors, resistors, internal connections of power and audio transformers, and chassis wiring. . . . .	E-4	E-4	E-4
.05	Identify commonly used telephone pole line, hardware, cable and telephone equipment. . . . .	E-4	E-4	E-4
.40	Inspect extension cords and portable power and bench tools for proper connections and continuity of grounding circuits. . . . .	E-5	E-5	E-5
.60	Effect authorized field changes to IC equipment. . . . .	E-6	-	-

2.00 Examination Factors

.01	Nomenclature and use of tools, materials and equipment related to:			
	a. Electric motors and generators . . . . .	E-4	E-4	E-4
	b. Wire communication systems . . . . .	E-4	E-4	E-4
	c. Interior and exterior wiring systems . . . . .	E-4	E-4	E-4
.02	Care and storage of telephone materials. . . . .	E-4	E-4	E-4
.03	Types, structure and electrical characteristics of batteries . . . . .	E-4	E-4	E-4
.04	EIA color coding systems for: fixed capacitors and resistors, AF, power, and IF transformer connections. . . . .	E-4	E-4	-
.39	Construction and operation of:			
	a. Amplifier announcing systems . . . . .	E-4	E-4	-
	b. Automatic telephones . . . . .	E-5	E-5	-
.40	Types and functions of measuring and testing equipment and devices used in electronic maintenance . . . . .	E-5	E-5	E-5
.41	Principle of operation of Wheatstone bridge and cable fault finders. . . . .	E-5	E-5	E-5

C. MAINTENANCE

1.00 Practical Factors

.01	Make tests for, locate and clear short and open circuits and grounds in cables, wirings and fittings. . . . .	E-4	E-4	E-4
.02	Inspect, clean and lubricate telephone and IC equipment in accordance with preventive maintenance requirements. . . . .	E-4	E-4	E-4
.03	Calculate current, voltage and resistance in d.c. series and parallel circuits. . . . .	E-4	E-4	E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TT TTI TTO

C. MAINTENANCE - Continued

1.00	Practical Factors - Continued			
.04	Use and perform preventive maintenance on the following test equipment:			
	a. Non-electronic volt-ohm-ammeter . . . . .	E-4	E-4	E-4
	b. Electronic volt-ohm-ammeter . . . . .	E-4	E-4	E-4
	c. Tube tester . . . . .	E-4	E-4	E-4
	d. Megger. . . . .	E-4	E-4	E-4
	e. Oscilloscope. . . . .	E-4	E-4	E-4
	f. Signal generator. . . . .	E-4	E-4	E-4
.05	Operation of motor vehicles and motorized equipment, and demonstrate sufficient knowledge of gasoline engines to make minor repairs to same. . . . .	E-4	-	E-4
.06	Tune, adjust and interconnect radio, teletype and cryptographic equipment in a RATT system. . . . .	E-4	E-4	-
.07	Climb and perform work upon poles and towers such as stringing wire, tying-in, etc . . . . .	E-4	-	E-4
.08	Make operational adjustments to teletypewriters and interchange components of teletype systems to restore operation . . . . .	E-4	E-4	-
.39	Localize casualties and perform corrective maintenance on the following:			
	a. Cables, wiring and fittings . . . . .	E-4	E-4	E-4
	b. Sound-powered handsets and headsets . . . . .	E-4	E-4	E-4
	c. Intercoms and portable announcing systems . . . . .	E-5	E-5	E-5
	d. Motor-generator sets and control panels as applied to IC equipment . . . . .	E-5	E-5	-
	e. Central amplifier systems . . . . .	E-5	E-5	-
	f. Sound-powered telephone circuits. . . . .	E-5	E-5	E-5
	g. Automatic telephones. . . . .	E-5	E-5	-
.40	Test, repair, and/or replace parts such as relays, plugs, lamps, fuses, switches, tubes, jacks, cable, wiring, fixed capacitors, variacs, transformers, fixed resistors and potentiometers within a component, assembly or subassembly. . . . .	E-5	E-5	E-5
.41	Tighten connections on switchboards and control panels. . . . .	E-5	E-5	-
.42	Localize applicable equipment casualties to parts in accordance with instructions and diagrams . . . . .	E-5	E-5	-
.60	Perform sensitivity and selectivity measurements and align circuits as necessary for optimum performance of electronic equipment . . . . .	E-6	-	-
.61	Use properly: capacity unbalance set, transmission sets, teletype and telegraph equipment test sets and relay test sets, used by the Coast Guard . . . . .	E-6	-	-
.62	Overhaul teletypewriter and telegraph equipment . . . . .	E-6	-	-
.63	Perform minor maintenance on radio link equipment . . . . .	E-6	-	-
.64	Test, remove and install meters and instrument transformers . . . . .	E-6	-	-
.80	Test and evaluate new or overhauled components, assemblies or subassemblies of IC equipment for proper and secure installation and optimum performance. . . . .	E-7	-	-
.81	Analyze and evaluate electrical and electronic tests; make adjustments, calibrations and repairs for optimum performance of telephone and IC equipment . . . . .	E-7	-	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TT TTI TIO

C. MAINTENANCE - Continued

1.00 Practical Factors - Continued

- .82 Conduct periodic inspections and internal adjustments of telephone and IC units as indicated within current preventive maintenance requirements . . . . . E-7 - -
- .83 Conduct tests to prove electrical and magnetic radiation security of cryptographic systems . . . . . E-7 - -

2.00 Examination Factors

- .01 Lubricants, cleaning materials and solutions used in the maintenance of telephone and IC equipment . . . . . E-4 E-4 E-4
- .02 Procedures for replacing:
  - a. Electron tubes. . . . . E-4 E-4 E-4
  - b. Transistors and solid state diodes. . . . . E-4 E-4 E-4
- .03 Describe functions and inputs and outputs of Blocks of Block diagrams of applicable equipment. . . . . E-4 E-4 -
- .04 Function of the following test equipment:
  - a. Electronic and nonelectronic multimeter . . . . . E-4 E-4 -
  - b. Tube tester . . . . . E-4 E-4 -
  - c. Oscilloscope. . . . . E-4 E-4 -
  - d. Capacitance-inductance-resistance bridge. . . . . E-4 E-4 -
  - e. AF signal generator . . . . . E-4 E-4 -
  - f. Megger. . . . . E-4 E-4 -
- .05 Methods and equipment used in electrical tests for continuity, grounds and short circuits. . . . . E-4 E-4 E-4
- .06 Method of soldering and soldering equipment used in maintenance and repair of electronic equipment. . . . . E-4 E-4 E-4
- .39 Function and operating principles of:
  - a. Audio amplifiers. . . . . E-4 E-4 -
  - b. Coaxial transmission lines and cables . . . . . E-4 E-4 E-4
  - c. Rectifiers, copper oxide, selenium crystal, electron tube. . . . . E-5 E-5 -
  - d. Modulators, grid, screen, plate . . . . . E-5 E-5 -
  - e. Video amplifiers. . . . . E-6 - -
  - f. AGC circuits. . . . . E-6 - -
- .60 Interpret specific telephone system specifications. . . . . E-6 - -
- .61 Describe function of teletypewriter components. . . . . E-6 - -
- .62 Describe methods of cable fault locations, capacitive unbalance testing and cable splicing. . . . . E-6 - -
- .63 Methods of performing sensitivity and selectivity measurements and aligning circuits for optimum performance of electronic equipment . . . . . E-6 - -
- .80 Effects of environmental conditions upon operation of electronic and electrical equipment and special maintenance techniques involved for equipment to be operated at extremes of temperature and humidity . . . . . E-7 - -

QUALIFICATION FOR ADVANCEMENT

Required for  
Advancement to  
TT TTI TIO

D. CABLES, CIRCUITS AND SWITCHBOARDS

1.00 Practical Factors

.01	Make electrical connections and splices, including soldered joints and pressure-type terminals (solderless type) . . . . .	E-4	E-4	E-4
.02	Test telephone and IC circuits that are external to major units of equipment for continuity, short circuits, and grounds; measure electrical quantities such as voltage, current and power, and compare with established values. . . . .	E-4	E-4	E-4
.40	Test internal circuits of major units of telephone and IC equipment for continuity, short circuits and grounds; measure electrical quantities such as voltage, current, and power, and compare with established values; use an oscilloscope to view circuit waveforms and compare with established optimum performance waveforms required in equipment . . . . .	E-5	E-5	-
.41	Check pole lines and cables for conformity with specifications and plans. . . . .	E-5	-	E-5
.42	Demonstrate knowledge of circuit application such as simplex telegraph circuits and phantom telephone circuits. Splice, install and pull wire through conduit. Bend and install conduit as required . . . . .	E-5	E-5	E-5
.60	Install antennas and ground systems in accordance with plans. . .	E-6	-	-

2.00 Examination Factors

.01	Methods of obtaining three general types of bias: fixed, cathode and grid leak . . . . .	E-4	E-4	-
.02	Function of circuit components, such as:			
a.	Resistors . . . . .	E-4	E-4	E-4
b.	Rheostats . . . . .	E-4	E-4	E-4
c.	Potentiometers. . . . .	E-4	E-4	E-4
d.	Solenoids . . . . .	E-4	E-4	-
e.	Inductors . . . . .	E-4	E-4	-
f.	Capacitors. . . . .	E-4	E-4	E-4
g.	Fuses . . . . .	E-4	E-4	E-4
h.	Switches. . . . .	E-4	E-4	E-4
i.	Transformers. . . . .	E-4	E-4	E-4
j.	Relays. . . . .	E-4	E-4	E-4
.60	Methods and procedures for overhaul of switchboards . . . . .	E-6	-	-

E. COMMUNICATION SYSTEMS

1.00 Practical Factors

.01	Work as crew member erecting pole lines and accessories and installing underground telephone cable. . . . .	E-4	-	E-4
.02	Service and charge storage batteries used in wire communication systems . . . . .	E-4	E-4	E-4
.03	Make repairs to telephone wiring, subsets and signal circuits. . . . .	E-4	E-4	E-4
.04	Install storage and dry cell batteries used for wire communication systems . . . . .	E-4	E-4	E-4
.05	Operate and service, manual telephone switchboards. . . . .	E-4	E-4	E-4

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
TT TTI TIO

**E. COMMUNICATION SYSTEMS - Continued**

**1.00 Practical Factors - Continued**

.40	Install interior telephone wiring, subsets, signal circuits, public address systems and interoffice communication systems . . . .	E-5	E-5	-
.41	Locate, analyze and correct interior and exterior circuit faults, and make major repairs to signal, telephone, public address, and interoffice communication systems . . . . .	E-5	E-5	-
.42	String overhead telephone lines and install underground telephone cable. . . . .	E-5	-	E-5
.43	Splice overhead and underground cable; splice-in telephone cable terminals. . . . .	E-5	-	E-5
.44	Repair manual telephone switchboards . . . . .	E-5	E-5	-
.60	Lay out telephone plant, transposition plans, telephone distribution systems, intercommunication and public address systems . . . . .	E-6	-	-

**2.00 Examination Factors**

.01	Types of manual and automatic telephone equipment. . . . .	E-4	E-4	E-4
.40	Principles of electrical theory as applied to wire communication systems. . . . .	E-5	E-5	E-5

**F. DRAWINGS AND SKETCHES**

**1.00 Practical Factors**

.01	Read and prepare elementary wiring diagrams to perform tasks on:			
	a. Interior wiring systems. . . . .	E-4	E-4	-
	b. Wire communication systems . . . . .	E-4	E-4	E-4
.02	Interpret electric, electronic and mechanical symbols shown in schematic and wiring diagrams, technical-maintenance publications and installation blueprints. . . . .	E-4	E-4	E-4
.40	Use electrical plans, diagrams and schematics to install or repair:			
	a. Interior wiring. . . . .	E-5	E-5	-
	b. Wire communication systems . . . . .	E-5	E-5	E-5
.60	Prepare sketches, employing conventional electrical symbols. . . . .	E-6	-	-
.61	Prepare diagrams and sketches of devices and equipment, using standard designations for cables, wiring, terminal markings, circuit components, and line record data forms . . . . .	E-6	-	-

**2.00 Examination Factors**

.01	Electrical symbols used on wiring diagrams and schematics. . . . .	E-4	E-4	E-4
.60	Purpose of Block diagrams of systems such as transmitters, receivers and radiobeacons in common use at Coast Guard stations, light stations and their boats . . . . .	E-6	-	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TT TTI TFO

G. SAFETY

1.00 Practical Factors

- .01 Perform the following (under simulated conditions):
  - a. Rescue of a person in contact with an energized circuit . . . E-4 E-4 E-4
  - b. Resuscitation of a person unconscious from electric shock . . E-4 E-4 E-4
  - c. First aid treatment for electric shock and burns  
and chemical burns. . . . . E-4 E-4 E-4
  - d. Pole-top resuscitation. . . . . E-4 - E-4

2.00 Examination Factors

- .01 Safety precautions to be observed when working with or in the vicinity of electric circuits and equipment . . . . . E-4 E-4 E-4
- .02 Safety precautions to be observed when:
  - a. Handling molten lead, compound and taping oil used  
in splicing . . . . . E-4 - E-4
  - b. Climbing poles, buildings and towers to string or work  
with wires and cables . . . . . E-4 - E-4
  - c. Charging batteries. . . . . E-4 E-4 E-4

H. WATCHSTANDING

1.00 Practical Factors

- .01 Stand watch on Loran stations after receiving watchstander training. . . . . E-4 - -
- .40 Stand Electronics watch on High Endurance Vessels. Observe performance of equipments and in case of minor equipment defects, restore by replacement of plug-in components or modules. Recognize more serious problems and call to attention of applicable rate and assist in repair. . . . . E-5 - -

2.00 Examination Factors

- .01 Purpose of operator's control and adjustments on:
  - a. Receiver gain . . . . . E-4 E-4 -
  - b. Transmitter tuning. . . . . E-4 E-4 -
  - c. Antenna tuning. . . . . E-4 E-4 -
  - d. Loran indicator sweep speed switch. . . . . E-4 E-4 -
  - e. Loran indicator course and fine delay . . . . . E-4 E-4 -

I. ADMINISTRATION, SUPERVISION AND TRAINING

1.00 Practical Factors

- .01 Prepare requisitions for tools and replacement parts. . . . . E-4 E-4 E-4
- .02 Set up public address systems . . . . . E-4 E-4 E-4
- .03 Locate in technical and maintenance publications information necessary for maintenance and repair of electronic equipment; enter corrections to publications when changes are made . . . . E-4 E-4 -
- .04 Take, record and report inventories of tools and portable test equipment available for maintenance and repair of electronic equipment. . . . . E-4 E-4 E-4
- .05 Gather information for and prepare complete entries in electronic equipment failures reports . . . . . E-4 E-4 E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TT TTI TTO

I. ADMINISTRATION, SUPERVISION AND TRAINING - Continued

1.00 Practical Factors - Continued

.60	Prepare inspection and progress reports, job orders and material requisitions; stow and account for spare parts . . . . .	E-6	-	-
.61	Make equipment and material estimates from drawings, sketches and specifications. . . . .	E-6	-	-
.62	Use properly: installation handbooks, Western Electric Co., J, H, ED, SD, ES and T drawings applicable to telephone equipment . . . . .	E-6	-	-
.80	Instruct personnel in practical application of a.c. and d.c. theory. . . . .	E-7	-	-
.81	Conduct training programs to qualify personnel for advancement in rating, including cross-training of service personnel for advancement to the general rating . . . . .	E-7	-	-
.82	Train individuals and drill crews in safe and expeditious execution of assigned tasks . . . . .	E-7	-	-
.83	Direct and coordinate composition and efforts of crews. . . . .	E-7	-	-
.84	Estimate time, materials and labor required for repair of telephone and IC systems and equipment. . . . .	E-7	-	-
.85	Supervise and train personnel in installation, operation, maintenance and repair of telephone and IC equipment to meet installation specifications and Technical Manual performance standards . . . . .	E-7	-	-

2.00 Examination Factors

.01	"AN" letter designations for electronic equipment . . . . .	E-4	E-4	E-4
.02	Types of entries and information required in reports and records concerning performance and maintenance of telephone and IC equipment. . . . .	E-4	E-4	E-4
.03	Types of information contained in electronic technical and maintenance publications. . . . .	E-4	E-4	E-4
.04	Procedures for taking, recording and reporting inventories of tools and portable test equipment used in maintenance and repair of electronic equipment. . . . .	E-4	E-4	E-4
.60	Principles and techniques of supervision and job control. . . . .	E-6	-	-
.61	Types of information reported in periodic or recurring reports concerning performance and/or maintenance of electronic equipment . . . . .	E-6	-	-
.80	Accounting procedures for equipment, maintaining control of inventories and workflow, and reporting equipment status and work accomplished . . . . .	E-7	-	-
.81	Types of information included in job orders and work requests . . . . .	E-7	-	-
.82	Methods, techniques, and devices applicable in electronic maintenance training of teams and individuals . . . . .	E-7	-	-
.83	Procedures for organizing and administering the maintenance and repair of electronic equipment. . . . .	E-7	-	-
.84	Current service directives on operational and maintenance responsibilities of enlisted personnel for electronic equipment . . . . .	E-7	-	-

★ SENIOR CHIEF TELEPHONE TECHNICIAN (TTCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TT

1.00 Practical Factors

- .90 Provide the command with technical information and advice concerning capabilities, limitations, reliability, and operation of shipboard/shore station intercommunications systems and all telephone and teletype communication systems used by the Coast Guard . . . . . E-8
- .91 Prescribe shop equipment to be used in testing, maintenance, and repair of intercommunications, telephone, and teletype equipment. . . . . E-8
- .92 Develop procedures for determining priority and expedite work requests submitted for maintaining intercommunications, telephone, and teletype equipment . . . . . E-8
- .93 Plan, organize, and direct work of personnel operating and maintaining intercommunications, telephone, and teletype equipment . . . . . E-8

2.00 Examination Factors

- .90 Nature and scope of information contained in pertinent technical manuals and publications . . . . . E-8

★ MASTER CHIEF TELEPHONE TECHNICIAN (TTCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Develop procedures and supervise practices and techniques for casualty analysis of intercommunications; telephone, and teletype equipment. . . . . E-9
- .96 Develop procedures for checking and evaluating defective and worn intercommunications, telephone, and teletype equipment . . . . . E-9
- .97 Collect, prepare, and disseminate technical information pertaining to test, maintenance, and repair of intercommunications, telephone, teletype, and associated equipment . . . . . E-9

2.00 Examination Factors

None.





CS



JO



MA



PC



PN



RM



SD



SH



SK



YN

# ADMINISTRATIVE AND CLERICAL GROUP IV

Commissaryman	CS
Investigator	IV
Intelligenceman	IX
Journalist	JO
Machine Accountant	MA
Postal Clerk	PC
Personnelman	PN
Radioman	RM
Steward	SD
Ship's Serviceman	SH
Storekeeper	SK
Yeoman	YN

## COMMISSARYMAN (CS)

### GENERAL RATING

#### SCOPE

Commissarymen serve as cooks and bakers for the general mess on ships and at shore stations; write menus; prepare food; assist in ordering subsistence items; check deliveries for quantity and inspect for quality; stow subsistence items; maintain cleanliness and sanitation of galley, bakeshop, food preparation, food service and refrigerated spaces, and subsistence issue rooms; and may serve in commissary stores as meatcutters.

#### SERVICE RATINGS

None.

#### QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
CS

##### A. FOOD PREPARATION

###### 1.00 Practical Factors

- |     |  |     |
|-----|--|-----|
| .01 | Prepare soups, vegetables, meats, salads, and desserts using Navy-Marine Corps Recipe Service . . . . .  | E-4 |
| .02 | Bake bread, pies, cakes, simple pastries and desserts using Navy-Marine Corps Recipe Service . . . . .   | E-4 |
| .03 | Cut meat for various uses in the mess and clean and prepare seafood and poultry (Does not include cutting of whole, halves, or quarters of carcasses.) . . . . . | E-4 |
| .40 | Prepare two of the more complex baked goods selected from the Navy-Marine Corps Recipe Service . . . . .   | E-5 |
| .41 | Carve meat and poultry for serving . . . . .   | E-5 |
| .60 | Plan tasks and use of galley equipment to meet mealtime schedules . . . . .  | E-6 |
| .61 | Supervise and train personnel in all phases of food preparation and service . . . . .  | E-6 |

###### 2.00 Examination Factors

- |     |   |     |
|-----|---|-----|
| .01 | Conversion by calculation quantities given in Navy-Marine Corps Recipe Service for 100 men into quantities required for groups of other sizes . . . . . | E-4 |
| .02 | Convert units of measure and define terms commonly used in recipes . . . . .  | E-4 |
| .03 | Uses of various types of boneless meats . . . . .   | E-4 |
| .04 | Uses of bones and fat trimmings from uncooked meats . . . . .   | E-4 |
| .05 | Procedures for handling, cutting and thawing frozen meat, seafood and poultry . . . . .   | E-4 |
| .06 | Names, location on the carcass and uses of various cuts of beef and veal . . . . .  | E-4 |
| .07 | Names and uses of the various cuts of pork generally available. . . . .   | E-4 |
| .40 | Grades of meat . . . . .  | E-5 |
| .41 | Methods of determining yield of meat, fat and bone of carcasses and cuts . . . . .  | E-5 |
| .60 | Percentages of various types of boneless meat delivered by packers for Coast Guard use . . . . .  | E-6 |

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
CS

B. UTENSILS AND EQUIPMENT

1.00 Practical Factors

- .01 Operate galley ranges, ovens and mechanical equipment used in the preparation of food . . . . . E-4
- .02 Operate bake shop equipment such as mixer and proof box . . . . . E-4
- .03 Operate galley meat cutting equipment . . . . . E-4
- .04 Operate scullery equipment . . . . . E-4
- .40 Perform operational maintenance on equipment used in galley, bake shop and scullery . . . . . E-5

2.00 Examination Factors

None.

C. SANITATION AND SAFETY

1.00 Practical Factors

- .01 Keep spaces and equipment in a clean and sanitary condition . . . E-4
- .02 Locate and use firefighting equipment in commissary spaces and storage compartments under simulated conditions . . . . . E-4
- .40 Supervise sanitation procedures in the general mess spaces . . . E-5

2.00 Examination Factors

- .01 Sanitary and safety precautions for the stowage, issue, preparation and service of food . . . . . E-4
- .02 Basic causes of food poisoning and precautions to be observed . . E-4
- .03 Methods and materials used in pest and rodent control . . . . . E-4
- .04 Safety precautions to be observed in the use of galley equipment . . . . . E-4
- .40 Sanitary and safety precautions for the care of the mess deck . . E-5
- .41 Food service precautions and measures necessary when exposed to NBC warfare . . . . . E-5

D. PROCUREMENT, STORAGE AND CONSERVATION OF SUBSISTENCE ITEMS

1.00 Practical Factors

- .01 Stow perishables and dry subsistence items in freeze boxes, chill boxes, subsistence issue rooms and bulk storerooms. . . . . E-4
- .60 Prepare plans for loading, unloading and stowage of subsistence items . . . . . E-6
- .61 Prepare estimates of subsistence requirements based on usage data . . . . . E-6
- .62 Supervise receipt, storage and issue of subsistence items . . . . E-6

2.00 Examination Factors

- .01 Stowage temperatures listed in the Comptroller Manual for various types of subsistence items . . . . . E-4
- .02 Regulations regarding movement of subsistence items within and from refrigerated spaces, bulk storerooms and subsistence issue rooms . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
CS

D. PROCUREMENT, STORAGE AND CONSERVATION OF SUBSISTENCE  
ITEMS - Continued

2.00 Examination Factors - Continued

- .03 Characteristics of spoiled food and procedures for survey . . . . E-4
- .40 Expected storage life of various classes of food under  
various conditions . . . . . E-5
- .41 Conservation and utilization of food to reduce waste . . . . . E-5
- .60 Procurement of subsistence items . . . . . E-6

E. MENUS

1.00 Practical Factors

- .60 Prepare menus for properly balanced diet and estimate quantities  
of food for a given number of men in accordance with the Normal  
Subsistence Requirements Table in the Comptroller Manual . . . . E-6
- .80 Make a nutritional analysis of a menu . . . . . E-7

2.00 Examination Factors

- .01 Basic classes of foods and the function of each in the diet . . . E-4
- .40 Functions and sources of vitamins and minerals . . . . . E-5
- .60 Procedures for computing the quantity of each item on the menu  
and the cost of a daily ration . . . . . E-6
- .61 Regulations regarding subsistence allowances and commuted  
rations . . . . . E-6

F. ADMINISTRATION

1.00 Practical Factors

- .60 Act as watch captain . . . . . E-6
- .61 Keep records of transactions connected with the general mess  
operation . . . . . E-6

2.00 Examination Factors

- .01 Organization of a general mess . . . . . E-4
- .60 Regulations and instructions governing operation of a  
general mess . . . . . E-6
- .61 Procedures for battle messing . . . . . E-6
- .62 Regulations and instructions governing flight meals and  
special rations . . . . . E-6
- .63 Uses and preparation of forms for administering a general mess. . E-6
- .80 Operation of the Defense Subsistence Supply Center procurement  
system and its relationship to individual ships and stations . . E-7
- .81 General organization and functions of the supply department  
including general supply, disbursing and officers' and chief  
petty officers' mess afloat . . . . . E-7

★ SENIOR CHIEF COMMISSARYMAN (CSCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement  
CS

1.00 Practical Factors

- .90 Exercise supervision over procurement, storage, and conservation of subsistence items . . . . . E-8
- .91 Train and supervise personnel in the preparation of balanced menus in accordance with applicable manuals and publications . . . . . E-8
- .92 Train and supervise personnel in the correct operation, cleaning, and maintenance of equipment located in food preparation spaces and the dining area . . . . . E-8
- .93 Instruct personnel in sanitary and safety precautions, conducting daily inspections . . . . . E-8
- .94 Instruct personnel in procedures for cutting, cleaning, and carving meat, poultry, and seafood . . . . . E-8
- .941 Train and supervise personnel in the mechanics of reports and records applicable to the general mess; establish maintenance schedules in cooperation with the engineering department . . . . . E-8
- .942 Train personnel in general mess operation for NBC Warfare . . . . . E-8
- .943 Instruct personnel in the duties of the mess hall master-at-arms in order to coordinate food preparation and food service . . . . . E-8

2.00 Examination Factors

None.

★ MASTER CHIEF COMMISSARYMAN (CSCM)

QUALIFICATIONS FOR ADVANCEMENT

- .95 Determine requirements for food service equipment for the supply department . . . . . E-9
- .96 Supervise and provide guidance to personnel in directing conformity with safety and sanitary precautions and regulations involving foods, services, and equipment . . . . . E-9
- .97 Prepare, implement, and maintain an in-department training program for subordinate personnel . . . . . E-9
- .98 Supervise and ensure compliance with directives, publications, and instructions regarding supply department personnel . . . . . E-9
- .99 Prepare general correspondence concerning subsistence matters and administrative matters pertaining to the subsistence department . . . E-9
- .991 Serve as liaison man between local activities and ship or station supply department . . . . . E-9
- .992 Indoctrinate subordinate personnel in the organization and management of a general mess, both ashore and afloat . . . . . E-9

2.00 Examination Factors

None.

2-8.2

INVESTIGATOR (IV)

EMERGENCY RATING

SCOPE

Investigators conduct investigations over which Coast Guard Intelligence has cognizance. These investigations include but are not limited to the following: personnel security, offenses against the Uniform Code of Military Justice, offenses against the Coast Guard and Coast Guard personnel, offenses against the laws of which the Coast Guard is the enforcement agency. Obtains evidence by close surveillance, interrogation, interview, examination of records and files, and scientific deduction. Must be a graduate of the Treasury Department Law Enforcement School, Criminal Investigation Enlisted Course at the Army's Provost Marshall General's School, or comparable schools of the Navy or Air Force, plus three months of satisfactory "in training" service at a district intelligence office; or possess comparable previous experience and/or training in investigative work plus three months of "in training" service at a district intelligence office. Candidates for the rating must have an established reputation for integrity, reliability, and trustworthiness; and be possessed of good emotional stability, morals, personal habits and associations.

QUALIFICATIONS FOR ADVANCEMENT

Qualifications for advancement will not be established at this time. Each case will be based on the needs of the service and the experience and knowledge of the individual.

## INTELLIGENCEMAN (IX)

### EMERGENCY RATING

#### SCOPE

It is contemplated that this rating will utilize numerous civilian specialists such as are normally required in an operational intelligence office. These specialists would include, but not be limited to accountants, statisticians, aerial photography interpreters, analysts, foreign language specialists, cryptanalysts, etc. The incumbents of these billets would not necessarily be proficient in all phases of operational intelligence, but would be utilized to the limit of their civilian specialities and promoted in accordance with their education and experience in their field.

#### QUALIFICATIONS FOR ADVANCEMENT

Qualifications for advancement will not be established at this time. Each case will be based on the needs of the service and the experience and knowledge of the individual.

JOURNALIST (JO)

GENERAL RATING

SCOPE

Journalists assist public information officers and commanding officers in public relations; prepare material contributing to the home town news program of the Coast Guard; write Coast Guard news releases from personal interviews, examination of messages, and witnessing of events; take and process news photographs; coordinate special events; write feature articles on Coast Guard activities and personnel; write captions and prepare picture stories; arrange radio and television programs; operate sound recorders; prepare biographies of Coast Guard personnel and histories of Coast Guard units; and prepare Coast Guard publications.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for Advancement to JO

A. PUBLIC INFORMATION

1.00 Practical Factors

- .01 Demonstrate a thorough knowledge of the manner in which copy, photographs, and recorder interviews are prepared for release to Fleet Home Town News Center . . . . . E-4
- .02 Conduct interviews for radio and television presentation . . . . . E-4
- .40 Train and supervise personnel in arranging details for special events in Coast Guard public relations and in public information news gathering and processing . . . . . E-5
- .41 Arrange news conferences to which press, radio, newsreel, and television representatives are invited . . . . . E-5
- .42 Assist public information officer in establishing liaison with local community and media representatives . . . . . E-5
- .43 Administer command internal and external information programs . . . . . E-5
- .60 Administer a public information office and supervise personnel assigned . . . . . E-6
- .80 Prepare a public information program for a ship or shore unit, including administrative details . . . . . E-7
- .81 Prepare annexes/orders to supplement existing public information directives, keeping commands informed of current public information policies . . . . . E-7
- .82 Arrange a public service program for radio or television presentation. . . . . E-7
- .83 Outline/explain procedures in establishing or setting up special events including displays, exhibits, open house demonstrations, and commissioning of new commands . . . . . E-7
- .84 Prepare a shooting outline for motion picture coverage of a major event, such as a ship commissioning, search and rescue case, or scientific expedition . . . . . E-7
- .85 Prepare a shooting script for a Coast Guard television feature . . . . . E-7
- .86 Prepare cost estimates for complete production and distribution of a monthly command publication and a Welcome Aboard Booklet . . . . . E-7
- .87 Prepare quarterly and annual operating budget for operation of public information programs, including photographic and printing functions . . . . . E-7



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
JO

A. PUBLIC INFORMATION - Continued

2.00 Examination Factors

- .01 Basic principles of public relations and their application to Coast Guard; Coast Guard public information policies and procedures as outlined in Guide to Public Information (CG-247) . . . . . E-4
- .02 Organization of the Coast Guard with emphasis upon relationship of Coast Guard to other Armed Services and agencies of the Department of Transportation . . . . . E-4
- .40 Stories and articles by style to fit the needs of a given market . . . . . E-5
- .41 Sources of information on protocol, honors, ceremonies, history, customs, and traditions of the Coast Guard . . . . . E-5
- .42 Regulations governing the embarkation of news media representatives in Coast Guard ships and aircraft . . . . . E-5
- .43 Objectives and requirements of the Coast Guard public information program . . . . . E-5
- .44 Principles of successful community relations, including conduct and cooperation of individuals, ships, or units with community; official and unofficial participation in community events; staging of displays, exhibits, and open house demonstrations . . . . . E-5
- .45 Procedures and techniques for obtaining, processing, and disseminating news for radio and television . . . . . E-5
- .46 Organization, operation, and methods of news services, television networks, and news syndicates . . . . . E-5
- .60 Research techniques, including contemporary and historical sources of information . . . . . E-6
- .61 Essentials of a public information directive . . . . . E-6
- .80 Procedures and requirements for establishing a public information office . . . . . E-7
- .81 Types and capabilities of color photography in PIO projects . . . . . E-7
- .82 Basic PIO responsibilities for Field Press Censorship . . . . . E-7
- .83 Scope and content of directives in the 5700 series issued by the Commandant . . . . . E-7
- .84 Area RCC; cooperation with RCC's of the other Armed Forces and foreign countries; general operation of AMVER . . . . . E-7
- .85 Relationship with Navy, especially in cases when Coast Guard commands are under the Navy's operational command . . . . . E-7

B. NEWSWRITING

1.00 Practical Factors

- .01 Write stories in journalistic style for Coast Guard and other publications, stories for Fleet Home Town News Center, headlines and captions for photographs, spot announcements, and stories and briefs originating in news releases, and announcements of awards . . . . . E-4
- .02 Obtain news by personnel interview, examining messages, and witnessing and transcribing events with a sound recorder . . . . . E-4
- .03 Write a straight news release for radio and television . . . . . E-4
- .04 Conduct a tape-recorder interview . . . . . E-4
- .05 Rewrite stories from Coast Guard sources for release to civilian news media and from civilian news sources for internal use in Coast Guard publications . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
JO

B. NEWSWRITING - Continued

1.00 Practical Factors - Continued

- .06 Select copy for publication . . . . . E-4
- .07 Write stories about spot news events, such as search and rescue cases, for release to the news media by telephone . . . . . E-4
- .08 Prepare "beeper" releases for recording by the broadcast media . . . . . E-4
- .40 Assign men to news details . . . . . E-5
- .41 Cover major news events for newspaper, radio, and television release . . . . . E-5
- .42 Prepare speeches on Coast Guard topics of a generalized nature for command and community and maintain a speech file . . . . . E-5
- .43 Write technical/scientific and special feature articles about Coast Guard activities and personnel . . . . . E-5
- .44 Supervise, coordinate, and train staff members of a station newspaper or District Information Bulletin in selecting and printing news . . . . . E-5

2.00 Examination Factors

- .01 Organization of a newspaper and functions of the editorial staff . . . . . E-4
- .02 Fundamentals of newswriting; types of stories and leads; news styles; determinants of news value . . . . . E-4
- .03 Sources of news within the Coast Guard . . . . . E-4
- .04 Types of material required by wire services, television networks, and feature syndicates . . . . . E-4
- .05 Meaning of libel; basics of press ethics . . . . . E-4
- .06 Elements in selection of news photographs, such as reader interest and composition . . . . . E-4
- .07 Origin, development, and function of the U. S. Coast Guard from its inception to present time . . . . . E-4
- .08 Missions and roles of the Coast Guard . . . . . E-4
- .09 Techniques of personal, radio, and television interviews; of reporting eyewitness accounts; and of recording news events . . . . . E-4
- .40 Use of copyrighted material in Coast Guard publications and news releases . . . . . E-5
- .41 Fundamentals of speechwriting . . . . . E-5
- .42 Arranging of news conferences . . . . . E-5
- .60 Fundamentals of accreditation of U. S. and foreign correspondents . . . . . E-6
- .79 Fundamental requirements of:
  - a. Radio scripts . . . . . E-5
  - b. Television scripts . . . . . E-6
  - c. Motion picture scripts . . . . . E-7

C. PHOTOGRAPHY

1.00 Practical Factors

- .01 Make arrangements for individual or group photographs . . . . . E-4
- .02 Select pictures for publication; maintain file of photographs; keep record of photographs issued to news media and public . . . . . E-4
- .03 Take news photographs with good composition for reproduction . . . . . E-4
- .04 Develop exposed film . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
JO

C. PHOTOGRAPHY - Continued

1.00 Practical Factors - Continued

- .05 Make contact and projection prints for reproduction . . . . . E-4
- .40 Operate hand-held movie cameras to record news events and other happenings for release to television and newsreel media . . . . . E-5

2.00 Examination Factors

- .01 Fundamentals of basic cameras used in news photography . . . . . E-4
- .02 Types of film used in news photography . . . . . E-4
- .03 Fundamentals of processing film and prints . . . . . E-4
- .04 Fundamentals of composition . . . . . E-4

D. EDITING

1.00 Practical Factors

- .01 Edit copy in prescribed style and make necessary corrections; use the Armed Forces Style Guide . . . . . E-4
- .02 Proofread galley and/or page proofs for errors . . . . . E-4
- .40 Prepare and edit messages for release to news media . . . . . E-5

2.00 Examination Factors

- .01 General rules governing correct English usage, punctuation, spelling, and grammar; copyreader's marks; proofreading symbols . . . . . E-4

E. LAYOUT AND MAKEUP

1.00 Practical Factors

- .01 Crop, scale, and prepare artwork for reproduction . . . . . E-4
- .02 Make page layouts for offset, letterpress, and mimeographed publications, such as District Information Bulletins, "Welcome Aboard" guidebooks, open house pamphlets, and internal information publications . . . . . E-4

2.00 Examination Factors

- .01 Fundamentals and basic concepts of layout, makeup, and reproduction procedures, including terminology, standard unit of printer's measure, and typefaces . . . . . E-5

F. ADMINISTRATIVE AND CLERICAL

1.00 Practical Factors

- .01 Operate office duplicating machines . . . . . E-4
- .02 Perform operational maintenance on office, duplicating, photographic, and tape recording equipment . . . . . E-4
- .03 Prepare, route, and file official correspondence . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
JO

F. ADMINISTRATIVE AND CLERICAL - Continued

1.00 Practical Factors - Continued

- .39 Typewrite for 5 minutes (See Performance Test Instructions)
- a. At 20 words per minute . . . . . E-4
- b. At 30 words per minute . . . . . E-5
- c. At 40 words per minute . . . . . E-6

2.00 Examination Factors

- .01 Security regulations of classification, preparation, and safe-guarding of classified matter including photographs . . . . . E-4
- .40 Regulations applying to civilians other than news media representatives in Coast Guard ships, aircraft, and small boats . . . . . E-5
- .41 General content of Coast Guard Directives System and Coast Guard Standard Subject Classification System . . . . . E-5

★ SENIOR CHIEF JOURNALIST (JOCS)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .90 Demonstrate a thorough knowledge of PIO procedures in an emergency. Outline steps to be taken in handling a major disaster story, including special handling required for certain types of incidents . . . . . E-8
- .91 Prepare a Command Open House Pamphlet . . . . . E-8
- .92 Supervise operation and upkeep of a PIO photographic laboratory . . . . . E-8
- .93 Organize and supervise training programs for writers and editors . . . . . E-8

2.00 Examination Factors

- .90 Procedures for establishment and operation of a Press Liaison Office. . . . . E-8
- .91 Scope, content, material treatment, and public appeal of trade publications . . . . . E-8

★ MASTER CHIEF JOURNALIST (JOCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Prepare a Community Relations Study, with recommendations designed to affect improvement in weak areas . . . . . E-9
- .96 Prepare a comprehensive report of PIO activities at the command during the previous twelve month period; discuss strengths and weaknesses and make recommendations for future programs . . . . . E-9
- .97 Perform function of a Public Information Assistant . . . . . E-9

2.00 Examination Factors

- .95 Primary factors determining the feasibility of installing photographic equipment in PIO photographic laboratories . . . . . E-9
- .96 Principles of organizational analysis and work simplification applicable to administrative offices . . . . . E-9

MACHINE ACCOUNTANT (MA)

SERVICE RATING

SCOPE

Machine Accountants operate key-driven processing equipment to record source data; set up and operate data processing equipment including data transceivers, sorters, collators, reproducers, interpreters, electronic statistical machines, calculating punches, alphabetic accounting machines and electronic data processing machines for accounting and statistical purposes; process incoming information and make routine and data processing applications, and in higher paygrades are thoroughly familiar with accepted electronic data processing applications and management of data processing offices and installations.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MA

A. MACHINE OPERATION AND SET-UP

1.00 Practical Factors

- .01 Set up quickly and accurately the operating controls of the sorter, interpreter, reproducing summary punch machine, collator, and accounting machines, following diagrams which indicate the correct use of those controls. . . . . E-4
- .02 Operate control buttons and keys, and feed cards and/or report forms into applicable machines . . . . . E-4
- .03 Act on verbal instructions to wire control panels or to prepare wiring diagrams for operations such as interpreting, X-elimination and transfer, emitting, reproducing, gangpunching, sequence checking, merging, matching, detail printing, group printing, and simple addition and subtraction . . . . . E-4
- .04 Operate key punch machines and card verifier; prepare program cards and use of program drums . . . . . E-4
- .05 Perform without detailed instructions ordinary operations involving block and alphabetic sorting . . . . . E-4
- .06 Use procedural manuals for wiring and operation . . . . . E-4
- .40 Remove card jams which do not require unauthorized disassembly of machine . . . . . E-5
- .41 Wire control panels, or prepare wiring diagrams, and set up machines for moderately difficult operations upon indication of desired results . . . . . E-5
- .60 Prepare wiring diagrams and wire control panels for complex operations . . . . . E-6
- .61 Detect and correct errors caused by faulty source data and/or machine operations . . . . . E-6

2.00 Examination Factors

- .01 Operating principles, uses, and nomenclature of key punch, verifier, interpreter, collator, sorter, reproducer, and alphabetic accounting machine . . . . . E-4
- .02 Simple wiring diagrams for the interpreter, collator, reproducer, and alphabetic accounting machine . . . . . E-4
- .03 Uses of manuals of procedure for wiring and operating . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MA

A. MACHINE OPERATION AND SET-UP - Continued

2.00 Examination Factors - Continued

- .41 Methods of wiring control panels, setting up machines, and preparing simple wiring diagrams for recurring machine operations on interpreter, collator, reproducer, and alphabetic accounting machines . . . . . E-5
- .60 Complex wiring diagrams and machine set-ups for interpreter, collator, reproducer, and alphabetic accounting machine . . . . . E-6

B. ELECTRONIC DATA PROCESSING

1.00 Practical Factors

- .40 Perform data processing runs under the supervision of a qualified machine operator . . . . . E-5
- .41 Program a sub-routine or a portion of a main routine . . . . . E-5
- .42 Use procedures established within own work area for documenting problem solutions . . . . . E-5
- .60 Apply currently available programming techniques for a defined problem with minimum supervision . . . . . E-6
- .61 Apply restart procedures necessitated by error detection or failure to meet a systems check . . . . . E-6
- .80 Program and operate computer system at present duty station with a minimum of supervision . . . . . E-7

2.00 Examination Factors

- .40 Nomenclature and general terminology of electronic data processing systems . . . . . E-5
- .60 Functions of machine components of electronic data processing systems, true binary arithmetic, theory of core, drum, and disc storage, basic concept of utility programs, and use and advantage of magnetic tape and disk . . . . . E-6
- .61 Electric accounting machine (EAM) vs. electronic data processing machine (EDPM) applications . . . . . E-6
- .80 Applications of electronic data processing systems; theory of programming, including the construction and advantages of sub-routines; theories of common symbolic and machine language and blocked tape records; machine and application differences between fixed-word length and variable-word length machines; installation and site preparation . . . . . E-7

C. SAFETY PRECAUTIONS

1.00 Practical Factors

- .01 Observe safety precautions for setting up, operating, and maintaining machines . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MA

C. SAFETY PRECAUTIONS - Continued

2.00 Examination Factors

- .39 Safety precautions involved in performing tasks appropriate to the applicable rates under 1.00 Practical Factors listed under all subject headings.

D. SUPERVISORY CONTROL AND FLOW OF WORK

1.00 Practical Factors

- .40 Act as group leader for a small machine group, giving instructions in routine machine operations and supervising proper flow of work . . . . . E-5
- .41 Prepare and maintain basic flowcharts and procedures for manual and machine operations . . . . . E-5
- .60 Set up flowcharts and maintain adequate control of all documents and manual operations related to machine operations; set up flowcharts and maintain adequate control of all machine operations . . . E-6
- .61 Balance and check against manual and machine controls . . . . . E-6
- .62 Prepare and maintain complex flowcharts and procedures for manual and machine operations, including the design of report forms . . . . . E-6
- .63 Determine the need for a setup, and maintain controls of the type and scope necessary to ensure accuracy of reports and efficient work scheduling . . . . . E-6
- .64 Prepare, route, and file official correspondence as necessary in a data processing installation, using the Coast Guard subject classification system . . . . . E-6
- .80 Supervise both manual and machine operations in a tabulating installation; schedule and execute flow of work; train subordinates in all machine operations and evaluate their work . . . . . E-7
- .81 Review accounting reports for accuracy and completeness . . . . . E-7
- .82 Plan flow of work and review accounting reports for accuracy and completeness . . . . . E-7
- .83 Design and lay out cards and report forms and prepare manuals of procedures . . . . . E-7
- .84 Supervise manual and machine operations in data processing installations; plan, schedule, and execute flow of work; train subordinates in machine operations and evaluate their work . . . . . E-7
- .85 Perform office management functions incident to control, maintenance, and procurement of stock and equipment for data processing installations . . . . . E-7

2.00 Examination Factors

- .01 Identification and use of flowchart symbols . . . . . E-4
- .40 Card form design techniques . . . . . E-5
- .41 Procedures for preparing and routing official correspondence, filing correspondence, and using the Coast Guard filing system . . . . . E-5
- .60 Methods and manner of preparing flowcharts and written procedures, including computation of machine loads and scheduling of the various operations . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MA

D. SUPERVISORY CONTROL AND FLOW OF WORK - Continued

2.00 Examination Factors - Continued

- |     |  |     |
|-----|--|-----|
| .61 | General principles to be followed in preparation of manuals of procedure and advantages to be derived from their use . . . . .                               | E-6 |
| .62 | Methods of verification and principles to be followed in deciding which method to use . . . . .  | E-6 |
| .63 | Means of maintaining effective work control . . . . .  | E-6 |
| .64 | Procedures for determining and maintaining effective controls to ensure accuracy of reports including computations of machine loads and scheduling . . . . . | E-6 |
| .80 | Methods of evaluation to determine machine unit efficiency . . . . .   | E-7 |
| .81 | Methods of improving an inefficient operation . . . . .  | E-7 |



SERVICE RATING

SCOPE

Data Processing Technicians operate data processing equipment to record source data; set up and operate data processing equipment, including data transceivers, sorters, collators, reproducers, interpreters, alphabetic accounting machines and digital electronic data processing machines for accounting and statistical purposes; process incoming information and make routine and special reports as required; are thoroughly familiar with data processing applications, including, in the higher paygrades, applications of general purpose digital computers, programming, systems analysis, and participation in designing electronic data processing systems.

QUALIFICATIONS FOR ADVANCEMENT

Required for Advancement to DP

A. SAFETY

1.00 Practical Factors

.01 Observe safety precautions for setting up, operating and maintaining machines . . . . . E-4

2.00 Examination Factors

.01 Safety precautions involved in performing tasks appropriate to the applicable rates under 1.00 Practical Factors listed under all subject headings . . . . . E-4

B. MACHINE OPERATION AND SETUP

1.00 Practical Factors

.01 Prepare program cards for, and operate card punches and verifiers; use program drums . . . . . E-4

.02 Set up the following machines to process cards and, where appropriate, prepare reports, and operate controls of sorters, interpreters, reproducers, collators, and alphabetic accounting machines . . . . . E-4

.03 Prepare wiring diagrams and wire control panels for the following basic machine operations: interpreting, reproducing, comparing, X-elimination and transfer, emitting, gangpunching, intersperse gangpunching, summary punching, selective reproducing, sequence checking, merging, selection, matching, editing, detail printing, group printing, group indication, simple addition and subtraction, and program control . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DP

B. MACHINE OPERATION AND SETUP - Continued

1.00 Practical Factors - Continued

- .04 Remove card jams which do not require disassembly of machines E-4
- .40 Prepare wiring diagrams, wire control panels, and set up machines for moderately difficult operations upon indication of desired end results and without further instructions . . . E-5
- .41 Determine cause of operational failures . . . . . E-5
- .60 Prepare wiring diagrams and wire control panels for complex operations . . . . . E-6

2.00 Examination Factors

- .01 Operation, use, and nomenclature of card punches, verifiers, interpreters, sorters, reproducers, collators, data transceivers, and alphabetic accounting machines . . . . . E-4
- .02 Basic wiring diagrams for interpreters, reproducers, collators, and alphabetic accounting machines . . . . . E-4
- .40 Moderately difficult wiring diagrams, and machine set ups for reproducers, collators, and alphabetic accounting machines . . . . . E-5
- .60 Complex wiring diagrams and machine set ups for reproducers, collators, and alphabetic accounting machines . . . . . E-6

C. ELECTRONIC DATA PROCESSING

1.00 Practical Factors

- .01 Set up and operate computer to perform data processing runs under supervision of a qualified computer operator . . . . E-4
- .02 Perform restart procedures necessitated by error detection or failure of computer to meet all systems check . . . . E-4
- .40 Use procedures established within own work area to document sequences of operations . . . . . E-5
- .41 Maintain tape and direct access storage library . . . . . E-5
- .42 Operate tape rehabilitation equipment . . . . . E-5
- .60 Use techniques appropriate to local computer system: Flow chart, code, assemble, de-debug, and document program to process a defined problem with minimum supervision . . . . E-6
- .61 Schedule all production runs in a system with minimum supervision . . . . . E-6
- .62 Perform systems analysis of a stated problem to define data input, processing procedure, and desired output with minimum supervision . . . . . E-6
- .80 Use techniques appropriate to local computer system: Flow chart, code, assemble, de-debug, and document program to process a defined, complex problem without supervision . . . . E-7
- .81 Prepare program run book which controls the process of a specific data processing run . . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DP

C. ELECTRONIC DATA PROCESSING - Continued

1.00 Practical Factors - Continued

- .82 Maintain chart depicting all runs in the active EDP system in use at current duty station . . . . . E-7
- .83 Perform systems analysis of a stated complex problem to define data input, processing procedure, and desired output without supervision . . . . . E-7

2.00 Examination Factors

- .01 General terminology of electronic data processing systems . . . E-4
- .02 Functions of operating units of an electronic data processing system . . . . . E-4
- .03 Theory of binary and other numbering systems used in data processing. . . . . E-4
- .04 Theory and construction of core, drum, tape, and disc storage, and the use of on-line inquiry stations . . . . . E-4
- .40 Application of electronic data processing systems; theory of programming, including the construction and advantages of sub-routines; theories of common symbolic and machine language and blocked tape records; machine and application differences between fixed-word length and variable-word length machines . . . . . E-5
- .41 General organization and functions of an automatic data processing installation ashore and afloat . . . . . E-5
- .42 Programming a sub-routine or a portion of a main routine . . . . E-5
- .60 Principles and techniques of programming using both symbolic and actual computer language . . . . . E-5
- .61 Procedures for program maintenance and associated problems . . . E-6
- .62 Principles and basic applications of systems analysis . . . . . E-6
- .63 Application of automatic data processing using electric accounting machines (EAM) vs. electronic digital computer (EDP) . . . . E-6
- .64 Procedures for maintaining and reporting equipment utilization . . E-6
- .80 Principles and techniques for site preparation, installation, and operation of both electric accounting machines (EAM) and electronic computers . . . . . E-7
- .81 Scope, content, and use of all instructions, manuals, and handbooks pertaining to local automatic data processing installation . . . . E-7
- .82 Procedures and standards for development and promulgation of detailed technical instructions appropriate to local data processing installation . . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DP

D. SUPERVISORY CONTROL AND FLOW OF WORK

1.00 Practical Factors

- .01 Use manuals of procedure for moving data through a sequence of operations, balancing results and recording operating data as required . . . . . E-4
- .02 Review accounting reports for accuracy and completeness . . . E-4
- .40 Prepare and maintain adequate documentation of basic data processing procedures, following the set standards and policies for own work area . . . . . E-5
- .60 Maintain adequate controls over the data being processed to produce accurate and timely results, including the collection and verification of operating data within own work area . . . . E-6
- .61 Act as a team leader, directing and supervising the work of machine operators, either EAM or EDPM . . . . . E-6
- .80 Supervise manual and machine functions to coordinate smooth flow of data between segments of own data processing system. Train subordinates in machine operations and evaluate their work . . . . . E-7
- .81 Perform office management functions incident to control, preventive maintenance, and procurement of consumable supplies and equipment for data processing installations . . . . . E-7
- .82 Prepare and maintain complex flow charts and procedures for manual and machine operations, including the design of report forms . . . . . E-7
- .83 Determine and direct adequate administrative controls of the type and scope necessary to ensure accuracy of reports and efficient work scheduling . . . . . E-7
- .84 Establish standards for documenting, scheduling, controlling, and executing the flow of work within own data processing system . . . . . E-7
- .85 Conduct a continuous and realistic program for evaluation of existing operational efficiency and as necessary perform the systems analysis of proposed changes to the data processing requirements . . . . . E-7
- .86 Revise and incorporate processing, scheduling, or operating techniques as required to improve the least efficient work areas . . . . . E-7

2.00 Examination Factors

- .01 Identification and use of standard DOD flow chart symbols . . E-4
- .40 Flow-charting and procedural manual preparation technique . . E-5
- .60 Card form design techniques . . . . . E-6
- .61 Methods of computing machine work loads and need for realistic scheduling . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DP

E. MAINTENANCE

1.00 Practical Factors

- .01 Prepare a Shipboard Maintenance Action Form . . . . . E-4
- .59 In accordance with the Planned Maintenance Subsystem of the Navy Maintenance and Material Management System:
  - a. Assist in the preparation of a weekly schedule of preventive maintenance . . . . . E-5
  - b. Prepare a weekly schedule of preventive maintenance . . . . . E-6
  - c. Prepare a Planned Maintenance System Feedback Report . . . . . E-6
  - d. Assist in the preparation of a quarterly schedule of preventive maintenance . . . . . E-7

2.00 Examination Factors

None in addition to those implied in the above Practical Factors.

SENIOR CHIEF DATA PROCESSING TECHNICIAN (DPCS)

QUALIFICATIONS FOR ADVANCEMENT	Required for Advancement to
1.00 Practical Factors	DP
.90 Perform analysis and design of an electronic data processing system .	E-8
.91 Prescribe operating standards and coordinate the efforts of units within an electronic data processing installation . . . . .	E-8
.92 Provide technical advice and information concerning capabilities, limitations, and operational employment of data processing equipment.	E-8
.93 Direct the operation of an electronic data processing office or in- stallation . . . . .	E-8
.94 Instruct personnel in the Navy techniques of instruction . . . . .	E-8
2.00 Examination Factors	
.90 Content and scope of Navy-used manuals, handbooks, and training aids relating to data processing equipment . . . . .	E-8
.91 Navy Directives System, correspondence media, and filing system . . .	E-8
.92 Content and objectives of the Department of the Navy Security Manual for Classified Matter . . . . .	E-8
.93 Contents and objectives of the Navy Maintenance and Material Manage- ment (3-M) System . . . . .	E-8

MASTER CHIEF DATA PROCESSING TECHNICIAN (DPCM)

QUALIFICATIONS FOR ADVANCEMENT	Required for Advancement to
1.00 Practical Factors	DP
.95 Implement and supervise evaluation and improvement techniques . . .	E-9
.96 Establish procedures for operation of a ship or station correspond- ence and reports control system . . . . .	E-9
2.00 Examination Factors	
.95 Capabilities, limitations, uses, and operation of data processing equipment, including site preparation and installation . . . . .	E-9
.96 General content of the Navy-Marine Corps Standard Subject Classi- fication System . . . . .	E-9

POSTAL CLERK (PC)

SERVICE RATING

SCOPE

Postal Clerks operate Coast Guard post offices; supervise, organize, and activate or deactivate a Coast Guard post office; perform postal counterwork, including sale of stamps and money orders; process incoming and outgoing mail; maintain a mail directory; maintain security of postal effects and mail matter; and prepare and file correspondence, records, and reports.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PC

A. ADMINISTRATION

1.00 Practical Factors

- .01 Maintain files of postal correspondence, records, and reports. . . . . E-4
- .02 Maintain and operate a directory service . . . . . E-4
- .03 Prepare requests for nomination or revocation of Postal Clerk appointments E-4
- .04 Use and maintain Post Office Department and Coast Guard publications used in the administration of the postal service . . . . . E-4
- .05 Prepare and forward mail tracers and claims for indemnification. . . . . E-4
- .06 Maintain required records and reports of postage stamps and stamped paper purchased and sold . . . . . E-4
- .07 Draft a message in rough form. . . . . E-4
- .40 Maintain records of inquiries concerning the mail service, including complaints, claims, and schedules; and prepare for appropriate signature, replies to, and/or letters of transmittal for, all correspondence. . . . . E-5
- .41 Supervise and train personnel in the operation of a Coast Guard post office . . . . . E-5
- .60 Operate a Coast Guard post office. . . . . E-6
- .61 Use schedules to determine routing and transportation of mail. . . . . E-6
- .62 Prepare reports of money order sales and monthly audits and make required distribution. . . . . E-6
- .63 Supervise preparation and maintenance of local postal records and reports and ensure their prompt distribution . . . . . E-6
- .80 Audit and review inspection reports of Coast Guard post offices, including financial accountability, mail handling, and dispatching; recommend corrective action. . . . . E-7

2.00 Examination Factors

- .01 Military and Post Office Department regulations pertaining to postal operations, including agencies and personnel entitled to use the Coast Guard postal service, acceptability of classes of mail, rates of postage, distribution and dispatch procedures, handling of registered, certified and insured mail, postal financial operations, customs requirements, disposition of loose articles and undeliverable mail, and maintenance and disposition of mail records. . . . . E-4
- .40 Responsibilities of the Post Office Department and the Coast Guard as stated in the Postal Agreement . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PC

A. ADMINISTRATION - Continued

2.00 Examination Factors - Continued

- .41 Procedures for activating, suspending, or discontinuing a Coast Guard post office. . . . . E-5
- .60 Procedures for maintaining and operating a locator file of ships serviced by a Coast Guard post office. . . . . E-6

B. POSTAL COUNTERWORK

1.00 Practical Factors

- .01 Determine the mailability and class of domestic mail matter; affix endorsements, such as "Fragile"; and compute and charge the proper rates for postage and special services, including registered, certified, and insured mail . . . . . E-4
- .02 Sell and cash domestic postal money orders and maintain required records; prepare daily reports . . . . . E-4
- .03 Answer verbal inquiries concerning routine mail service. . . . . E-4
- .04 Accept international letter mail for transmission and determine rates. . . . . E-4
- .05 Provide guidance for preparation of customs declarations for mail as required by postal regulations . . . . . E-4
- .60 Evaluate effectiveness of postal counter and mail service through observation and analysis of complaints and claims. . . . . E-6

2.00 Examination Factors

- .01 Spelling and abbreviations of common words and place names . . . . . E-4
- .02 Handling official mail transmitted under "Postage and Fees Paid" indicia according to military and postal regulations . . . . . E-4
- .03 Weight and size limitations applicable to mail to and from United States and foreign civilian post offices. . . . . E-4
- .40 Procedures governing sale of international money orders. . . . . E-5
- .41 Procedures for making refunds for overpayment of postage, damaged postage stamps, and stamped paper. . . . . E-5

C. PROCESSING MAIL

1.00 Practical Factors

- .01 Receive, sort, and deliver incoming mail; maintain required receipts on accountable mail . . . . . E-4
- .02 Collect, cancel, and sort outgoing mail; utilize direct and working letter ties, pouches, and sacks. . . . . E-4
- .03 Dispatch outgoing domestic and international mail, according to class and any special service paid . . . . . E-4
- .04 Mark up short-paid outgoing mail and take action as described in the Postal Manual; collect postage on incoming mail. . . . . E-4



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
FC

C. PROCESSING MAIL - Continued

1.00 Practical Factors - Continued

- .05 Prepare registered mail for dispatch via rotary-lock and sack-jacket systems. . . . . E-4
- .06 Maintain records on mail received and dispatched . . . . . E-4
- .07 Accept other unit's closed mail and provide storage for later delivery . . . . . E-4
- .60 Schedule work to ensure that mail will flow without delay and on a priority basis . . . . . E-6

2.00 Examination Factors

- .01 Use of ZIP codes . . . . . E-4
- .02 Classes of mail and transmission regulations . . . . . E-4
- .03 General content and use of the Standard Distribution List. . . . . E-4
- .40 Regulations governing storage of undelivered mail. . . . . E-5
- .41 Current Coast Guard and Post Office Department regulations concerning disposal, stowage, and transmission of obsolete files and records. . . . . E-5

D. OPERATIONAL MAINTENANCE

1.00 Practical Factors

- .01 Clean and perform operational maintenance on typewriters, scales, and adding and print-punch money order machines. . . . . E-4

2.00 Examination Factors

- .40 Disposition of postal equipment when unserviceable or in need of repair. . . . . E-5

E. POSTAL TRANSPORTATION

1.00 Practical Factors

- .01 Load and unload mail vehicles, using proper methods to facilitate delivery and prevent damage or loss. . . . . E-4
- .40 Prepare forms required for transportation of military mail . . . . . E-5
- .60 Establish mail transportation schedules. . . . . E-6

2.00 Examination Factors

None.

F. SUPPLY

1.00 Practical Factors

- .40 Estimate requirements and prepare requisitions for postal and office supplies, postage stamps, blank money order forms, other accountable postal equipment, and for increase or decrease in fixed stamp credit . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PC

F. SUPPLY - Continued

1.00 Practical Factors - Continued

.60 Review stamp, money order form, and general supply requisitions for. . . E-6

2.00 Examination Factors

.01 Procedures for reporting shortages of, or damage to, stamp stock . . . . E-4

.02 Procedures for receiving, distributing, and accounting for serially  
numbered money order forms . . . . . E-4

G. SECURITY OF POSTAL EFFECTS AND MAIL MATTER

1.00 Practical Factors

.01 Maintain prescribed security for registered, certified, and insured mail E-4

.02 Inspect premises, safe, locked drawers, mailpouches, and mailsacks for  
security . . . . . E-4

.03 Change the combination, clean, and lubricate a standard three  
tumbler lock . . . . . E-4

.80 Draft instructions on security of postal effects and mail matter according  
to current Coast Guard and Post Office Department methods. . . . . E-7

2.00 Examination Factors

.01 Regulations governing classification, preparation, and safeguarding of  
classified matter. . . . . E-4

H. CLERICAL SKILLS

1.00 Practical Factors

.01 Operate adding and print-punch money order machines. . . . . E-4

.02 Typewrite for 5 minutes at 20 words per minute. (See Performance  
Test Instructions) . . . . . E-4

2.00 Examination Factors

None.

PERSONNELMAN (PN)

SERVICE RATING

SCOPE

Personnelmen perform enlisted personnel administration duties involved in manpower utilization, including such records and reports as may be required; counsel enlisted personnel concerning Coast Guard ratings, training, advancement, educational opportunities and the rights and benefits and advantages of a Coast Guard career; conduct tests and interviews regarding various personnel programs; utilize and maintain applicable current publications and directives; conduct military manpower staffing, organization and occupational analysis studies; and perform required clerical duties.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PN

A. OFFICE PROCEDURES, EQUIPMENT AND PUBLICATIONS

1.00 Practical Factors

- .01 Write or print legibly; spell commonly used words and naval terms. . . . E-4
- .02 Speak clearly and distinctly . . . . . E-4
- .03 Maintain files, including cross-reference indexes, in accordance with Coast Guard Standard Subject Classification System; file directives in accordance with Coast Guard Directives System. . . . . E-4
- .04 Requisition, stow and issue supplies . . . . . E-4
- .05 Meet enlisted, officer and civilian personnel and handle telephone communications as a receptionist . . . . . E-4
- .06 Prepare from rough draft commonly used forms of correspondence and messages . . . . . E-4
- .07 Operate office duplicating equipment . . . . . E-4
- .08 Clean, oil and make minor operating adjustments to typewriters and office duplicating equipment. . . . . E-4
- .09 Requisition, use, file, and maintain official publications . . . . . E-4
- .39 Typewrite for 5 minutes: (See Performance Test Instructions)
  - a. At 30 words per minute . . . . . E-4
  - b. At 40 words per minute . . . . . E-5
  - c. At 50 words per minute . . . . . E-6
- .40 Organize and set up files in accordance with Coast Guard Standard Subject Classification System. . . . . E-5
- .60 Originate correspondence, instructions and notices . . . . . E-6
- .61 Supervise the procurement, maintenance, stowage, issuance and custody of official publications. . . . . E-6

2.00 Examination Factors

- .01 Good English usage, including punctuation, spelling and Coast Guard abbreviations. . . . . E-4
- .02 Content, purpose and use of official publications and directives affecting personnel administration . . . . . E-4
- .40 Correspondence practices and procedures. . . . . E-5
- .41 Regulations concerning disposal, stowage and transmission of obsolete records. . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PN

A. OFFICE PROCEDURES, EQUIPMENT AND PUBLICATIONS - Continued

2.00 Examination Factors - Continued

- .60 Equipment procurement procedures . . . . . E-6
- .80 Office management concepts and techniques. . . . . E-7

B. TRAINING, EDUCATION AND TESTING

1.00 Practical Factors

- .01 Requisition, maintain, issue and account for training and educational manuals and materials. . . . . E-4
- .02 Prepare and submit requests for training and educational accreditation . E-4
- .40 Operate and use visual aids for instruction and training purposes. . . . E-5
- .41 Administer, proctor, score, record results and file tests used in the Coast Guard. . . . . E-5
- .42 Advise personnel of availability and methods of procuring training, educational and informational publications and aids. . . . . E-5
- .80 Construct and administer elementary achievement tests. . . . . E-7
- .81 Evaluate information obtained through testing and counseling; advise as to program of study. . . . . E-7
- .82 Supervise and train personnel in public speaking and group discussion methods and techniques . . . . . E-7
- .83 Organize, plan and direct workflow; develop training programs. . . . . E-7

2.00 Examination Factors

- .01 Administration of tests used in the Coast Guard, including types, uses, scoring and handling . . . . . E-4
- .40 Interpretation of raw scores, including standard score computation and conversion table . . . . . E-5
- .41 Use and interpretation of USAFI tests. . . . . E-5
- .42 Tests used in selection, cutting scores and their relation to service school and billet assignment including retest procedures . . . . . E-5
- .43 Programs leading to higher education and/or commissioned rank. . . . . E-5
- .44 General content and use of Information and Education Manual and other publications pertinent to USAFI. . . . . E-5
- .45 Service school eligibility, training courses and other sources of educational material, including USAFI. . . . . E-5
- .60 Public speaking and group discussion methods and techniques. . . . . E-6

C. PERSONNEL CLASSIFICATION

1.00 Practical Factors

- .40 Evaluate and recommend assignment of enlisted personnel giving consideration to education, occupational background and interests and to test scores. . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
FN

C. PERSONNEL CLASSIFICATION - Continued

1.00 Practical Factors - Continued

- .60 Make recommendations for assignment, training, education or reenlistment . . . . . E-6
- .61 Prepare and give information lectures concerning Coast Guard schools, billets, training, educational opportunities and advantages of a Coast Guard career . . . . . E-6
- .62 Construct an Enlisted Classification Record at recruit level and on authorized retest occasion . . . . . E-6
- .80 Supervise and train personnel in use of Coast Guard enlisted classification codes; advise in coding of more difficult classification cases . . . . . E-7

2.00 Examination Factors

- .01 Officer ranks, abbreviations and grades; titles, abbreviations, classifications by paygrade and job content of enlisted rates and ratings . . E-4
- .02 Principles and techniques of interviewing. . . . . E-4
- .60 General content and usage of Dictionary of Occupational Titles . . . . . E-6
- .62 Enlisted occupational classification structure and special qualifications including interrelationship of civilian occupations and Coast Guard ratings; use of vocational information materials. . . . . E-6
- .63 Purposes, procedures and techniques used in classification interviewing and vocational and educational counseling. . . . . E-6

D. PERSONAL AFFAIRS, MORALE AND BENEFITS

1.00 Practical Factors

- .40 Counsel personnel regarding rights and benefits. . . . . E-5

2.00 Examination Factors

- .40 Official publications and directives on rights, benefits and services available to active and retired Coast Guard personnel and their dependents . . . . . E-5
- .59 Coast Guard policy regarding:
  - a. Morale services. . . . . E-5
  - b. Agencies indirectly associated with morale services. . . . . E-6

E. MANAGEMENT ANALYSIS

1.00 Practical Factors

- .80 Conduct occupational analysis and prepare billet specifications and related forms and reports. . . . . E-7
- .81 Conduct organizational analysis such as organization, planning and charting, work simplification and work measurement; prepare survey reports. . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PN

E. MANAGEMENT ANALYSIS - Continued

1.00 Practical Factors - Continued

.82 Conduct staffing surveys aboard ships and stations; recommend changes to manpower authorization, prepare staffing guides and prepare justifications for quantitative and qualitative manpower requirements. . E-7

2.00 Examination Factors

.40 Purpose and organization of Coast Guard Reserve. . . . . E-5

.60 Methods and procedures for recommending establishment of or changes to manpower authorizations. . . . . E-6

.80 Purposes, procedures and techniques used in organizational analysis and planning, survey procedures and report writing . . . . . E-7

★ RADIOMAN (RM)

GENERAL RATING

SCOPE

Radiomen transmit, receive, and process all forms of record and voice communications through various transmission media, applying the basic principles of reliability, security, and speed in accordance with appropriate doctrinal and procedural publications; operate assigned communications transmission, reception, and terminal equipment; advise on capabilities, limitations, and condition of assigned equipment, applying knowledge of basic electronic and operational system theory; and perform assigned preventative maintenance on communications equipment and systems.

SERVICE RATING

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RM

A. ADMINISTRATION AND ORGANIZATION

1.00 Practical Factors

- .01 Perform routine clerical duties of a communication office ..... E-4
- .40 Supervise communication watch ..... E-5
- .60 Train, drill and supervise radiomen at cruising watches and general quarters stations ..... E-6
- .61 Instruct and supervise personnel in communication operation and procedure ..... E-6
- .80 Organize duties and assign communications personnel to tasks to be performed aboard ship or shore station ..... E-7
- .81 Serve as assistant to Communications Officer ..... E-7
- .82 Plan, organize, and supervise communications activities in compliance with operations orders, sail orders, battle orders, and other directives ..... E-7

2.00 Examination Factors

- .01 Standard shipboard communications organization ..... E-4
- .02 Missions, policies and fundamental considerations of Coast Guard and naval communications as outlined in CG-233, DNC 5, and NWP 16 ..... E-4
- .03 Organization of the Coast Guard Communications System ..... E-4
- .40 Organization of Navy and other Military communication systems as related to the Coast Guard ..... E-5
- .41 Organization of commercial communication systems as related to the Coast Guard ..... E-5
- .80 Planning, organizing and supervising training programs ..... E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RM

B. HISTORIES, RECORDS AND REPORTS

1.00 Practical Factors

- .01 Demonstrate ability to maintain registered mail log ..... E-4
- .40 Keep required supervisory logs ..... E-5
- .41 Keep maintenance and operational logs for radio  
equipment ..... E-5
- .42 Develop and maintain adequate records for the preparation  
of, and prepare a communication summary, interference,  
violation, and abstract of commercial traffic reports ..... E-5
- .60 Prepare requests for survey; requisition equipment,  
parts and supplies ..... E-6
- .61 Prepare shipyard work requests ..... E-6
- .62 Prepare an encrypted traffic report for his unit ..... E-6

2.00 Examination Factors

- .01 Uses of and procedures for preparing operating and admin-  
istrative logs ..... E-4
- .40 Basic knowledge of uses of Electronic Installation Change  
and Maintenance Reports ..... E-5
- .41 Uses of and procedures for preparing Communication Summary,  
interference, violation, and abstract of commercial  
traffic reports ..... E-5
- .60 Basic knowledge of types, purposes and entries made in  
equipment histories ..... E-6
- .61 Uses of and procedures for preparing encrypted traffic  
reports ..... E-6

C. PUBLICATIONS AND DEVICES

1.00 Practical Factors

- .01 Maintain communications publications ..... E-4
- .02 Observe regulations governing communication procedures and  
use of the Radio Regulations (Geneva) and Coast Guard, Navy,  
Joint and Allied publications in transmitting and re-  
ceiving traffic on Coast Guard and Naval circuits ..... E-4
- .03 Use call-sign cipher devices ..... E-4
- .04 Authenticate on radiotelephone, radiotelegraph and radio-  
teletype circuits ..... E-4
- .05 Demonstrate an ability to quickly locate information con-  
tained in the COMTAC Publications allowance at his duty  
station ..... E-4
- .06 Demonstrate an ability to properly utilize appropriate  
propagation publications, tables, etc. located at his  
duty station ..... E-4



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RM

C. PUBLICATIONS AND DEVICES - Continued

1.00 Practical Factors - Continued

- .07 Demonstrate an ability to effectively utilize and be thoroughly familiar with the contents of CG-233, CG-233-1, and applicable communication directives ..... E-4
- .40 Demonstrate an ability to properly maintain the COMTAC Publication Library at his unit ..... E-5

2.00 Examination Factors

- .01 Procedures for entering various types of corrections in communications publications ..... E-4
- .02 Authority for, methods of promulgation of and entry of various types of corrections in communications publications .. E-4
- .03 General content and application of CG-233, CG-233-1, Radio Regulations (Manual for use by the Maritime Mobile Service, Geneva) and Navy, Joint, and Allied publications used in naval, military, commercial, and international communications ..... E-4
- .40 Utilization of communication annexes to operation orders ..... E-5
- .60 Understanding of operation orders ..... E-6

D. TRAFFIC HANDLING

1.00 Practical Factors

- .01 Prepare in naval form plaindress, abbreviated plaindress and codress messages for transmission ..... E-4
- .02 Perform communication procedures prescribed for transmitting and receiving traffic on Coast Guard and Naval communication circuits (including use of call signs, address groups, address indicating groups, prosigns, routing indicators, prowords and operating signals) ..... E-4
- .03 Stand watch on distress circuits at his unit keeping the required logs ..... E-4
- .04 Transmit and receive on radiotelephone circuits using standard procedures and keeping required logs ..... E-4
- .05 Stand watch on teletypewriter circuit, keeping required logs ..... E-4
- .06 Operate telegraphic typewriter using touch system at approximately 40 words per minute ..... E-4
- .07 Process, route, and file all traffic to and from own ship or station ..... E-4
- .08 Prepare international and domestic telegraph messages in commercial form ..... E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RM

D. TRAFFIC HANDLING - Continued

1.00 Practical Factors - Continued

- .39 Transmit and receive on a typical Coast Guard CW Circuit using standard procedures (keeping required logs) and handling traffic at approximately:
  - a. 18 words per minute ..... E-4
  - b. 25 words per minute ..... E-5

2.00 Examination Factors

- .01 Forms, types, classes and construction of messages ..... E-4
- .02 Significance of precedence in traffic handling ..... E-4
- .03 Regulations governing circuit discipline on radiotelegraphy, radiotelephone, and radio and landline teletypewriter circuits ..... E-4
- .04 International radio procedures; regulations regarding communications as prescribed for the safety of life at sea ..... E-4
- .05 Regulations for sending messages involving tolls ..... E-4
- .06 Communication procedures prescribed for transmitting and receiving traffic on all naval communication circuits including use of call signs, address groups, address indicating groups, prosigns, routing indicators, prowords and operating signals ..... E-4
- .07 Time zone computations and conversions ..... E-4
- .08 Construction and processing of service messages ..... E-4
- .09 Description of AUTODIN, AUTOVON, AUTOSEVOCOM, and major Coast Guard landline networks ..... E-4
- .10 Basic understanding of overall Coast Guard Communication System ..... E-4
- .40 Commercial traffic instructions and procedures related to Coast Guard and naval communications ..... E-5
- .41 Tracer procedures ..... E-5
- .42 Commercial accounting and abstracting as used by the Coast Guard ..... E-5

E. RADIO THEORY

1.00 Practical Factors

- .40 Demonstrate a general understanding of basic radio circuits such as amplifiers, oscillators, mixers and rectifiers ..... E-5
- .60 Instruct personnel in basic radio theory ..... E-6

2.00 Examination Factors

- .01 Definitions of common electrical and electronic terms used with radio equipment such as volt, ohm, ampere, watt, Hertz, frequency, wave length, phase, resonance, selectivity sensitivity, stability, FSK, tone modulation, AM, FM, SSB, etc. .... E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RM

E. RADIO THEORY - Continued

2.00 Examination Factors - Continued

- .02 Meaning of terms commonly used in connection with manipulation of radio and related equipment such as heterodyning, antenna loading, harmonics, standing wave ratio, tuning, zero beating, calibrating, audio-band-pass and intermediate frequency band-pass ..... E-4
- .03 Identification of symbols used in schematic diagrams of radio equipment ..... E-4
- .04 Relationship between voltage, resistance, current and power ..... E-4
- .05 Fundamental concepts of radio wave propagation, including skip distance, skywave and groundwave; and the effect of the ionosphere on radio wave propagation ..... E-4
- .40 Basic functions, physical structure and operating principles of electron tubes, transistors, and integrated circuits in radio equipment ..... E-5
- .41 Functions of basic circuits such as rectifiers, amplifiers, oscillators, detectors, mixers and band-pass filters ..... E-5
- .42 Relationship of wavelength and antenna length of frequency ..... E-5
- .43 Theory of operation of basic antennas and transmission lines ..... E-5
- .60 Reading and interpreting block diagrams of communication systems ..... E-6
- .80 Theories and principles behind all major Coast Guard communications systems ..... E-7

F. SAFETY

1.00 Practical Factors

- .01 Demonstrate under simulated conditions the rescue of a person in contact with an energized electrical circuit, resuscitation of a person unconscious from electrical shock and treatment for electrical burns ..... E-4
- .02 Demonstrate while servicing equipment safety precautions such as tagging switches, removing fuses, grounding test equipment, using shorting bars and rubber mats ..... E-4
- .03 Observe safety precautions when operating and maintaining electronic equipment ..... E-4

2.00 Examination Factors

- .01 Safety precautions to be observed while working aloft ..... E-4
- .02 Knowledge of the relationship between body resistance, dangerous current levels and applied EMF ..... E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RM

G. EQUIPMENT NOMENCLATURE AND OPERATION

1.00 Practical Factors

- .01 Identify communications antennas at his unit ..... E-4
- .02 Set up an antenna patch panel and select proper antenna  
matching equipment for receiving and transmitting ..... E-4
- .03 Set up radio patch panel and patch transmitters and  
receivers into remote units ..... E-4
- .04 Tune transmitter using dummy antenna ..... E-4
- .05 Tune radio receivers and associated teletypewriter,  
cryptographic, and terminal equipment for teletypewriter  
reception ..... E-4
- .06 Start, stop and operate manual and automatic teletype-  
writer equipment ..... E-4
- .07 Assemble, energize, deenergize, tune and make operating  
adjustments to emergency and/or portable radio equipment  
including emergency antennas ..... E-4
- .08 Compare frequency standard against National Bureau of  
Standards Radio Station (WWV) and log results ..... E-4
- .09 Tune radio transmitters and associated teletypewriter,  
cryptographic, and terminal equipment for teletypewriter  
transmission ..... E-4
- .10 Operate radio direction finder ..... E-4
- .11 Start, stop, tune and operate facsimile equipment which is  
assigned to own ship or station ..... E-4
- .12 Demonstrate procedures for receiving through electronic  
and other types of interference ..... E-4
- .40 Tune and adjust multicouplers and antenna matching equip-  
ment and select antennas for transmitting ..... E-5
- .41 Start, stop, operate, and tune all radio equipment and  
associated communications equipment ..... E-5
- .60 Instruct and supervise the operation, adjustment, patching  
and frequency monitoring of equipment involved in secure  
communication systems ..... E-6

2.00 Examination Factors

- .01 Types and functions of radio receiving and transmitting  
equipment ..... E-4
- .02 Purposes of common external controls on radio transmitting,  
receiving, and associated terminal equipment ..... E-4
- .03 Procedures to be followed in tuning radio transmitting and  
receiving equipment ..... E-4
- .40 Operating principles, and application of various types of  
teletypewriters, radiotelephones and teletypewriters  
terminal equipment ..... E-5
- .41 Capabilities, limitations, and nomenclature of communi-  
cations equipments ..... E-5
- .42 Capabilities, limitations, and nomenclature of communication  
systems ..... E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RM

G. EQUIPMENT NOMENCLATURE AND OPERATION - Continued

2.00 Examination Factors - Continued

- .43 Types and uses of common antennas ..... E-5
- .44 Radio direction finding as utilized in interception of  
electronic emissions ..... E-5

H. COMMUNICATIONS SYSTEMS SUPPORT

1.00 Practical Factors

- .01 Clean and lubricate typewriters; change ribbons ..... E-4
- .02 Change ribbons, paper, and tape on teletypewriters ..... E-4
- .03 Energize, deenergize and make operational adjustments on  
radio receivers, transmitters, terminal equipments, and  
associated motors and motor generators ..... E-4
- .04 Locate and identify units and component parts of radio  
and communication systems ..... E-4
- .05 Inspect, clean, lubricate and make adjustments on  
assigned radio associated communications equipment as  
specified in routine preventative maintenance check-off  
lists ..... E-4
- .06 Check and replace indicator lamps, electron tubes, fixed  
fuses, switches, crystals and jacks ..... E-4
- .07 Identify circuits affected by operation of associated  
external controls by reference to block diagrams ..... E-4
- .08 Demonstrate procedures for conducting and logging  
antenna insulation resistance tests ..... E-4
- .40 Locate and identify maintenance test points and make  
tests on equipment to which assigned as specified in  
technical manuals as a part of the preventative main-  
tenance program ..... E-5
- .61 Locate electrical and electronic failures employing  
system check-out procedures to isolate imperative  
sections of communication equipment ..... E-6
- .62 Demonstrate measures to be taken to restore assigned  
communication facilities due to battle casualty and  
under other emergency conditions including fire, per-  
sonnel injuries, and loss of or damage to communication  
equipment ..... E-6
- .63 Supervise and train personnel in performing preventive  
maintenance on communication equipment ..... E-6
- .64 Supervise and train personnel in performing frequency  
measurement and monitor functions ..... E-6
- .80 Coordinate maintenance efforts to restore equipment to  
optimum operating condition ..... E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RM

H. COMMUNICATIONS SYSTEMS SUPPORT - Continued

2.00 Examination Factors

- .01 Purpose of and procedures for conducting antenna maintenance to insure optimum performance ..... E-4
- .61 Planning, organizing and supervising a preventative maintenance program ..... E-6

I. PERFORMANCE TESTS

1.00 Practical Factors

- .38 Transmitting by: (See Performance Test Instructions)
  - a. Telegraph (CW radio-international Morse):
    - (1) A file (containing 500 characters) of 3 messages in 8 minutes ..... E-4
    - (2) A file (containing 600 characters) of 4 messages in 8 minutes ..... E-5
  - b. Teletypewriter:
    - (1) A file (containing 600 characters) of 3 messages in 9 minutes ..... E-4
    - (2) A file (containing 750 characters) of 4 messages in 9 minutes ..... E-5
    - (3) A file (containing 1200 characters) of 5 messages in 9 minutes ..... E-6
- .39 Receiving: (See Performance Test Instructions)
  - a. Telegraphy (CW radio-international Morse):
    - (1) A file (containing 600 characters) of 4 messages in 8 minutes ..... E-4
    - (2) A file (containing 700 characters) of 5 messages in 8 minutes ..... E-5

2.00 Examination Factors

None.

J. SECURITY

1.00 Practical Factors

- .01 Demonstrate working knowledge of local material control system at own ship or station ..... E-4
- .02 Demonstrate working knowledge of emergency action plan at own ship or station ..... E-4
- .40 Demonstrate a basic understanding of the commonly used systems for the distribution of classified material, i.e., RPS, COMTAC, locally controlled material, etc..... E-5
- .41 Demonstrate a knowledge of allowances for publications and instructions in the local control system and COMTAC system on board your own ship or station ..... E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RM

J. SECURITY - Continued

2.00	Examination Factors	
.01	Purpose of the security program .....	E-4
.02	Methods used by agents of foreign governments to subvert U. S. Military personnel .....	E-4
.03	Disciplinary action resulting from violations of security regulations .....	E-4
.04	Regulations for custody, control and accounting for classified material .....	E-4
.05	Need-to-know .....	E-4
.06	Circulation and control of classified material .....	E-4
.07	Methods for the destruction of classified material and duties of the witnessing official .....	E-4
.08	Principles of, and requirements for, communication security as prescribed in the Department of the Navy Security Manual for Classified Information, DNC 5, ACP 122, and NWP 16 .....	E-4
.09	Security classifications and regulations governing trans- mission of each category of classified information .....	E-4
.10	Physical security requirements and other safeguards of registered or other classified matter .....	E-4
.11	Emergency destruction bills for classified material and procedures for effecting destruction .....	E-4
.40	Regulations for dissemination and accounting for Top Secret material .....	E-5
.41	Rules covering disclosure of classified information .....	E-5
.42	Responsibility for determining security classification of information .....	E-5
.43	Basic principles governing Automatic Downgrading and De- classification program .....	E-5
.44	Procedures for initiating security clearance and background investigation .....	E-5

SENIOR CHIEF RADIOMAN (RMCS)

QUALIFICATIONS FOR ADVANCEMENT

1.00	Practical Factors	
.90	Plan, organize, and supervise communications activities in compliance with operations orders, sail orders, battle orders, and other directives .....	E-8
.91	Prepare for signature local instructions for the observance of appropriate security regulations .....	E-8
.92	Prepare technical reports dealing with operational characteristics of assigned electronics equipment .....	E-8
.93	Test and evaluate against operational design standards all newly installed communications equipment .....	E-8

SENIOR CHIEF RADIOMAN (RMCS) - Continued

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
RM

2.00 Examination Factors

- .90 Procedures, methods, and functions of crypto board operations ..... E-8
- .91 Effects of environmental conditions on electronic equipment  
and special techniques for operating equipment under conditions  
of climatic extremes ..... E-8

MASTER CHIEF RADIOMAN (RMCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Establish a communication training program for non-RM communication  
watchstanders and the general boating public ..... E-9

2.00 Examination Factors

- .95 Functions, organization, and administration of all aspects of the  
Coast Guard communication system ..... E-9
- .96 Principles of operation, management, and administration of a  
Coast Guard Communications Center and Radio Station ..... E-9



STEWARD (SD)

GENERAL RATING

SCOPE

Stewards operate and manage commissioned officers' messes; cook, bake, and serve meals; prepare menus and order subsistence items; stow food products; maintain refrigerated spaces and assigned storerooms; estimate quantities and kinds of foodstuffs required; maintain officers' living quarters; and maintain records and keep books of financial transactions.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SD

A. SANITATION AND SAFETY

1.00 Practical Factors

- .01 Keep spaces and equipment in a clean and sanitary condition . . . . . E-4
- .02 Observe all safety precautions in handling food preparation equipment. . E-4
- .40 Supervise sanitation procedures in the officers' mess spaces . . . . . E-5

2.00 Examination Factors

- .01 Sanitary and safety precautions for the stowage, issue, preparation, and service of food . . . . . E-4
- .02 Basic causes of food poisoning and precautions to be observed . . . . . E-4
- .03 Methods and materials used in pest and rodent control . . . . . E-4
- .04 Safety precautions to be observed in the use of galley and pantry equipment . . . . . E-4
- .40 Food service precautions during Nuclear, Biological and Chemical (NBC) warfare . . . . . E-5

B. UTENSILS AND EQUIPMENT

1.00 Practical Factors

- .01 Operate galley ranges, ovens, and mechanical equipment used in the preparation of food . . . . . E-4

2.00 Examination Factors

- .40 Methods of obtaining and accounting for cooking utensils and galley and pantry equipment . . . . . E-5
- .60 Current regulations for inventory of equipage assigned to officers' mess . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SD

C. FOOD PREPARATION

1.00 Practical Factors

- .01 Convert units of measure and define terms commonly used in recipes . . . E-4
- .02 Prepare soups, vegetables, meats, salads, and desserts using the Navy-Marine Corps Recipe Service . . . E-4
- .03 Bake breads, pies, cakes, and simple pastries; and prepare desserts, using the Navy-Marine Corps Recipe Service . . . E-4
- .04 Prepare meats, seafood, and poultry for various uses (Does not include cutting of whole, halves, or quarters of carcasses.) . . . E-4
- .05 Carve meat and poultry for serving . . . E-4
- .40 Bake two or more complex breads, pies, cakes, or pastries selected from the Navy-Marine Corps Recipe Service . . . E-5
- .41 Plan tasks and use of galley and pantry equipment to meet mealtime schedules . . . E-5

2.00 Examination Factors

- .01 Conversion by calculation of quantities given in Navy-Marine Corps Recipe Service for 100 men into quantities required for groups of other sizes . . . E-4
- .02 Common words and phrases used to describe foods and food services . . . E-4
- .03 Uses of various types of boneless meats . . . E-4
- .04 Uses of bones and fat trimmings from uncooked meats . . . E-4
- .05 Procedures for handling, cutting, and thawing frozen meat, poultry, and seafood (Does not include cutting of whole, halves, or quarters of carcasses.) . . . E-4
- .40 Elements of short order cooking . . . E-5
- .41 Names, location on the carcass, and uses of various cuts of beef, lamb, veal, and pork . . . E-5
- .42 Grades of meat . . . E-5
- .43 Purpose and procedures for using and preparing ration dense foods . . . E-5
- .60 Preparation of food under battle conditions . . . E-6

D. PROCUREMENT, STORAGE, AND CONSERVATION OF SUBSISTENCE ITEMS

1.00 Practical Factors

- .01 Stow perishables and dry subsistence items in refrigerated spaces and storerooms . . . E-4
- .40 Estimate officers' mess requirements for cruises of various lengths and climate conditions . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SD

D. PROCUREMENT, STORAGE AND CONSERVATION OF SUBSISTENCE ITEMS - Continued

2.00 Examination Factors

- .01 Storage temperatures for subsistence items . . . . . E-4
- .02 Regulations regarding withdrawal of subsistence items from refrigerated spaces, bulk storerooms and subsistence issue rooms. . . . . E-4
- .03 Characteristics of spoiled food and procedures for survey. . . . . E-4
- .40 Expected storage life of foods under various conditions. . . . . E-5
- .41 Nomenclature, classification, units of measure and units of issue of subsistence and messing items. . . . . E-5
- .42 Methods of determining cost of subsistence items purchased from general mess . . . . . E-5
- .43 Conservation and utilization of food to reduce waste . . . . . E-5

E. MENUS

1.00 Practical Factors

- .40 Prepare menus for a balanced diet. . . . . E-5
- .60 Make a nutritional analysis of a menu using the Daily Food Guide . . . . E-6

2.00 Examination Factors

- .01 Basic classes of foods and the function of each in the diet. . . . . E-4
- .40 Functions and sources of vitamins and minerals . . . . . E-5

F. SERVICES

1.00 Practical Factors

- .01 Set up wardroom, serve food and clean staterooms . . . . . E-4
- .02 Make seating arrangements for officers and distinguished guests. . . . . E-4

2.00 Examination Factors

- .01 Precedence with respect to rank of Army, Navy, Air Force, Marine Corps, and Coast Guard personnel. . . . . E-4
- .41 Types of table settings and services . . . . . E-5

G. MESS MANAGEMENT

1.00 Practical Factors

- .01 Make simple arithmetical computations, using fractions, decimals and percentages. . . . . E-4
- .02 Write or print legibly and spell commonly used mess and supply terms . . E-4
- .40 Receive material and inspect for quality and quantity. . . . . E-5
- .60 Establish work schedules for the operation of a mess . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SD

G. MESS MANAGEMENT - Continued

1.00 Practical Factors - Continued

- .61 Precost the food menu to conform with the mess meal price structure. . . . . E-6
- .62 Maintain records and keep books of the financial transactions  
of the mess . . . . . E-6
- .80 Organize and administer a mess management training program . . . . . E-7

2.00 Examination Factors

- .01 Cash handling procedures, including preparation of daily  
activity reports . . . . . E-4
- .02 Methods and procedures for taking inventories . . . . . E-4
- .40 Purpose of and procedures for mess inspections . . . . . E-5
- .41 Purpose and function of stock records . . . . . E-5
- .42 Use and purpose of requisitioning procedures . . . . . E-5
- .43 Duties and responsibilities of mess officers, boards, and committees . . . . . E-5
- .60 General preparation and use of standard Coast Guard forms used in  
connection with officers' mess . . . . . E-6
- .61 Sources and methods used in procuring supplies for officers' mess . . . . . E-6
- .62 Purpose and necessity for internal control systems . . . . . E-6
- .63 Regulations governing allowances for quarters subsistence . . . . . E-6
- .64 Names, purposes, and general content of principal publications used  
in officers' mess operation. . . . . E-6
- .65 General organization of the officers' mess and the supply department . . . . . E-6
- .66 Methods of food cost control . . . . . E-6
- .67 Elements of budget operation . . . . . E-6
- .80 Principles of training programs . . . . . E-7

H. SUPERVISION

1.00 Practical Factors

- .40 Supervise Stewardsmen, ensuring good service, discipline, and  
personal cleanliness . . . . . E-5
- .41 Supervise food preparation and housekeeping . . . . . E-5
- .60 Plan, organize, and control work . . . . . E-6
- .61 Supervise and train personnel working in wardroom, staterooms,  
and officers' galley . . . . . E-6
- .80 Supervise the operation of a commissioned officers' mess CLOSED  
or a wardroom mess . . . . . E-7

2.00 Examination Factors

None.

★ SENIOR CHIEF STEWARD (SDCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement  
SD

1.00 Practical Factors

- .90 Train and supervise personnel for the following:
  - a. Sanitary precautions in food preparation and food service . . . . . E-8
  - b. Pest and rodent control . . . . . E-8
  - c. NBC Warfare . . . . . E-8
  - d. Maintenance of wardroom spaces . . . . . E-8
- .91 Train and supervise personnel in the correct operating and cleaning procedures for galley equipment, care and cleaning of utensils, and periodic scheduled and nonscheduled inspections and inventories . . . . . E-8
- .92 Train and supervise personnel in procedures for cutting, cleaning, and carving meat, poultry, and seafood. (Does not include cutting of whole, halves, or quarters of carcasses.) . . . . . E-8
- .93 Supervise subordinate personnel in the following:
  - a. Officers' mess requirements . . . . . E-8
  - b. Control of subsistence items, including loading, stowing, withdrawals, inventories, and accounting . . . . . E-8
  - c. Classification, identification, and units of measure and issue. . . . . E-8
- .94 Supervise and provide guidance to personnel in directing conformity with safety and sanitary precautions and regulations involving foods, services, and equipment . . . . . E-8

2.00 Examination Factors

None.

★ MASTER CHIEF STEWARD (SDCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Assist officers in determining requirements for subsistence items and for food service equipment for officers' mess functions . . . . . E-9
- .96 Supervise and ensure compliance with directives, publications, and instructions regarding officers' mess personnel . . . . . E-9
- .97 Indoctrinate subordinate personnel in organization and functions of Coast Guard supply activities both ashore and afloat . . . . . E-9
- .98 Prepare general correspondence concerning subsistence and administrative matters pertaining to wardroom and officers' mess . . . . . E-9
- .99 Serve as liaison man between local activities and ship or station supply department . . . . . E-9
- .991 Indoctrinate subordinate personnel in the organization and management of officers' messes both ashore and afloat . . . . . E-9

2.00 Examination Factors

None.

SHIP'S SERVICEMAN (SH)

SERVICE RATING

SCOPE

Ship's Servicemen operate and manage resale activities, such as ship's stores, commissary stores and Coast Guard exchanges; service activities of the ship's stores and Coast Guard exchanges, such as laundry and dry-cleaning facilities, vending machines, fountains, snackbars and photographic, barber, tailor and cobbler shops; and perform clerical and stock control functions for all activities operated. At paygrade E-4, Ship's Servicemen specialize as laundrymen, barbers, cobblers, tailors or store clerks; at paygrade E-5, develop and exercise administrative and managerial skills, in addition to progressing within their specialties; and at paygrades E-6 and above, manage resale and service activities.

NOTE: The parenthetical phrase "clerks; 1 & C" indicates that the particular qualification applies to store clerks for the rate indicated and all SH1 and SHC.

QUALIFICATIONS FOR ADVANCEMENT

Required for Advancement to SH

A. ORGANIZATION AND ADMINISTRATION

1.00 Practical Factors

- .60 Establish work schedules for service operations of ship's stores or Coast Guard exchanges. . . . . E-6
- .61 Prepare operating instructions for service and resale activities . . . . E-6
- .62 Make recommendations for overhaul or repair of equipment and spaces during shipyard or tender availability . . . . . E-6
- .63 Supervise operations of service and resale activities. . . . . E-6
- .64 Organize and supervise inventory teams . . . . . E-6
- .80 Plan workflow for resale and office operations . . . . . E-7
- .81 Plan physical layouts of service and resale activities to ensure work of good quality and efficient service. . . . . E-7

2.00 Examination Factors

- .01 Purpose of price changes . . . . . E-4
- .02 Regulations governing keys, locks and safe combinations. . . . . E-4
- .03 Regulations outlined emergency entry procedures. . . . . E-4
- .40 Regulations governing the computation and establishment of sales prices (clerks; 1 & C). . . . . E-5
- .41 Charges for services in ship's stores. . . . . E-5
- .60 General rules and regulations governing organization, administration, and operation of ship's store, exchange and commissary store activities. E-6
- .80 General organization and functions of the supply department. . . . . E-7
- .81 Regulations governing repair or alteration of equipment and buildings ashore . . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SH

B. APPROPRIATIONS AND EXPENDITURES

1.00 Practical Factors

- .01 Basic mathematics (clerks; 1 & C) . . . . . E-4
- .40 Prepare expenditure documents (clerks; 1 & C). . . . . E-5
- .41 Issue and/or transfer stock in accordance with current regulations (clerks; 1 & C). . . . . E-5
- .42 Process claims for loss of, or damage to, items accepted for servicing by ship's stores and Coast Guard exchange (clerks; 1 & C). . . . . E-5
- .60 Recommend for survey or markdown, items of ship's store, commissary store and exchange stock . . . . . E-6

2.00 Examination Factors

- .01 Regulations governing the sale of stock. . . . . E-4
- .02 Procedures for expending stock by survey . . . . . E-4
- .03 Regulations governing the use of appropriations and funds. . . . . E-4
- .40 Expenditure accounts and their uses (clerks; 1 & C). . . . . E-5
- .41 Titles and symbols of appropriations and funds (clerks; 1 & C) . . . . . E-5
- .80 Procedures for expending other supplies under the inventory control of the supply department . . . . . E-7

C. PROCUREMENT AND STOCK CONTROL

1.00 Practical Factors

- .01 Prepare requisitions and purchase orders (clerks; 1 & C) . . . . . E-4
- .02 Post inventories to stock and financial records (clerks; 1 & C). . . . . E-4
- .03 Estimate stock requirements and prepare issue requests for supplies required for operation of activity peculiar to own trade . . . . . E-4
- .60 Estimate stock required by unusual operating conditions and localities . E-6
- .61 Contact suppliers for information on price, quantity, quality and manner of delivery of items to be purchased . . . . . E-6
- .80 Recommend sales prices which will cover overhead and return the prescribed profit. . . . . E-7

2.00 Examination Factors

- .01 Forms and their uses in stock control (clerks; 1 & C). . . . . E-4
- .02 Purpose of inventories . . . . . E-4
- .03 Preparation and maintenance of stock records and returns areas (clerks; 1 & C) . . . . . E-4
- .40 Methods and sources of procurement for standard and special resale stock and supplies for ship's store and commissary store . . . . . E-5
- .41 Methods and procedures for taking inventories. . . . . E-5
- .42 Methods and sources of procurement for standard and special resale stock and supplies for Coast Guard exchanges (clerks; 1 & C) . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SH

C. PROCUREMENT AND STOCK CONTROL - Continued

2.00 Examination Factors

- .60 Receipt and expenditure entries required in stock and financial records E-6
- .61 Procedures for reconciling invoices and balancing stock and financial records. . . . . E-6
- .62 Procedures for initiating procurement action for major equipment . . . . E-6
- .63 Methods of procuring commercial services . . . . . E-6
- .80 Methods and sources of procurement for other supplies under the inventory control of the supply department . . . . . E-7

D. RECEIPTS, CUSTODY AND STOWAGE

1.00 Practical Factors

- .01 Receive material and inspect for quality and quantity. . . . . E-4
- .02 Identify and classify stock for purposes of marking and stowing. . . . . E-4
- .03 Stow stock so as to minimize damage, deterioration and pilferage . . . . E-4
- .40 Supervise working parties engaged in handling stock. . . . . E-5
- .60 Prepare stowage plans. . . . . E-6

2.00 Examination Factors

- .01 Procedures for establishing accountability for stocks and funds. . . . . E-4
- .02 Purpose and disposition of receipt documents (clerks; 1 & C) . . . . . E-4
- .03 Procedures for marking resale stock and supplies . . . . . E-4
- .04 Safety classifications of materials. . . . . E-4
- .05 Procedures for processing dealers' bills (clerks; 1 & C) . . . . . E-4
- .06 Purpose of proper receiving and marking in inventories and accounting (clerks; 1 & C). . . . . E-4

E. REPORTS AND CORRESPONDENCE

1.00 Practical Factors

- .01 File correspondence in accordance with Coast Guard filing system; type standard Coast Guard letter and business letter (clerks; 1 & C). . . . . E-4
- .39 Typewrite at: (See Performance Test Instructions)
  - a. 20 words per minute (clerks & first class) . . . . . E-4
  - b. 25 words per minute (clerks only). . . . . E-5
- .40 Prepare and assemble returns required (clerks; 1 & C). . . . . E-5
- .60 Audit returns required . . . . . E-6
- .61 Prepare required internal stock and financial reports. . . . . E-6
- .62 Compose and initiate correspondence. . . . . E-6
- .80 Prepare required returns for ship's stores, exchanges and commissary stores . . . . . E-7



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SH

E. REPORTS AND CORRESPONDENCE - Continued

2.00 Examination Factors

- .01 Retention periods and disposition of files and records (clerks; 1 & C) . . . . . E-4
- .40 Official letter format including endorsements (clerks; 1 & C). . . . . E-5
- .60 Regulations and instructions pertaining to preparation, routing and forwarding of exchange, ship's store and commissary store correspondence . . . . . E-6

F. COMMON SERVICE OPERATIONS

1.00 Practical Factors

- .01 Operate equipment, explain safety precautions and use supplies common to own trade. . . . . E-4
- .02 Identify principal parts of equipment common to own trade. . . . . E-4
- .03 Provide services to customers common to own trade. . . . . E-4
- .04 Press clothing by hand and machine (laundrymen and tailors). . . . . E-4
- .05 Spot and remove common stains from clothing (laundrymen and tailors) . . . . . E-4
- .06 Perform minor maintenance and make minor adjustments on equipment used in own trade . . . . . E-4
- .07 Observe station regulations and usual practices pertaining to operation of activity peculiar to own trade. . . . . E-4
- .40 Determine equipment requirements for efficient operation of activity peculiar to own specialty. . . . . E-5
- .41 Schedule operations common to own trade. . . . . E-5
- .42 Supervise activity peculiar to own trade . . . . . E-5
- .43 Instruct and train personnel in duties of own trade. . . . . E-5

2.00 Examination Factors

- .01 Sanitary and safety precautions applicable to own trade. . . . . E-4
- .02 Nomenclature, types and characteristics of:
  - a. Supplies common to own trade . . . . . E-4
  - b. Materials serviced in performance of own trade (cobblers, laundrymen, tailors) . . . . . E-4
- .03 Regulations peculiar to own trade. . . . . E-4
- .04 Working principles of machines peculiar to own trade . . . . . E-4
- .05 Effect of heat, stain removers and clean solvents on various fabrics (laundrymen and tailors) . . . . . E-4
- .40 Organization, layout, procedures and practices to ensure work of good quality and efficient service to patrons in shop, store or activity peculiar to own trade. . . . . E-5

G. CLERK  
(Clerks only)

1.00 Practical Factors

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SH

G. CLERK - Continued  
(Clerks only)

1.00 Practical Factors - Continued

- .01 Operate, maintain and stock soda fountain, observing sanitary and safety precautions. . . . . E-4
- .02 Service vending machines . . . . . E-4
- .03 Maintain required salesroom and stockroom records. . . . . E-4
- .04 Maintain fountain and vending machine records. . . . . E-4
- .05 Operate adding machines and calculators. . . . . E-4
- .06 Construct merchandise display. . . . . E-4

2.00 Examination Factors

- .01 Cash register and cash handling procedures . . . . . E-4
- .02 Principles of displaying merchandise . . . . . E-4

H. LAUNDERING

1.00 Practical Factors

- .01 Mark, list and sort clothing . . . . . E-4
- .02 Wash clothing and other washable materials . . . . . E-4
- .03 Feed and fold flatwork and press outer wearing apparel . . . . . E-4
- .40 Identify types of clothing damage, determine causes and take corrective action . . . . . E-5
- .41 Sanitize and decontaminate clothing and fabrics with laundry equipment . . . . . E-5

2.00 Examination Factors

- .01 Standard washing formulas for articles commonly laundered in a Coast Guard laundry. . . . . E-4
- .02 Recognition of washers and extractors characteristics to prevent damage to the equipment. . . . . E-4
- .40 Substitutions and modifications for standard washing formulas. . . . . E-5
- .41 Stain removal and effect of stain removing agents on various fabrics and fibers . . . . . E-5
- .42 Methods of dry cleaning, decontaminating and deodorizing clothing and nonwashable materials. . . . . E-5
- .43 Methods of pressing and finishing dry cleaned garments . . . . . E-5

I. BARBERING  
(Barbers only)

1.00 Practical Factors

- .01 Cut hair and perform other barbering services. . . . . E-4

2.00 Examination Factors

- .40 Symptoms of common skin and scalp diseases . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SH

J. TAILORING  
(Tailors only)

1.00 Practical Factors

- .01 Preserve and care for uniforms in various climates . . . . . E-4
- .02 Sew by hand and machine. . . . . E-4
- .03 Sew insignia and fasteners on uniforms . . . . . E-4
- .04 Perform minor alterations and repairs on uniforms. . . . . E-4
- .05 Make up ribbons and medals . . . . . E-4
- .06 Press garments for return to customers . . . . . E-4
- .40 Fit uniforms to customers . . . . . E-5

2.00 Examination Factors

- .40 Construction of uniforms . . . . . E-5
- .41 Authorized insignia and alterations. . . . . E-5
- .42 Special treatment required to alter and mend fabrics . . . . . E-5
- .43 Proper care and preservation of clothing in various climates; types of  
hand and machine alterations necessary to make repairs to clothing . . . E-5

K. COBBLER  
(Cobblers only)

1.00 Practical Factors

- .01 Repair shoes; install new heels and soles. . . . . E-4
- .40 Repair leather goods, other than shoes, commonly used in the Coast Guard E-5
- .41 Rewelt and rebuild shoes . . . . . E-5

2.00 Examination Factors

- .01 Construction of shoes. . . . . E-4
- .02 Operations required for repair of shoes and preparation of shoes  
before repairing . . . . . E-4

STOREKEEPER (SK)

GENERAL RATING

SCOPE

Storekeepers open, maintain, and close military pay records; prepare payroll certification sheets and money lists; prepare public vouchers, transportation requests, and meal tickets; furnish information on and register allotments, allowances; prepare returns covering receipts and expenditures of public monies; order, receive, inspect, stow, preserve, package, ship, and issue materials and cargo; account for property equipage, supplies, and materials (exclusive of aviation equipage, supplies, and materials) belonging to the Coast Guard; and prepare and maintain all required forms, records, correspondence, reports, and files.

SERVICE RATING (PO3 and PO2)

SCOPE

DISBURSING CLERK - DK

Disbursing Clerks open, maintain, and close military pay records; prepare payroll certification sheets and money lists; prepare public vouchers, transportation requests, and meal tickets; register and furnish information on allotments, allowances, and savings deposits; and prepare returns covering receipts and expenditures of public monies.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SK DK

A. ADMINISTRATION, SECURITY, AND CLERICAL PERFORMANCE

1.00 Practical Factors

.01 Operate and perform operational maintenance on typewriters, adding machines, calculators, graphotypes, addressographs, and duplicating machines . . . . .	E-4	E-4
.02 Write or print legibly, record numbers neatly and accurately; correctly spell words commonly used in supply work . . . . .	E-4	E-4
.03 Prepare, route, and file correspondence and frequently used forms in accordance with current instructions . . . . .	E-4	E-4
.04 Procure office forms and supplies . . . . .	E-4	E-4
.05 Complete forms commonly used in supply procedures . . . . .	E-4	-
.06 Use and maintain the principal publications of a supply department . . . . .	E-4	E-4
.39 Typewrite for 5 minutes: (See Performance Test Instructions)		
a. At 20 words per minute . . . . .	E-4	E-4
b. At 30 words per minute . . . . .	E-5	E-5
c. At 40 words per minute . . . . .	E-6	-
.40 Exercise control over department publications by supervising maintenance, by ascertaining that changes are being received, and by ensuring that the department is adequately supplied with necessary publications . . . . .	E-5	E-5
.41 Dispose of obsolete files and publications in conformity with existing regulations . . . . .	E-5	-
.42 Initiate routine correspondence . . . . .	E-5	E-5
.43 Prepare, log, route, and file classified matter in accordance with current instructions . . . . .	E-5	E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SK DK

A. ADMINISTRATION, SECURITY, AND CLERICAL PERFORMANCE - Continued

1.00 Practical Factors - Continued

- .60 Establish a correspondence filing system in accordance with the Coast Guard filing system . . . . . E-6 -
- .61 Direct others in the use of pertinent publications . . . . . E-6 -
- .62 Assign, supervise, and train supply personnel according to training and operating instructions . . . . . E-6 -
- .80 Prepare operating instructions pertaining to functions of the office, issue rooms, storerooms, retail clothing store, and disbursing office . . . . . E-7 -
- .81 Lay out physical areas of offices, issue rooms, storerooms, and retail clothing store to facilitate efficient operation . . . . . E-7 -

2.00 Examination Factors

- .01 Names, purposes, and general content of principal publications used in supply and disbursing work . . . . . E-4 E-4
- .02 Standard organization and functions of supply departments with emphasis on their relationship to disbursing activities . . . . . E-4 E-4
- .03 Essential differences in supply procedures between ships with or without supply officers attached . . . . . E-4 -
- .04 Regulations pertaining to handling combinations and keys to locks to supply department spaces, security of material and records, and of pilferable supplies such as retail clothing and subsistence items . . . . . E-4 -
- .60 Relationship of a disbursing activity to other United States Government fiscal agencies whose regulations affect disbursing procedures . . . . . E-6 -
- .61 Functions of the several Coast Guard supply systems including electronics, aviation, ordnance, general stores, and retail clothing . . . . . E-6 -
- .62 Operation and functions of clothing and small stores and general messes and their effects on authorized certifying officer's accounts . . . . . E-6 -
- .80 General organization and functions of officers' messes . . . . . E-7 -
- .81 General organization and functions of the supply department, including disbursing, commissary, clothing and small stores, and officers' mess afloat . . . . . E-7 -

B. APPROPRIATIONS, ALLOTMENTS, ACCOUNTS, AND FUNDS

1.00 Practical Factors

- .01 Utilize appropriations and funds associated with common disbursing transactions . . . . . E-4 E-4
- .02 File obligation documents and maintain obligation files . . . . . E-4 -
- .40 Prepare and maintain ship's records required to account for supplies and equipage funds . . . . . E-5 -
- .41 Prepare and maintain ship's allotment records . . . . . E-5 -

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SK DK

B. APPROPRIATIONS, ALLOTMENTS, ACCOUNTS, AND FUNDS - Continued

1.00 Practical Factors - Continued

- .60 Utilize, according to their function, appropriations and funds charged or credited in less common transactions . . . . . E-6 -
- .61 Implement, supervise, and maintain departmental budgets . . . . . E-6 -
  
- 2.00 Examination Factors
- .01 Title and symbols of frequently used appropriations and funds . . . E-4 E-4
- .02 Types of appropriations and funds and differences between uses and purposes of each . . . . . E-4 E-4
- .03 Symbol numbers of frequently used stores accounts . . . . . E-4 E-4
- .04 Sources of Coast Guard appropriations and their relationship to supply accounting and reporting . . . . . E-4 -
- .40 Regulations pertaining to ships' sub-allotments . . . . . E-5 -
- .60 Regulations pertaining to appropriations, allotments, and departmental budgets . . . . . E-6 -

C. MATERIAL IDENTIFICATION AND PROCUREMENT

1.00 Practical Factors

- .01 Maintain requisition logs and files . . . . . E-4 -
- .02 Prepare appropriate documents to procure general stores, retail clothing, subsistence items, equipage, and repair parts . . . . . E-4 -
- .03 Identify symbols and markings used on bar metal, gas cylinders, fuel drums, and acid carboys . . . . . E-4 -
- .04 Identify and classify general stores, retail clothing, subsistence items, equipage, and repair parts . . . . . E-4 -
- .05 Determine and apply appropriate material requirements priority numbers . . . . . E-4 -
- .40 Determine routine requirements for general stores, retail clothing, subsistence items, equipage, and repair parts . . . . . E-5 -
- .41 Use allowance lists in determining requirements and in procurement . . . . . E-5 -
- .42 Procure, from approved sources using approved methods, required general stores, technical stores, retail clothing, commissary store stock, and subsistence items . . . . . E-5 -
- .60 Check and approve routine stock requirements submitted prior to final preparation of requisitions; and check and approve prepared stock requisitions prior to their formal submission . . . . . E-6 -

2.00 Examination Factors

- .01 Systems of symbols and markings used on such materials as bar metal, gas cylinders, fuel drums, and acid . . . . . E-4 -
- .02 Nomenclature, classifications, units of measure, and units of issue of general stores, retail clothing, subsistence items, equipage, and repair parts . . . . . E-4 -
- .40 Methods of determining requirements for, and sources of procurement of, general stores, retail clothing, subsistence items, equipage and repair parts . . . . . E-5 -

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SK DK

D. RECEIPTS, CUSTODY, AND STOWAGE

1.00 Practical Factors

- .01 Receive, verify for quantity and condition, and acknowledge receipt of general stores, retail clothing, subsistence items, equipage and repair parts . . . . . E-4 -
- .02 Prepare receipt papers for final accomplishment . . . . . E-4 -
- .03 Observe safety regulations in stowing and caring for general stores, retail clothing, subsistence items, equipage and repair parts . . . . . E-4 -
- .04 Use, under simulated conditions, various types of firefighting equipment provided for extinguishing fires in holds, storerooms, and warehouses . . . . . E-4 -
- .05 Use dunnage and cargo pallets aboard ship and in warehouses . . . . . E-4 -
- .06 Operate mechanized materials-handling equipment . . . . . E-4 -
- .40 Make space allocations and layouts with respect to physical characteristics of stores, rate of turnover, points of issue, use of stores, climatic conditions, and other special conditions concerned with storage of materials . . . . . E-5 -
- .41 Stow special items, such as alcohol, acid, bar and sheet steel, lumber, and paints . . . . . E-5 -
- .42 Determine disposition of incoming stock . . . . . E-5 -
- .43 Prepare for the receipt of material; direct working parties in dock, lighter, or tender pickups; and supervise working parties handling stores . . . . . E-5 -
- .60 Prepare stowage plans considering space and weight limitations . . . . . E-6 -
- .61 Demonstrate the methods of handling, reporting, and accounting for damaged or short shipments and deliveries . . . . . E-6 -
- .62 Prepare substantiating vouchers required in reports and returns of unusual receipts such as receipts from other government branches or foreign governments, and material purchased in a foreign port . . . . . E-6 -

2.00 Examination Factors

- .01 Factors to be considered in stowing materials . . . . . E-4 -
- .02 Functions and safety precautions of the various types of materials-handling equipment used in supply work . . . . . E-4 -
- .03 Safety regulations pertaining to the stowage and care of general stores, retail clothing, ship's store stock, subsistence items, and technical stores; precautions to be taken when stowing materials to allow access to damage-control and firefighting equipment and fittings; and danger of spontaneous combustion and precautions to be taken for its prevention . . . . . E-4 -
- .04 Regulations pertaining to responsibility and accountability for stock placed in storekeeper's custody . . . . . E-4 -
- .39 Methods of receiving, inspecting, and stowing materials:
  - a. Not requiring special handling . . . . . E-4 -
  - b. Requiring special handling . . . . . E-5 -

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SK DK

D. RECEIPTS, CUSTODY, AND STOWAGE - Continued

2.00 Examination Factors - Continued

- .60 Advantages and disadvantages of various types of stowage plans used by the Coast Guard . . . . . E-6 -
- .61 Regulations pertaining to the receipt of stores under unusual circumstances, such as from foreign governments, other U. S. Government agencies, merchant ships; material and services purchased in a foreign port; and gifts from civilians . . . . . E-6 -

E. EXPENDITURES AND SHIPMENTS

1.00 Practical Factors

- .01 Issue, in accordance with current regulations, items of general stores, retail clothing, subsistence items, equipage and repair parts which are in the custody of the supply officer . . . . . E-4 -
- .02 Prepare expenditure documents for final accomplishment . . . . . E-4 -
- .03 Package and crate items in preparation for shipping and mark for purposes of identification according to current regulations . . . . . E-4 -
- .40 Receive, store, and assemble cargo for shipment . . . . . E-5 -
- .41 Process shipments of personal effects and household goods in accordance with current regulations . . . . . E-5 -
- .42 Transfer or recommend for survey, in accordance with current regulations, items of general stores, retail clothing, subsistence items, equipage, and repair parts . . . . . E-5 -
- .60 Prepare substantiating vouchers required in reports and returns of unusual expenditures, such as receipts from other government branches or foreign governments, and material purchased in a foreign port . . . . . E-6 -

2.00 Examination Factors

- .01 Regulations pertaining to marking crates and packages prior to shipping . . . . . E-4 -
- .02 Regulations pertaining to issues of general stores, clothing and small stores, provisions and equipage repair parts which are in custody of the supply officer . . . . . E-4 -
- .40 Regulations pertaining to issues of general stores and technical stores not in custody of the supply officer . . . . . E-5 -
- .41 Purposes and functions of ocean manifests and bills of lading, and related forms . . . . . E-5 -
- .42 Regulations pertaining to transfer and survey of material . . . . . E-5 -
- .60 Computation of the cube of cargo to be loaded and/or shipped and comparison with cube and space available . . . . . E-6 -
- .61 Regulations pertaining to the expenditure of stores under unusual circumstances, such as to foreign governments, other U.S. Government agencies, merchant ships, and sales to civilians . . . . . E-6 -



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SK DK

F. STOCK RECORDS AND INVENTORY CONTROL

1.00 Practical Factors

- .01 Account locally for receipts and expenditures of general stores, retail clothing, ship's store stock, subsistence items, equipage and repair parts . . . . . E-4 -
- .02 Assist in taking inventory by counting and reporting count . . . . . E-4 -
- .03 Assist in preparation of appropriate returns afloat . . . . . E-4 -
- .40 Make entries in stock records to adjust them in accordance with inventories; post stock records with entries that reflect unusual transactions, such as nonreceipt of invoiced material; and maintain controlled equipage records and inventories . . . . . E-5 -
- .60 Prepare required reports and returns for general stores, clothing, and small stores, provisions, electronic equipment, ships' machinery and repair parts, special materials and services . . . . . E-6 -
- .61 Organize and assist in the supervision of inventory teams for retail clothing, subsistence items, repair parts, and general stores . . . . . E-6 -
- .80 Prepare replenishment data for all stores under cognizance of the supply department, estimating requirements which would exist on cruises of various lengths and under various climatic conditions . . . . . E-7 -

2.00 Examination Factors

- .01 Current procedures pertaining to preparing and maintaining stock records . . . . . E-4 -
- .02 Purposes and functions of the various stock records . . . . . E-4 -
- .03 Regulations pertaining to procedures, other than preparation of returns, used in accounting for general stores, retail clothing, subsistence items, equipage and repair parts . . . . . E-4 -
- .40 Vouchers required to substantiate the expenditure of stores under cognizance of the supply department . . . . . E-5 -
- .41 Essential differences in accounting procedures for ships with or without supply officers attached . . . . . E-5 -
- .60 Preparation of stock records and substantiating vouchers covering uncommon types of issues, transfers and sales, such as to other governments, to other U. S. Government agencies, and to vessels in distress . . . . . E-6 -
- .80 Information sources and methods of determining requirements for cruises of various lengths and under various climatic conditions for all stores . . . . . E-7 -
- .81 Instructions for and preparation of required reports and returns for special materials and services . . . . . E-7 -

G. PAY AND ALLOWANCES

1.00 Practical Factors

- .01 Assist disbursing officer or agent cashier in conducting payday. . . . . E-4 E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SK DK

G. PAY AND ALLOWANCES - Continued

1.00 Practical Factors - Continued

- .02 Compute Coast Guard pay and withholding of income and Federal Insurance Contributions Act (FICA) taxes, and prepare money lists and payroll certification sheets . . . . . E-4 E-4
- .03 Verify pay receipts and issued checks against completed money lists and pay records . . . . . E-4 E-4
- .04 Compute pay entry base dates and longevity . . . . . E-4 E-4
- .40 Inform Coast Guard personnel of their entitlement to various types of pay and allowances . . . . . E-5 E-5

2.00 Examination Factors

- .01 Regulations governing quarters, subsistence, leave rations, clothing and uniforms, withholding of income and FICA taxes, and payment of Coast Guard personnel . . . . . E-4 E-4
- .02 Method of computing and liquidating advances of pay . . . . . E-4 E-4
- .03 Pay and allowances upon enlistment, discharge, reenlistment, and extension . . . . . E-4 E-4
- .04 Regulations governing incentive and special duty pay as well as those governing pay losses due to unauthorized absence, sickness due to own misconduct, and court-martial orders . . . . . E-4 E-4
- .05 Rates, ratings, and their abbreviations; paygrades of enlisted personnel; grades, abbreviations, and paygrades of officer personnel . . . . . E-4 E-4
- .40 Regulations governing personal money allowances for officers of flag rank . . . . . E-5 E-5
- .60 Regulations governing payments for pay purposes to personnel of the Army, Air Force, Marine Corps, and Navy . . . . . E-6 -

H. MILITARY PAY RECORDS

1.00 Practical Factors

- .39 Open, maintain, and close the following military pay records:
  - a. Regular . . . . . E-4 E-4
  - b. Temporary, drill, and training . . . . . E-5 E-5
  - c. Active and inactive duty training . . . . . E-5 E-5
- .60 Perform complicated entries on the military pay records . . . . . E-6 -
- .61 Audit military pay records . . . . . E-6 -

2.00 Examination Factors

- .01 Preparation and submission of pay record vouchers . . . . . E-4 E-4
- .02 Content and use of officer and enlisted personnel records as they pertain to disbursing . . . . . E-4 E-4
- .03 Utilization of the enlisted personnel diary system to effect adjustments to the enlisted military pay record . . . . . E-4 E-4
- .04 Regulations governing use of blocks, items, and lines . . . . . E-4 E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SK DK

H. MILITARY PAY RECORDS - Continued

2.00 Examination Factors - Continued

.05	Regulations governing security of pay records; special provisions for Pay Record Access (PRA) pay records . . . . .	E-4	E-4
.40	Disposition of pay records of personnel missing, retired, deceased, discharged or released from active duty . . . . .	E-5	E-5
.41	Regulations governing methods of preparing various vouchers that substantiate changes to the military pay record . . . . .	E-5	E-5
.60	Regulations governing unusual credit and checkage entries on the military pay record . . . . .	E-6	-

I. ALLOTMENTS

1.00 Practical Factors

.01	Register and stop allotments of pay . . . . .	E-4	E-4
.40	Advise Coast Guard personnel of the types and uses of allotments and methods of obtaining each . . . . .	E-5	E-5

2.00 Examination Factors

.01	Purposes for which allotments are authorized and their abbreviated designations . . . . .	E-4	E-4
.02	Restrictions on allotments including those regarding number that may be registered, amount that may be allotted and eligible allottees . . . . .	E-4	E-4
.03	Action to be taken with regard to allotments for members who are deserters, absentees, prisoners of war, deceased or missing . . . . .	E-4	E-4

J. TRANSPORTATION AND TRAVEL

1.00 Practical Factors

.01	Utilize mileage tables and travel guides . . . . .	E-4	E-4
.02	Prepare transportation requests and meal tickets . . . . .	E-4	E-4
.40	Compute travel allowances . . . . .	E-5	E-5

2.00 Examination Factors

.40	Regulations governing travel of members of the Armed Forces and their dependents . . . . .	E-5	E-5
.41	Regulations governing computation and payment of dislocation and trailer allowances, and transportation of household effects . . . . .	E-5	E-5
.60	Regulations governing travel under special circumstances . . . . .	E-6	-

K. PUBLIC VOUCHERS

1.00 Practical Factors

.01	Prepare public vouchers from memorandum data . . . . .	E-4	E-4
.40	Compile memorandum data to facilitate preparation of public vouchers . . . . .	E-5	E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SK DK

K. PUBLIC VOUCHERS - Continued

1.00 Practical Factors - Continued

.60	Audit public vouchers prior to submission to disbursing officer for payment . . . . .	E-6	-
2.00 Examination Factors			
.39	Purposes, requirements, and preparation of public vouchers used:		
a.	Frequently . . . . .	E-4	E-4
b.	Infrequently . . . . .	E-6	-
.40	Documents and certificates required to substantiate public vouchers . . . . .	E-5	E-5
.60	Responsibility for preparation and payment of public vouchers . . .	E-6	-
.61	Regulations governing payments of public debts requiring special forms . . . . .	E-6	-

L. REPORTS AND RETURNS

1.00 Practical Factors

.01	Prepare financial returns from memorandum data . . . . .	E-4	E-4
.40	Compile memorandum data to facilitate preparation of financial returns . . . . .	E-5	E-5
.60	Examine and audit returns and claims prior to submission . . . . .	E-6	-

2.00 Examination Factors

.40	Regulations governing preparation and submission of depository account returns, financial returns, and foreign currency reports . .	E-5	E-5
.60	Procedure ashore for submitting returns to, and via, the regional financial office . . . . .	E-6	-
.61	Regulations governing settlement of accounts . . . . .	E-6	-
.62	Regulations governing relief and detachment of disbursing officers .	E-6	-
.80	Special disbursing reports including report of disbursing duty, report of defaulting contractors, undelivered checks, and report of sale of surplus and condemned material . . . . .	E-7	-

★ SENIOR CHIEF STOREKEEPER (SKCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement  
SK

- 1.00 Practical Factors
  - .90 Recommend high and low limits of stock controlled by supply department . . . . . E-8
  - .91 Develop supply department organization bills, orders, instructions, and notices . . . . . E-8
  - .92 Monitor inspection and receipt procedures for incoming supplies. . E-8
  - .93 Disseminate information on safety precautions and monitor compliance . . . . . E-8
  - .94 Supervise the operation of a payroll office, disbursing office or a physically separated group.. . . . E-8
  - .941 Evaluate system of internal controls in effect at local disbursing office, using general directives as a basis for evaluations, and taking into account any procedures which are peculiar to the local operation . . . . . E-8
  
- 2.00 Examination Factors
  - .90 Scope and nature of information contained in service publications pertaining to supply operations . . . . . E-8
  - .91 Systems of accounting for all types of Coast Guard expenditures and allotments as pertain to disbursing functions afloat and ashore. E-8
  - .92 Regulations and procedures governing operation of a Finance Office .E-8
  - .93 Regulations governing duties and responsibilities of agent cashiers . . . . . E-8

★ MASTER CHIEF STOREKEEPER (SKCM)

QUALIFICATIONS FOR ADVANCEMENT

- 1.00 Practical Factors
  - .95 Provide technical information to the command concerning uses, capabilities, and limitations of labor saving devices and equipment used in supply operations . . . . . E-9
  - .96 Assist supply officer in directing procurement, receipt, stowage, issue inventory, accountability, and establishment and maintenance of adequate stock levels of supplies, material, and repair parts to meet operational requirements . . . . . E-9
  - .97 Gather and disseminate information concerning availability of material and facilities required for ship or station operation, maintenance, repair, and training missions . . . . . E-9
  - .98 Direct an inspection/audit of a disbursing office's financial transactions . . . . . E-9
  - .99 Evaluate effectiveness of local pay office procedures in meeting the requirements of the command. Develop plans for implementation of conclusions . . . . . E-9
  - .991 Prepare Supply Department Organization Manual and Instructions Afloat . . . . . E-9
  - .992 Conduct inspections of buildings, spaces, and areas, for conformance to safety and maintenance regulations; formulate guidelines concerning potentially hazardous conditions and practices pertaining to supply work areas and equipment . . . . . E-9

MASTER CHIEF STOREKEEPER (SKCM) - Continued

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement  
SK

1.00 Practical Factors - Continued

- .993 Inspect and report on unit supply procedure and system for effectiveness and economy of operation . . . . . E-9
- .994 Monitor preventive maintenance procedures for supply facilities and equipment . . . . . E-9
- .995 Supervise supply department functions aboard large ships and in shore activities:
  - a. Administration . . . . . E-9
  - b. Control Division . . . . . E-9
  - c. Material . . . . . E-9
  - d. Fiscal . . . . . E-9

2.00 Examination Factors

- .95 Declassification requirements of classified matter . . . . . E-9
- .96 Procedures to prevent loss of Government funds or other accountable materials . . . . . E-9
- .97 Regulations governing cash assets held including military payment certificates and foreign currencies . . . . . E-9
- .98 Regulations governing the use of Treasury checks . . . . . E-9

YEOMAN (YN)

GENERAL RATING

SCOPE

Yeomen perform clerical, administrative, and secretarial duties; prepare, type, route, and file correspondence and reports; maintain service records, publications, and directives, and personnel accounting records; operate duplicating equipment; and serve as reporters for courts-martial and fact-finding bodies. Personnel in higher paygrades act as office managers.

SERVICE RATING (PO3)

SCOPE

COMMUNICATIONS YEOMAN - CYN

Communications Yeomen perform clerical duties in communications stations and/or facilities, including shipboard communications offices; log, route, file, and maintain security of messages in accordance with existing regulations, instructions, and procedures included in pertinent publications; act as registered publications clerk; maintain communications publications; operate and control radiotelephone and radioteletype equipment.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
YN CYN

A. OFFICE AND COMMUNICATIONS PROCEDURES

1.00 Practical Factors

.01	Write or print legibly; spell commonly used words and naval terms. . .	E-4	E-4
.02	Maintain and operate a directory service . . . . .	E-4	-
.03	Maintain ship or station general files in accordance with Coast Guard Standard Subject Classification System; file directives in accordance with Coast Guard Directives System . . . .	E-4	-
.04	Stow, issue, and requisition supplies . . . . .	E-4	E-4
.05	Meet enlisted, officer, and civilian personnel as a receptionist; handle telephone communications . . . . .	E-4	E-4
.06	Speak clearly and distinctly . . . . .	E-4	E-4
.07	Perform routine clerical duties in a communications office . . . . .	-	E-4
.08	Keep communications logs . . . . .	-	E-4
.40	Prepare, interpret, and transcribe messages using standard abbreviations . . . . .	E-5	-
.41	Keep watch, quarter, and station bill up to date and posted . . . .	E-5	-
.60	Organize and supervise maintenance of ship or station general files and filing of directives . . . . .	E-6	-
.78	Take dictation: (See Performance Test Instructions)		
	a. 60 words per minute . . . . .	E-6	-
	b. 80 words per minute . . . . .	E-7	-
.79	Transcribe dictation: (See Performance Test Instructions)		
	a. 6 words per minute . . . . .	E-6	-
	b. 8 words per minute . . . . .	E-7	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
YN CYN

A. OFFICE AND COMMUNICATIONS PROCEDURES - Continued

2.00 Examination Factors

.01	Good English usage, including punctuation, spelling, syllabi- cation, formation of possessives, and Coast Guard abbreviations. . .	E-4	E-4
.02	General content of the Coast Guard Directives System and Coast Guard Standard Subject Classification System . . . . .	E-4	E-4
.03	Uses of and procedures for preparing operating logs . . . . .	-	E-4
.40	Regulations concerning disposal, stowage, and transmission of obsolete files and records . . . . .	E-5	-
.60	Equipment procurement procedures . . . . .	E-6	-
.61	Function of the watch, quarter, and station bill, and its preparation . . . . .	E-6	-
.62	Organization of ship or station general files; both classified and unclassified . . . . .	E-6	-
.80	Office management concepts and techniques (ashore and afloat) . . .	E-7	-

B. EQUIPMENT OPERATION

1.00 Practical Factors

.01	Operate office duplicating machines . . . . .	E-4	E-4
.02	Start, stop, and operate manual and automatic teletypewriter equipment . . . . .	-	E-4
.03	Transmit by teletypewriter: (See Performance Test Instructions) A file containing 600 characters of 3 messages in 9 minutes; at least one of the messages will be composed of 5 character groups, random mixed numerals . . . . .	-	E-4
.39	Typewrite for 5 minutes: (See Performance Test Instructions)		
a.	At 25 words per minute . . . . .	-	E-4
b.	At 30 words per minute . . . . .	E-4	-
c.	At 40 words per minute . . . . .	E-5	-
d.	At 50 words per minute . . . . .	E-6	-

2.00 Examination Factors

.01	Operating principles of various types of teletypewriters . . . . .	-	E-4
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C. SERVICE RECORD MAINTENANCE, PERSONNEL ACCOUNTING, AND RELATED PROCEDURES AND REPORTS

1.00 Practical Factors

.01	Prepare personnel diaries in accordance with the Personnel Accounting Manual (CG-216) . . . . .	E-4	-
.02	Prepare and keep up to date personnel accounting records . . . . .	E-4	-
.03	Carry out procedures for transfer and receipt of personnel . . . . .	E-4	-
.04	Prepare statistical reports including allowance/onboard count, rations, and muster . . . . .	E-4	-
.05	Prepare Armed Forces Identification Cards, liberty passes, and leave authorizations . . . . .	E-4	-



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
YN CYN

C. SERVICE RECORD MAINTENANCE, PERSONNEL ACCOUNTING AND RELATED PROCEDURES AND REPORTS - Continued

1.00 Practical Factors - Continued

.39	Make service record entries pertaining to:		
	a. Emergency data (dependency, next of kin) . . . . .	E-4	-
	b. Training and education . . . . .	E-4	-
	c. Advancement, reduction, and change in rating, rate, or status . . . . .	E-4	-
	d. Decorations, medals, and awards . . . . .	E-4	-
	e. Transfer and receipt . . . . .	E-4	-
	f. Leave . . . . .	E-4	-
	g. Performance (Marks) . . . . .	E-4	-
	h. Government driver qualifications . . . . .	E-5	-
	i. Discipline . . . . .	E-5	-
	j. Enlistment, reenlistment, and extension of enlistment . . . . .	E-5	-
	k. Unauthorized absence, desertion, and deductible time . . . . .	E-5	-
	l. Separation, retirement, and death . . . . .	E-5	-
.40	Verify enlisted service records . . . . .	E-5	-
.41	Prepare Applications for Uniformed Services Identification and Privilege Cards (DD Form 1172) . . . . .	E-5	-
.60	Verify personnel accounting system reports and records in accordance with the Personnel Accounting Manual (CG-216) . . . . .	E-6	-
.61	Prepare letters and reports required in officer personnel administration . . . . .	E-6	-

2.00 Examination Factors

.01	Purpose, general plan, and instructions regarding the Coast Guard Personnel Accounting System . . . . .	E-4	-
.02	Coast Guard commissioned officer and warrant officer grades; enlisted ratings and rates, designators, and special skill indicators . . . . .	E-4	-
.39	Regulations concerning:		
	a. Transfer - permanent change of station, temporary duty, and temporary additional duty . . . . .	E-4	-
	b. Receipt and takeup procedures . . . . .	E-4	-
	c. Leave, liberty, and compensatory absence . . . . .	E-4	-
	d. Advancement, change or reduction in rate, rating, or status . . . . .	E-4	-
	e. Preparation and use of personnel and disbursing forms . . . . .	E-4	-
	f. Armed Forces Identification Cards . . . . .	E-4	-
	g. Pay and allowances . . . . .	E-4	-
	h. Travel and proceed time . . . . .	E-4	-
	i. Decorations, medals, and awards . . . . .	E-4	-
	j. Methods of computing:		
	(1) Basic pay . . . . .	E-4	-
	(2) Deductible time . . . . .	E-4	-
	(3) Retirement . . . . .	E-5	-
	k. Separation and retirement . . . . .	E-5	-
	l. Enlistment, extension of enlistment, and reenlistment . . . . .	E-5	-
	m. Appointment and promotion of regular and reserve commissioned officers and warrant officers . . . . .	E-5	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
YN CYN

C. SERVICE RECORD MAINTENANCE, PERSONNEL ACCOUNTING AND RELATED PROCEDURES AND REPORTS - Continued

2.00 Examination Factors - Continued

n. Security clearances . . . . .	E-5	-
o. Rotation . . . . .	E-5	-
p. Uniformed Services Identification and Priviledge Cards . . . . .	E-5	-
q. Quarters and subsistence . . . . .	E-5	-
r. Distribution and assignment of enlisted personnel; qualification codes . . . . .	E-6	-
s. Casualty reporting and assistance . . . . .	E-6	-
t. Retired Serviceman Family Protection Plan . . . . .	E-6	-
u. Officer Fitness Reports . . . . .	E-6	-
v. Officer career patterns . . . . .	E-7	-

D. REPORTS, PUBLICATIONS, AND SECURITY

1.00 Practical Factors

.01 Maintain current publications . . . . .	E-4	E-4
.02 Prepare reports of recorded test data and work accomplished from supplied information, using work logs, equipment histories, and check-off lists as required by the Coast Guard Electronics Maintenance Manual (CG-165) . . . . .	-	E-4
.03 Inventory, record, and report tools and portable test equipment assigned for the maintenance and repair of communications equipment . . . . .	-	E-4
.04 Prepare and complete entries in communications equipment failure reports from supplied information . . . . .	-	E-4
.05 Prepare forms for job orders and work requests . . . . .	-	E-4
.06 Assist in obtaining part and stock numbers from the technical and supply publications for tools and replacement parts using standard procedures for requisitioning and for survey of such materials . . . . .	-	E-4
.07 Observe regulations governing communications procedures and use of Coast Guard, Navy, Joint, and Allied publications in the handling of messages . . . . .	-	E-4
.08 Use call-sign cipher devices for encoding and decoding message headings . . . . .	-	E-4
.09 Authenticate on radiotelephone and/or radioteletypewriter circuits . . . . .	-	E-4
.10 Prepare administrative and operational records and reports . . . . .	E-4	-
.40 Establish and maintain reports control system (RPS) . . . . .	E-5	-
.60 Direct personnel in making corrections to publications; exercise control over procurement, stowage, issuance, and custody of publications . . . . .	E-6	-

2.00 Examination Factors

.01 General content and use of standard publications pertaining to personnel and general administration, including the following: a. U.S. Coast Guard Regulations, Personnel Manual, Directives System, Correspondence Manual; and Department of the Navy Security Manual for Classified Information, as amended for Coast Guard use . . . . .	E-4	E-4
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QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
YN CYN

D. REPORTS, PUBLICATIONS, AND SECURITY - Continued

2.00 Examination Factors - Continued

b.	Manual for Courts-Martial and Coast Guard Supplement to the Manual for Courts-Martial . . . . .	E-4	-
.02	Mission, policies, and fundamental considerations of naval communications, as outlined in CG-233 and DNC-5 . . . . .	-	E-4
.03	Purpose of electronic reports required by USCG Electronics Maintenance Manual (CG-165) . . . . .	-	E-4
.04	Authority for methods of promulgation of, and entry of various types of corrections to, communications publications . . . . .	-	E-4
.05	Principles of, and requirements for, communications security, as prescribed in security publications . . . . .	-	E-4
.06	Stowage requirements and other safeguards for registered and other classified matter . . . . .	E-4	E-4
.07	Destruction bills for registered and nonregistered publications and procedures for effecting destruction . . . . .	-	E-4
.08	System of assigning "AN" letter-number combinations as designation for electronic equipment . . . . .	-	E-4
.40	Source and methods of procuring publications and changes . . . . .	E-5	-
.41	Regulations governing classification and preparation of classified matter . . . . .	E-5	-
.42	Purpose and use of the reports control system (RPS) . . . . .	E-5	-

E. CORRESPONDENCE

1.00 Practical Factors

.01	Prepare correspondence in accordance with Coast Guard Correspondence Manual . . . . .	E-4	E-4
.40	Prepare, route, and forward correspondence in accordance with Coast Guard Correspondence Manual and local instructions . . . . .	E-5	-
.60	Compose correspondence and directives on own initiative or from oral or written outline . . . . .	E-6	-
.61	Compose and prepare social correspondence . . . . .	E-6	-

2.00 Examination Factors

.01	General instructions and procedures for the preparation of correspondence . . . . .	E-4	E-4
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F. LEGAL PROCEDURES

1.00 Practical Factors

.01	Act as mast yeoman; furnish commanding officer with service record and resume of previous offenses; notify accused, master-at-arms, witnesses, and division officers of date and time of mast; keep unit punishment book, record of offenses and dispositions in service record, and furnish information for inclusion in ship's log and diary . . . . .	E-4	-
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QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
YN CYN

F. LEGAL PROCEDURES - Continued

1.00 Practical Factors - Continued

- .02 Type and distribute appointing orders, charge sheets, and miscellaneous orders for summary court-martial; complete proceedings and assemble records . . . . . E-4 -
- .40 Type and distribute appointing orders, charge sheets, and miscellaneous orders for special and general courts-martial . . . . E-5 -
- .60 Type preliminary papers, act as reporter, complete proceedings, and assemble records for factfinding bodies . . . . . E-6 -
- .61 Record testimony in special or general court -martial; assemble records and complete proceedings . . . . . E-6

2.00 Examination Factors

- .39 Nonjudicial punishment and types of courts-martial, punishment each can award, pretrial and court procedures, and disposition of records and proceedings:
  - a. Nonjudicial punishment . . . . . E-4 -
  - b. Summary . . . . . E-4 -
  - c. Special . . . . . E-5 -
  - d. General . . . . . E-6 -
- .60 Purposes, organizations, and procedures of investigation and courts of inquiry . . . . . E-6 -
- .61 Instructions relating to discipline and the preparation of papers, including charges and specifications, required in proceedings of Coast Guard courts-martial and factfinding bodies . . . . . E-6

G. TRAFFIC HANDLING

1.00 Practical Factors

- .01 Prepare in naval form: plaindress, abbreviated plaindress, and codress messages for transmission . . . . . - E-4
- .02 Perform communications procedures prescribed for transmission of naval messages, including use of call signs, address troupes, address indicating groups, prosigns, routing indicators, prowords, and operating signals . . . . . - E-4
- .03 Start and stop radiotelephone equipment; transmit and receive on radiotelephone circuits, using standard procedures and keeping logs. - E-4
- .04 Stand watch on teletypewriter circuit; keeping logs . . . . . - E-4

2.00 Examination Factors

- .01 Construction of naval messages; forms, types and classes . . . . . - E-4
- .02 Precedence and classification in traffic-handling . . . . . - E-4
- .03 Regulations governing circuit discipline on radiotelephone and teletypewriter circuits . . . . . - E-4
- .04 Regulations for sending messages involving tolls . . . . . - E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
YN CYN

H. OPERATIONAL MAINTENANCE

1.00 Practical Factors

- .01 Assist technician in locating information from technical and maintenance publications necessary for the maintenance and repair of teletypewriter equipment; enter corrections to publications when changes are made . . . . . - E-4
- .02 Inspect, clean, and lubricate teletypewriters; change ribbon, paper, and tape . . . . . - E-4
- .03 Clean, oil, and set external operating controls on office duplicating machines and typewriters . . . . . E-4 E-4

2.00 Examination Factors

- .01 Types of information contained in electronic technical and maintenance publications . . . . . - E-4

I. SAFETY

1.00 Practical Factors

- .01 Demonstrate under simulated conditions the rescue of a person in contact with an energized electrical circuit, resuscitation of a person unconscious from electrical shock, and treatment for electrical and acid burns . . . . . - E-4
- .02 Demonstrate use of firefighting equipment for electrical/electronic equipment fires . . . . . - E-4

2.00 Examination Factors

None.

J. ORGANIZATION AND ADMINISTRATION

1.00 Practical Factors

- .80 Coordinate preparation and maintenance of ship's organization book, including bills and ship's permanent directives . . . . . E-7 -
- .81 Organize and supervise office workflow; serve as office manager . . . . . E-7 -
- .82 Perform duties of ship's secretary . . . . . E-7 -
- .83 Review administrative reports and outgoing correspondence for accuracy and adequacy . . . . . E-7 -
- .84 Supervise procurement, storage, accounting, preservation, and allocation of office materials and equipment . . . . . E-7 -

2.00 Examination Factors

- .01 Location of Coast Guard district offices and general location of Coast Guard districts . . . . . E-4 E-4
- .02 Standard shipboard communications organization . . . . . - E-4
- .03 Organization of the Coast Guard communications system . . . . . - E-4
- .40 Internal organization and functions of ships and stations . . . . . E-5 -
- .41 Chain of command . . . . . E-5 -

QUALIFICATIONS FOR ADVANCEMENT

J. ORGANIZATION AND ADMINISTRATION - Continued

Required for  
Advancement to  
YN CYN

2.00 Examination Factors - Continued

- .60 Content and purpose of Coast Guard regulations and directives . . . E-6 -
- .61 General organization of the Coast Guard and functions of  
each component . . . . . E-6 -

K. TRAINING AND EDUCATION, PERSONAL AFFAIRS, MORALE AND BENEFITS

1.00 Practical Factors

- .40 Counsel personnel regarding rights and benefits . . . . . E-5 -
- .41 Advise personnel of procuring training, educational and  
informational publications and aids . . . . . E-5 -

2.00 Examination Factors

- .40 Official publications and directives on rights, benefits, and  
services available to active and retired Coast Guard personnel  
and their dependents . . . . . E-5 -
- .41 Programs leading to higher education, advanced training, and/or  
commissioned rank . . . . . E-5 -
- .42 Service school eligibility, training courses and other sources  
of educational material, including USAFI . . . . . E-5 -
- .59 Coast Guard policy regarding:
  - a. Morale services . . . . . E-5 -
  - b. Agencies indirectly associated with morale services . . . . . E-6 -
- .60 Regulations concerning education and examination program for  
commissioned officers . . . . . E-6 -

★ SENIOR CHIEF YEOMAN (YNCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
YN

1.00 Practical Factors

- .90 Coordinate records disposal program . . . . . E-8
- .91 Administer training programs for clerical personnel . . . . . E-8

2.00 Examination Factors

- .90 Regulations and procedures for classification, security, accountability, dissemination, transmission, and disposition of classified and registered matter . . . . . E-8
- .91 Objectives and operation of Coast Guard record management program, including directives system, forms control, Standard Subject Classification System, and records disposal procedures . . . . . E-8

★ MASTER CHIEF YEOMAN (YNCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Provide information to the command on regulations, procedures and practices applicable to the personnel and general administrative fields . . . . . E-9
- .96 Express ideas or facts clearly and forcefully, either orally or in writing; develop administrative or executive department directives, instructions, regulations, and other written media for use in personnel administration . . . . . E-9
- .97 Analyze organization methods; recommend modification of organization in accordance with workload . . . . . E-9
- .98 Assist in developing budget estimates . . . . . E-9
- .99 Serve as assistant to personnel officer . . . . . E-9

2.00 Examination Factors

None.



AC



AE



AT



AD



AO



AK



AM



PR

# AVIATION GROUP V

Air Controlman	AC
Aviation Electrician's Mate	AE
Aviation Electronics Technician	AT
Aviation Machinist's Mate	AD
Aviation Ordnanceman	AO
Aviation Storekeeper	AK
Aviation Structural Mechanic	AM
Parachute Rigger	PR
<i>Aviation Survivalman</i>	ASM #3



AIR CONTROLMAN (AC)

EMERGENCY RATING

SCOPE

Air Controlmen perform duties involved in the control of aircraft traffic at airdromes, seadromes, and on board ship by means of radio, radar, flashing light signals, and flag hoists; are familiar with the purpose, use, and principles of air traffic control radars and surveillance and precision approach equipment; know operating procedures of control towers, operations offices, and approach control.

NOTE: All Air Controlmen (AC) must meet the physical requirements set forth in the USCG Medical Manual and Commandants Instruction 1306.3 series, including the following:

- (1) Personnel entering the Air Controlman rating must have a minimum of 20/50 vision in either eye corrected to 20/20.
- (2) Air Controlmen who have a minimum of 20/100 vision may remain in the AC rating, provided the visual acuity is corrected to 20/20 and the correction is worn while in the performance of duties.
- (3) Air Controlmen who are applicants for FAA certification must, under FAA regulations, have a minimum of 20/50 vision corrected to 20/20.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AC

A. SAFETY

1.00 Practical Factors

- .01 Observe safety precautions in handling, adjusting, and operating electrical and electronic equipment. . . . . E-4
- .80 Inspect work areas, tools, equipment, and facilities to detect potentially hazardous and unsafe conditions and take corrective action . E-7
- .81 Interpret directives and instructions on safety precautions to identify those applicable to air control facilities and equipment; establish safeguards, procedures, and standards to ensure compliance by personnel supervised . . . . . E-7
- .82 Organize and administer a program of safety instruction applicable to air control facilities . . . . . E-7

2.00 Examination Factors

None.

B. CONTROL TOWER OPERATIONS

1.00 Practical Factors

- .01 Possess a Federal Aviation Agency Control-Tower Operator Certificate-Junior . . . . . E-4
- .02 Operate and select frequencies of radiotelephones to communicate with aircraft . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AC

B. CONTROL TOWER OPERATIONS - Continued

1.00 Practical Factors - Continued

- .03 Control air Traffic under VFR conditions . . . . . E-4
- .04 Issue instructions to aircraft on the ground relative to taxiing, parking, ordnance disposal, refueling, and related airport information. . . . . E-4
- .05 Issue oral instructions from the control tower to dispatch fire, crash, and rescue equipment for emergency landings, crashings, and accidents . . . . . E-4
- .06 Operate interphone communications equipment and voice recorders . . . . . E-4
- .07 Copy instrument flight rules (IFR) clearances and relay to aircraft. . . . . E-4
- .08 Operate airport traffic control signal light gun . . . . . E-4
- .09 Operate field and approach lighting systems and rotating beacons . . . . . E-4
- .10 Obtain a chronometer tick and keep a chronometer record book . . . . . E-4
- .40 Perform operational maintenance of control tower equipment . . . . . E-5
- .60 Supervise procedures used by control tower personnel . . . . . E-6
- .80 Conduct emergency drills for tower personnel . . . . . E-7

2.00 Examination Factors

- .01 Types of information included in landing, taxi, and take off instructions E-4
- .02 Standard marking and lighting systems for identifying sealanes, runways, over-runs, and taxi-ways. . . . . E-4
- .03 Radiotelephone procedures and phraseology used to communicate with aircraft from the control tower. . . . . E-4
- .04 Standard visual signals used by aircraft and control towers. . . . . E-4
- .05 Security measures and regulations pertaining to aircraft communications and operations . . . . . E-4
- .06 Types and general flight characteristics of current U. S. military aircraft; model designation systems used for U. S. aircraft. . . . . E-4
- .07 Characteristics and capabilities of control tower equipment. . . . . E-4
- .08 Federal air regulations pertaining to air traffic control by naval control towers . . . . . E-4
- .09 Principles and procedures pertaining to emergency landings, crashes, and accidents as set forth in OpNav and local instructions . . . . . E-4
- .10 National standard procedures for alerting search and rescue facilities . E-4

C. RADAR AIR TRAFFIC CONTROL

1.00 Practical Factors

- .01 Operate surveillance and height-finding radar and IFF equipment. . . . . E-4
- .02 Operate direction finding equipment. . . . . E-4
- .03 Calibrate and operate remote radar indicators. . . . . E-4
- .40 Control air traffic under IFR conditions . . . . . E-5
- .60 Supervise and monitor operation of radar air traffic control equipment . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AC

C. RADAR AIR TRAFFIC CONTROL - Continued

2.00 Examination Factors

- .01 Purpose and interrelationships of operator positions and equipment in radar air traffic control centers . . . . . E-4
- .02 Types and characteristics of electronic aids to air navigation . . . . . E-4
- .03 Procedures for locating identifying, and tracking aircraft by using radar, direction finding IFF, and related equipment. . . . . E-4
- .04 Effects of weather and topography on the operating capabilities of radar, direction finding, IFF, and related equipment. . . . . E-4
- .05 Characteristics, purposes, phraseology, and general operating procedures of landing approach systems, including Ground Controlled Approach (GCA), Carrier Controlled Approach (CCA), Instrument Landing Systems (ILS), Optical Landing Systems (OLS), and Air Surveillance Radar (ASR). . . . . E-4
- .06 Fundamentals of air navigation . . . . . E-4
- .07 System of nomenclature employed to identify electronic equipment used in air traffic control. . . . . E-4
- .40 Procedures of enroute air traffic control. . . . . E-5
- .41 Instrument flight procedures . . . . . E-5
- .60 General procedures and organization of search and rescue operations. . . E-6
- .80 Purpose and operation of approach control facilities . . . . . E-7

D. FLIGHT PLANNING AND CLEARANCE

1.00 Practical Factors

- .01 Process flight plans . . . . . E-4
- .02 Decode NOTAMS. . . . . E-4
- .03 Prepare, assemble, and maintain flight packets and brief pilots on their contents . . . . . E-4
- .04 Maintain flight data and status boards . . . . . E-4
- .40 Maintain air operations office logs and records. . . . . E-5
- .60 Draft air traffic control messages for teletype dissemination. . . . . E-6
- .61 Encode NOTAMS and prepare for release. . . . . E-6
- .80 Assist pilots in preparing flight plans and associated flight preparation materials and forms. . . . . E-7

2.00 Examination Factors

- .01 General content and use of instructions and publications pertaining to VFR and IFR flight planning and clearances . . . . . E-4
- .02 Symbols, courses, coordinates, distances, topography, and variation found in aeronautical charts . . . . . E-4
- .03 Types and purposes of NOTAMS . . . . . E-4
- .04 Air traffic clearance symbols and abbreviations. . . . . E-4
- .05 Standard aeronautical charts and publications used in air navigation . . E-4
- .06 Procedures for computing estimated time of arrival for aircraft. . . . . E-4
- .40 Types and purposes of flight assistance services . . . . . E-5
- .60 Procedures for and conditions indicating temporary suspension of operations and reopening field to traffic. . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AC

E. WEATHER

1.00 Practical Factors

- .01 Obtain altimeter settings and relay to aircraft . . . . . E-4
- .02 Recognize minimum flying conditions . . . . . E-4
- .03 Interpret weather teletype sequences. . . . . E-4

2.00 Examination Factors

- .01 Types of weather changes which should be reported to local weather facilities. . . . . E-4
- .02 Basic characteristics of weather elements and their significance to air traffic control. . . . . E-4

F. ADMINISTRATION

1.00 Practical Factors

- .60 Use applicable allowance lists, parts catalogs, and forms in the requisitioning, inventorying, and accounting for air traffic control equipment, tools, and materials . . . . . E-6
- .80 Supervise the use, filing, and maintaining of publications, logs, and records . . . . . E-7
- .81 Supervise, establish required inspection procedures, and maintain quality control of individual performance in air traffic control facilities. . . . . E-7

2.00 Examination Factors

- .60 Types of logs, files, publications, and reports required at air traffic control facilities. . . . . E-6
- .61 Instructions contained in publications pertaining to air traffic control procedures and air operations . . . . . E-6
- .62 Responsibilities and authority of the FAA relative to U. S. Naval and U. S. Coast Guard air traffic control operations. . . . . E-6
- .80 U. S. Coast Guard and FAA regulations governing the operation of air traffic control facilities . . . . . E-7

AVIATION ELECTRICIAN'S MATE (AE)

GENERAL RATING

SCOPE

Aviation Electrician's Mates inspect and maintain aircraft electrical and instrument systems, including: power generation, conversion, and distribution systems; interior and exterior lighting; electrical components of aircraft controls, including airframe, engine, propeller, and utility control systems; aircraft electrical starting systems, including starters, starting controls and ignition system components, aircraft engine, flight, and navigation instruments, instrument systems, and non-instrument-type indicating and warning systems; aircraft automatic flight control systems, including automatic pilots, automatic flight stabilization systems, aircraft compasses, and attitude reference systems; aircraft batteries; and related electrical components; and test and adjust auxiliary electrical power units and test equipment; and supervise operation of aviation electrical shops.

NOTE - Practical Factors for the Aviation Electrician's Mate rating are applicable to the aircraft and equipment assigned or available.

SERVICE RATINGS

NONE

QUALIFICATIONS FOR ADVANCEMENT

Required for Advancement to AE

A. SAFETY

1.00 Practical Factors

- .01 Observe safety precautions in:
  - a. Making adjustments and measurements on energized electrical equipment . . . . . E-4
  - b. The handling, servicing, and line maintenance of aircraft and the use of related tools, equipment and material . . . . . E-4
  - c. The stowing, handling and mixing of electrolyte and the servicing and recharging of batteries . . . . . E-4
- .80 Interpret directives and instructions on safety precautions to identify those applicable to aviation electrical work areas and equipment; establish safeguards, procedures and standards to insure compliance by personnel supervised . . . . . E-7
- .81 Inspect work areas, tools and equipment to detect potentially hazardous and unsafe conditions and take appropriate corrective action . . . . . E-7
- .82 Organize and administer a program of safety instruction applicable to aviation electrical equipment and facilities . . . . . E-7

2.00 Examination Factors

- .01 Safety precautions to be observed when working on the line and in the hangar or shop and while in flight (except those applicable exclusively to the control of an aircraft) . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AE

A. SAFETY - Continued

2.00 Examination Factors - Continued

- .02 Safety precautions applicable to aviation personnel to be observed in handling fuels, compressed gases and aircraft batteries . . . . . E-4
- .03 Emergency procedures and the use of standard aviation survival equipment under emergency conditions . . . . . E-4

B. AIRCRAFT ELECTRICAL INSPECTION AND LINE MAINTENANCE

1.00 Practical Factors

- .01 Perform daily and preflight inspections of aircraft electrical equipment for security of mounting and evidence of damage . . . . . E-4
- .02 Check shock mountings for condition of rubber and security of attachments . . . . . E-4
- .03 Check electrical bonding for contact and condition . . . . . E-4
- .04 Replace and adjust limit switches used in aircraft electrical systems . . . . . E-4
- .05 Service and operate ground power units (Note: The driving of self-propelled power units is a local responsibility and not a qualification for advancement.) . . . . . E-4
- .40 Perform operational tests of aircraft electrical systems; verify discrepancies . . . . . E-5
- .41 Perform intermediate and major aircraft inspections . . . . . E-5
- .42 Perform electrical checks on ground power units . . . . . E-5
- .60 Supervise and direct aircraft electrical inspections and line maintenance . . . . . E-6
- .61 Direct the installation of electrical portions of aircraft service changes. . . . . E-6
- .62 Inspect installation and evaluate operation of repaired or newly installed parts and components . . . . . E-6
- .80 Analyze reports of discrepancies and malfunctions in aircraft electrical systems and determine corrective action . . . . . E-7
- .81 Review and evaluate completed inspection forms, work orders, and failure and discrepancy reports . . . . . E-7
- .82 Diagnose intermittent, recurring and interacting electrical malfunctions . . . . . E-7
- .83 Conduct system analysis of malfunctioning aircraft electrical systems and determine causes . . . . . E-7

2.00 Examination Factors

- .01 Types and characteristics of safety wire, bonding, shock mounts and metal fasteners . . . . . E-4
- .02 Types and application of corrosion prevention, preservation and moisture protecting materials used in maintenance of aircraft electrical equipment . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AE

C. AIRCRAFT INSTRUMENT, INDICATING AND WARNING SYSTEMS

1.00 Practical Factors

- .01 Drain pitot-static tubes and clear lines . . . . . E-4
- .02 Locate and correct leaks in pressure tubing lines and static lines . . . . . E-4
- .03 Clean electrical contacts and switches . . . . . E-4
- .04 Install instrument indicator range marks . . . . . E-4
- .05 Remove and replace instrument indicators, transmitters and sensors . . . . . E-4
- .40 Test fire detection and overheat warning systems and replace components . . . . . E-5
- .41 Test and calibrate flight instrument systems . . . . . E-5
- .42 Calibrate fuel quantity indicating systems . . . . . E-5
- .43 Test and adjust position indicating systems . . . . . E-5
- .60 Calibrate engine temperature indicating systems . . . . . E-6
- .61 Test and adjust engine performance indicating and warning systems . . . . . E-6
- .62 Test, adjust and calibrate aircraft instruments . . . . . E-6

2.00 Examination Factors

- .01 Types and operating principles of mechanical and electrical aircraft instruments and warning systems . . . . . E-4

D. AIRCRAFT LIGHTING AND WIRING

1.00 Practical Factors

- .01 Inspect aircraft electrical wiring for chafing, heat and oil damage, and deterioration caused by flexing . . . . . E-4
- .02 Make point-to-point continuity and resistance checks of lighting circuits to localize abnormal conditions . . . . . E-4
- .03 Perform operational tests of interior and exterior aircraft lighting systems; replace bulbs, lamp assemblies, coder flashers, dimmer controls, switches and related electrical components . . . . . E-4
- .04 Repair damaged aircraft electrical wiring, using splicing, crimping and soldering techniques . . . . . E-4
- .40 Fabricate and install aircraft electrical cables . . . . . E-5
- .41 Perform insulation resistance tests on aircraft electrical wiring with high voltage insulation tester . . . . . E-5
- .60 Inspect newly installed aircraft wiring for compliance with military specifications . . . . . E-6

2.00 Examination Factors

- .01 Types of information contained in wire identification and military standard connector codes . . . . . E-4
- .40 Procedures for installing and replacing aluminum wire . . . . . E-5
- .41 Principles and operation of aircraft JATO and external stores electrical circuits.(Note: Personnel in the AO rating perform functional tests on these circuits and personnel in the AE rating repair them.) . . . . . E-5

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
AE

**D. AIRCRAFT LIGHTING AND WIRING - Continued**

**2.00 Examination Factors - Continued**

- .42 Factors affecting current carrying capacity of wires and cables . . . . E-5
- .60 Operating principles of aircraft searchlights and associated control systems . . . . . E-6

**E. AIRCRAFT ELECTRICAL POWER SYSTEMS**

**1.00 Practical Factors**

- .01 Measure electrical current, voltage, frequency, and power output of aircraft power generating equipment . . . . . E-4
- .02 Test and replace aircraft batteries . . . . . E-4
- .03 Test and replace electrical circuit components, such as switches, relays, circuit breakers, and fuse holders . . . . . E-4
- .04 Test generator armatures and field windings for opens and shorts . . . . E-4
- .05 Replace and fit generator brushes . . . . . E-4
- .40 Inspect, clean, and replace aircraft generators . . . . . E-5
- .41 Perform operational checks of aircraft generators, voltage regulators, and reverse-current relays using generator test stand . . . . . E-5
- .42 Check phase sequence on three-phase generators and inverters . . . . . E-5
- .43 Test and adjust voltage regulators and reverse-current relays; parallel aircraft generator output . . . . . E-5
- .44 Adjust inverter speed control governors . . . . . E-5
- .60 Make three-phase wye and delta connections of transformers . . . . . E-6
- .80 Brief flight personnel on power distribution bus connections and methods of supplying electrical loads under normal and emergency conditions . . . . . E-7

**2.00 Examination Factors**

- .01 Operating principles and types of d.c. motors and generators . . . . . E-4
- .02 Procedures for recharging aircraft batteries and mixing electrolyte . . . . E-4
- .02 Operating principles and types of a.c. motors and generators . . . . . E-4
- .40 Operating principles, characteristics, and functions of under-frequency, over-voltage, and other protective and control devices used in a.c. distribution systems . . . . . E-5
- .41 Operating principles of vacuum, gas-filled, and solid state rectifiers . . . . . E-5
- .42 Operating principles of auxiliary power units installed in aircraft . . . . E-5
- .60 Procedures for phase load balancing and power factor correction . . . . . E-6

**F. AIRCRAFT ENGINE, PROPELLER, AND UTILITY ELECTRICAL SYSTEMS**

**1.00 Practical Factors**

- .01 Disconnect and test electrical components of hydraulic valves and actuators . . . . . E-4
- .02 Make connections of electrical wiring and instrument tubing for aircraft engine installation . . . . . E-4



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AE

F. AIRCRAFT ENGINE, PROPELLER, AND UTILITY ELECTRICAL SYSTEMS - Continued

1.00 Practical Factors - Continued

- .40 Perform electrical and insulation tests on aircraft ignition system components . . . . . E-5
- .41 Test, adjust, and replace electrical components of aircraft pressurization and cabin temperature control systems . . . . . E-5
- .42 Inspect, clean, and replace aircraft electrical starters . . . . . E-5
- .43 Perform operational test of aircraft fuel transfer systems to identify electrical malfunctions . . . . . E-5
- .44 Inspect completed engine buildups for proper connection of electrical accessories, proper installation and marking of wiring and tubing, and proper routing of wiring and tubing . . . . . E-5
- .60 Diagnose electrical malfunctions of aircraft pressurization and cabin temperature control systems . . . . . E-6
- .61 Diagnose malfunctions of starting control electrical circuits . . . . . E-6
- .62 Test, adjust, and replace electrical components of automatic temperature control systems . . . . . E-6
- .63 Inspect completed engine buildups for incorporation of prescribed electrical changes and modifications . . . . . E-6
- .64 Diagnose malfunctions in engine analyzers . . . . . E-6
- .65 Maintain, test, and adjust electric and/or electronic control systems of aircraft propellers and engines . . . . . E-6

2.00 Examination Factors

- .01 Methods of operation of aircraft electrical deicing and anti-icing systems . . . . . E-4
- .40 Operating principles of aircraft ignition systems . . . . . E-5
- .41 Operating principles of automatic engine temperature controlled systems which actuate oil cooler doors and cowl flaps . . . . . E-5
- .42 Operating principles of aircraft propeller electrical control systems including: feathering, reversing systems . . . . . E-5
- .60 Operating principles of aircraft propeller synchrophasing systems . . . . . E-6
- .61 Operating principles of electronic temperature datum controls . . . . . E-6

G. AIRCRAFT AUTOMATIC FLIGHT CONTROL SYSTEMS

1.00 Practical Factors

- .01 Perform operational checks of aircraft electrical compass systems . . . . . E-4
- .02 Test, select, and replace circuit parts, including electron tubes and transistors . . . . . E-4
- .40 Swing and compensate aircraft compasses . . . . . E-5
- .41 Diagnose malfunctions in aircraft compass systems to defective units . . . . . E-5
- .60 Perform operational checks of aircraft automatic flight control systems, including the use of line maintenance testers . . . . . E-6
- .61 Make voltage and trim adjustments to aircraft automatic flight control systems . . . . . E-6
- .62 Perform bench test of aircraft automatic flight control system units prior to installation . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AE

G. AIRCRAFT AUTOMATIC FLIGHT CONTROL SYSTEMS - Continued

1.00 Practical Factors - Continued

- .63 Replace control surface servoactuators of aircraft automatic flight control systems . . . . . E-6
- .64 Isolate circuit faults in defective units of aircraft compass systems. . E-6
- .65 Diagnose malfunctions in aircraft automatic flight control systems . . . E-6
- .80 Perform operational checks of aircraft automatic flight control and flight director systems . . . . . E-7

2.00 Examination Factors

- .60 Operating principles of direction and attitude sensing elements, including gyros, compasses, and accelerometers . . . . . E-6
- .61 Operating principles of airstream direction detectors and stall warning systems . . . . . E-6
- .62 Principles of control and stability of aircraft in flight . . . . . E-6
- .63 Operating principles of servo amplifiers, including theory of magnetic amplifiers and transistor circuits . . . . . E-6
- .80 Types and characteristics of automatic flight control and flight director systems . . . . . E-7

H. THEORY AND PRINCIPLES

1.00 Practical Factors

None.

2.00 Examination Factors

- .01 Meaning of electrical units of measure and electrical terms . . . . . E-4
- .02 Principles of basic machines . . . . . E-4
- .03 Theory of a.c. and d.c. electricity and principles of magnetism . . . . . E-4
- .04 Elementary physics of heat, fluids, gases, and electricity . . . . . E-4
- .05 Principles of electromagnetic induction . . . . . E-4
- .40 Principles and uses of synchros . . . . . E-5
- .41 Functions and characteristics of electronic circuit parts . . . . . E-5
- .42 Principles of electron tubes, semi-conductors, and associated circuits . . . . . E-5
- .43 Principles of rectifiers, filters, and regulators in electronic power supply circuits . . . . . E-5
- .44 Principles of phase inverters and cathode followers . . . . . E-5
- .60 Principles of limiter, clamper, and detector circuits . . . . . E-6
- .61 Principles of resonant circuits, coupling circuits, and filter networks . . . . . E-6
- .62 Principles of oscillators, amplifiers, and signal discriminating circuits . . . . . E-6
- .80 Factors causing and methods of locating, suppressing, and eliminating electrical noise interference . . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AE

I. TEST EQUIPMENT, DRAWINGS, SCHEMATICS, AND PUBLICATIONS

1.00 Practical Factors

- .01 Select, use, and care for common hand tools and electrical measuring instruments . . . . . E-4
- .02 Use electrical wiring diagrams to trace circuits . . . . . E-4
- .03 Use manuals of maintenance and service instructions to locate and identify components of aircraft electrical systems . . . . . E-4
- .40 Follow pictorial diagrams and service instructions to disassemble, clean, and lubricate electrical equipment . . . . . E-5
- .41 Use system block diagrams, data flow charts, and inter-connection tables and diagrams in checking electrical and instrument system performance . . . . . E-5
- .42 Complete electrical and instrument sections of inventory logs and records on receipt or transfer of or changes to aircraft . . . . . E-5
- .43 Use electronic schematics, hookup diagrams, and mechanical drawings to install aviation electrical equipment . . . . . E-5
- .60 Interpret test equipment calibration charts and curves . . . . . E-6
- .61 Use manuals of maintenance and service instructions to determine performance specifications for making adjustments to electrical equipment . . . . . E-6
- .62 Interpret electrical and electronic schematics and drawings and make simplified versions . . . . . E-6

2.00 Examination Factors

- .01 Simple meter movements, including function of shunts and multiplier resistors . . . . . E-4
- .02 Theory and operating characteristics of basic electrical measuring instruments . . . . . E-4
- .03 Kinds of information contained in aircraft manuals of maintenance instructions . . . . . E-4
- .04 Types of information shown on electrical schematics, drawings, and blueprints . . . . . E-4
- .40 Systems of nomenclature employed to identify aviation electrical components and systems . . . . . E-5
- .41 Effects of meter sensitivity on voltage measurements . . . . . E-5
- .42 Purpose and application of instrument field and instrument special test equipment provided for field level maintenance . . . . . E-5
- .60 Procedures for obtaining repair and calibration of electrical test equipment . . . . . E-6
- .61 Purpose and application of measuring instruments, including oscilloscopes, vacuum tube voltmeters, and Wheatstone bridges . . . . . E-6

J. OPERATIONAL

1.00 Practical Factors

- .40 Be familiar with weight and balance procedures . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AE

J. OPERATIONAL - Continued

1.00 Practical Factors - Continued

- .60 If assigned to activities requiring flight mechanics, perform the following:
  - a. Follow proper engineering procedure and take necessary action in inspecting, testing, and operating engine controls and equipment on own aircraft before flight, during ground operations, and all flight conditions . . . . . E-6
  - b. Set engine controls for various conditions in accordance with standard operating procedures . . . . . E-6
  - c. Recognize specific signs of malfunctioning of engines from observation of instruments and/or engine analyzer, if installed; and when possible, make adjustments in flight . . . . . E-6
  - d. Have knowledge of aircraft performance charts . . . . . E-6

2.00 Examination Factors

None.

K. ADMINISTRATION

1.00 Practical Factors

- .01 Know purpose of inspection forms, work orders, unsatisfactory reports, and other related maintenance forms . . . . . E-4
- .40 Make entries in inspection forms, work orders, and unsatisfactory reports (UR) . . . . . E-5
- .41 Identify and order tools, equipment, and material . . . . . E-5
- .60 Use Coast Guard publications; Navy Stock List, NavSandA 2002, Section VIII, to locate, identify, and obtain technical publications, directives, and manuals . . . . . E-6
- .61 Identify electrical parts by nomenclature and stock numbers and prepare supply requisitions to obtain replacements . . . . . E-6
- .62 Make entries on Usage Data Report forms and prepare for submission . . . . . E-6
- .80 Review completed work orders and maintain electrical shop work logs. . . . . E-7
- .81 Supervise the use, filing, and maintenance of publications, logs, and records . . . . . E-7
- .82 Screen electrical maintenance directives for applicability and prepare drafts of work orders . . . . . E-7
- .83 Screen defective exchangeable electrical components and instruments for feasibility of local repair in lieu of exchange . . . . . E-7
- .84 Organize and supervise facilities for repair and maintenance of aircraft electrical equipment . . . . . E-7
- .85 Maintain electrical configuration and status boards . . . . . E-7
- .86 Supervise inspection procedures to insure that applicable technical specifications and standards of workmanship are met . . . . . E-7

2.00 Examination Factors

- .01 General knowledge of Coast Guard aviation organization and SAR operational plans . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AE

K. ADMINISTRATION - Continued

2.00 Examination Factors - Continued

.02	Types of information contained in periodic checklists, serial, standing, and aircraft work orders . . . . .	E-4
.40	Types of information contained in Unsatisfactory Reports of defective aircraft equipment . . . . .	E-5
.60	Interpretation and application of Airplane or Helicopter Changes and Bulletins; Aviation Technical Orders and Notes (ATO's and ATN's) . .	E-6
.61	Standard organization and maintenance procedures of Air Stations and Air Detachments . . . . .	E-6
.62	Organization and functions of the Aviation Supply System . . . . .	E-6
.63	Types of information to be recorded in each section of the Aircraft Log Book, Aeronautical Equipment Service Record, and Historical Records . . . . .	E-6
.64	Types of information contained in aeronautical materials and equipment publications pertaining to aeronautical materials and equipment . . . . .	E-6
.80	Procedures for requesting manufacture and open purchase of aircraft equipment . . . . .	E-7
.81	Procedures for turning in and surveying aircraft equipment . . . . .	E-7
.82	Use of applicable allowance lists, parts catalogs, and forms in the requisitioning, inventorying, and accounting for aviation materials and equipment . . . . .	E-7
.83	Purposes and procedures for man-hour accounting . . . . .	E-7

★ SENIOR CHIEF AVIATION ELECTRICIAN'S MATE (AECS)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

.90	Plan a program of safety instruction and inspection pertaining to aircraft electrical systems, equipment, and assigned work areas . . . .	E-8
.91	Recommend changes in methods and techniques to promote maximum ground safety, safety of flight, and operational readiness of aircraft . . . . .	E-8
.92	Interpret information contained in technical publications pertaining to aircraft electrical systems, test, and support equipment . .	E-8
.93	Interpret maintenance instructions and directives to identify those applicable to aircraft electrical systems and associated equipment and convert into maintenance documents or instructions . . .	E-8
.94	Review, evaluate, and recommend improvements or changes to aircraft electrical systems and equipment test procedures . . . . .	E-8
.941	Ensure that established procedures are observed for conducting ground tests and for preflight and periodic inspections to maintain desired quality level . . . . .	E-8
.942	Evaluate requirements and submit requests for technical assistance from contractor representatives and other maintenance support sources . . . . .	E-8
.943	Review material allowance lists periodically for adequacy and make recommendations for changes as necessary . . . . .	E-8
.944	Draft letters, instructions, notices, and messages applicable to avionics maintenance activities . . . . .	E-8

SENIOR CHIEF AVIATION ELECTRICIAN'S MATE (AECS) - Continued

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AE

2.00 Examination Factors

- .90 Capabilities, limitations, and reliability of aircraft electrical equipment and associated systems . . . . . E-8
- .91 Principles and procedures for casualty analysis of aircraft electrical systems and related support equipment . . . . . E-8
- .92 Principles, methods, and techniques of preventive maintenance and quality control management procedures . . . . . E-8
- .93 Material control organization and logistic requirements in support of the Coast Guard Aircraft Maintenance Program . . . . . E-8
- .94 Methods for requisition, inventory, conservation, disposition, and survey of aviation electrical material and equipment . . . . . E-8

★ MASTER CHIEF AVIATION ELECTRICIAN'S MATE (AECM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Formulate guidelines to be used in safety inspections and instructions concerning potentially hazardous conditions and practices . . . . . E-9
- .96 Evaluate operational requirements, schedules, and production capabilities to assist in planning workload and forecasting workload requirements . . . . . E-9
- .97 Assist in statistical analyses of aircraft accident reports to determine causes . . . . . E-9
- .98 Establish and implement a program for examining, interviewing, evaluating, and assigning personnel to ensure maximum utilization . . . . . E-9
- .99 Monitor implementation of preventive maintenance procedures to ensure current directives are being enforced . . . . . E-9

2.00 Examination Factors

- .95 Methods and procedures for preparing and submitting avionics evaluation and staff type studies . . . . . E-9
- .96 Concepts and techniques of aircraft maintenance management . . . . . E-9

## AVIATION ELECTRONICS TECHNICIAN (AT)

### GENERAL RATING

#### SCOPE

Aviation Electronics Technicians test, maintain, and repair aviation electronic equipment; inspect, clean, lubricate, and make operational tests and adjustments of communication, navigation, search, identification, electronic countermeasures detection, and relay equipment; remove and reinstall components, assemblies and subassemblies; calibrate, repair, and make performance measurements; make detailed mechanical, electrical, and electronic casualty analysis; align communication, navigation, search, identification, display, and relay equipment; make authorized repairs and adjustments to associated test equipment; and act as aircraft communicators when required.

#### SERVICE RATINGS (PO3 and PO2)

#### SCOPES

##### AVIATION ELECTRONICS TECHNICIAN N (Radio and Radio Navigation Equipment) - ATN

Aviation Electronics Technicians (N) inspect and maintain aviation electronic identification, radio communication, and radio navigation equipment, including radio transmitting, receiving, relaying, and direction finding equipment; radio and radar altimeters; electronic interrogating and transponding equipment; distance and time difference measuring equipment; and related equipment and test equipment.

##### AVIATION ELECTRONICS TECHNICIAN R (Radar and Radar Navigation Equipment) - ATR

Aviation Electronics Technicians (R) inspect and maintain aviation radar and electronic identification equipment, including: radar; radar display and relay equipment; electronic interrogating and transponding equipment; and related equipment and test equipment.

#### QUALIFICATIONS FOR ADVANCEMENT

	Required for Advancement to		
	AT	ATN	ATR
<b>A. SAFETY</b>			
1.00 Practical Factors			
.01 Observe safety precautions in:			
a. Making adjustments and measurements on energized electrical and electronic equipment . . . . .	E-4	E-4	E-4
b. Working with deenergized equipment to eliminate hazards of residual charges . . . . .	E-4	E-4	E-4
c. Handling, stowing and disposing of radioactive, cathode-ray and fluorescent tubes . . . . .	E-4	E-4	E-4
d. Operating radio transmitters in aircraft and in energizing and directing radar antennas . . . . .	E-4	E-4	E-4
.02 Demonstrate under simulated conditions, the rescue of a person in contact with an energized circuit, resuscitation of a person unconscious from electrical shock . . . . .	E-4	E-4	E-4
.80 Interpret directives and instructions on safety precautions to identify those applicable to electronic work areas and equipment; establish safeguards, procedures and standards to ensure compliance by personnel supervised . . . . .	E-7	-	-
.81 Inspect work areas, tools and equipment to detect potentially hazardous and unsafe conditions and take appropriate corrective action . . . . .	E-7	-	-
.82 Organize and administer a program of safety instruction applicable to aviation electronic equipment and facilities . . . . .	E-7	-	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AT ATN ATR

A. SAFETY - Continued

2.00 Examination Factors

- .01 Effects of electrical shock, methods of resuscitation of a person unconscious from electrical shock . . . . . E-4 E-4 E-4
- .02 Possess a knowledge of general aviation safety . . . . . E-4 E-4 E-4

B. AIRCRAFT ELECTRONICS LINE AND HANGAR MAINTENANCE

1.00 Practical Factors

- .01 Select, use and care for common handtools . . . . . E-4 E-4 E-4
- .02 Remove and install units of aircraft electronic systems . . . . . E-4 E-4 E-4
- .03 Make tests for short circuits, grounds and continuity of inter-connecting cables between units of electronic equipment . . . . . E-4 E-4 E-4
- .04 Clean, lubricate and service aircraft electronic equipment for normal preventive maintenance and salt water immersion . . . . . E-4 E-4 E-4
- .05 Check aircraft electronic equipment for proper pressurization; correct for leaks . . . . . E-4 E-4 E-4
- .06 Make entries in inspection forms, work orders and failure reports . . . . . E-4 E-4 E-4
- .07 Perform daily and preflight inspections of electronics equipment for security of mounting, evidence of damage and proper operation . . . . . E-4 E-4 E-4
- .08 Make electrical connections, including splices and soldering . . . . . E-4 E-4 E-4
- .40 Verify discrepancies in:
  - a. Aircraft navigation and communications equipment . . . . . E-5 E-5 -
  - b. Aircraft radar equipment . . . . . E-5 - E-5
- .41 Isolate equipment malfunctions in:
  - a. Navigation and communications equipment to defective units. . . . . E-5 E-5 -
  - b. Radar equipment to defective units . . . . . E-5 - E-5
- .42 Perform intermediate and major aircraft:
  - a. Navigation and communications equipment inspections . . . . . E-5 E-5 -
  - b. Radar equipment inspections . . . . . E-5 - E-5
- .43 Perform operational tests of:
  - a. Aircraft navigation and communications equipment . . . . . E-5 E-5 -
  - b. Aircraft radar equipment . . . . . E-5 - E-5
- .60 Make qualitative performance tests of aircraft electronic systems . . . . . E-6 - -
- .61 Supervise and direct electronics line and hangar maintenance; inspect completed work . . . . . E-6 - -
- .62 Debrief flight crews and evaluate reported discrepancies . . . . . E-6 - -
- .63 Analyze reports of discrepancies and malfunctions in aircraft electronic systems and determine corrective action . . . . . E-6 - -
- .80 Evaluate performance of overhauled, modified or newly installed aircraft electronic equipment . . . . . E-7 - -

2.00 Examination Factors

- .01 Cable, wire and connector identification and marking systems. . . . . E-4 E-4 E-4
- .02 Types and characteristics of safety wire, bonding, shock mounts and metal fasteners . . . . . E-4 E-4 E-4



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AT ATN ATR

B. AIRCRAFT ELECTRONICS LINE AND HANGAR MAINTENANCE - Continued

2.00 Examination Factors - Continued

.03	Types and applications of:			
a.	Electrical circuit protective devices . . . . .	E-4	E-4	E-4
b.	Corrosion prevention, preservation and moisture protecting materials used in maintenance of aircraft electronic equipment . . . . .	E-4	E-4	E-4
.04	Function and use of the following test equipment in line maintenance:			
a.	Ohmmeter . . . . .	E-4	E-4	E-4
b.	Voltmeter . . . . .	E-4	E-4	E-4
c.	Megger . . . . .	E-4	E-4	E-4
d.	Echo box . . . . .	E-4	-	E-4
e.	Signal generators (portable line maintenance type) . . . . .	E-4	E-4	E-4
f.	Dummy loads . . . . .	E-4	E-4	E-4
.05	Soldering materials and methods of soldering used in line maintenance and repair of electrical and electronic equipment . .	E-4	E-4	E-4
.06	Purpose of anti-precipitation wire and static wick dischargers. .	E-4	E-4	E-4
.40	Requirements for auxiliary ground cooling of aircraft electronic equipment . . . . .	E-5	E-5	E-5

C. AIRCRAFT ELECTRONICS SHOP PRACTICES

1.00 Practical Factors

.01	Clean commutators and slip ring assemblies and replace brushes. .	E-4	E-4	E-4
.02	Use circuit and signal tracing techniques to locate defective parts within a circuit . . . . .	E-4	E-4	E-4
.03	Make point-to-point voltage and resistance measurements . . . . .	E-4	E-4	E-4
.04	Test, select and replace circuit parts, including electron tubes . . . . .	E-4	E-4	E-4
.05	Remove, install, mechanically align and electrically zero synchros . . . . .	E-4	E-4	E-4
.06	Incorporate Avionics changes in aviation electronic equipment . .	E-4	E-4	E-4
.40	Select proper wire and fabricate aircraft electronic equipment interconnecting cables . . . . .	E-5	E-5	E-5
.41	Analyze operation of units and isolate malfunctions to defective circuits in:			
a.	Aircraft navigation and communications equipment . . . . .	E-5	E-5	-
b.	Aircraft radar equipment . . . . .	E-5	-	E-5
.42	Perform waveform analysis . . . . .	E-5	E-5	E-5
.43	Make phase, balance and feedback adjustments to servo amplifiers . . . . .	E-5	E-5	E-5
.44	Adjust and align parts or circuitry to conform with allowable limits in units, assemblies or subassemblies in:			
a.	Aircraft navigation and communications equipment . . . . .	E-5	E-5	-
b.	Aircraft radar equipment . . . . .	E-5	-	E-5
.60	Supervise the incorporation of aircraft changes involving aircraft electronic equipment . . . . .	E-6	-	-
.61	Inspect completed repairs to aircraft electronic equipment . . .	E-6	-	-
.62	Inspect installation and evaluate operation of repaired or newly installed parts and components . . . . .	E-6	-	-

QUALIFICATIONS FOR ADVANCEMENT

		Required for Advancement to		
		AT	ATN	ATR
<b>C. AIRCRAFT ELECTRONICS SHOP PRACTICES - Continued</b>				
1.00	Practical Factors - Continued			
.80	Analyze discrepancy trends, determine deficiencies, and develop inspection procedures . . . . .	E-7	-	-
.81	Supervise the technical maintenance effort and evaluate procedures . . . . .	E-7	-	-
.82	Screen defective exchangeable components for feasibility of local repair . . . . .	E-7	-	-
.83	Review and evaluate completed inspection forms, work orders, and failure and discrepancy reports . . . . .	E-7	-	-
2.00	Examination Factors			
.01	Soldering material and techniques in shop maintenance of aviation electronic equipment . . . . .	E-4	E-4	E-4
.02	Systems of nomenclature employed to identify aviation electronics systems, components and material . . . . .	E-4	E-4	E-4
.40	Methods of troubleshooting:			
	a. Aircraft navigation and communications equipment and their applications . . . . .	E-5	E-5	-
	b. Aircraft radar equipment and their applications . . . . .	E-5	-	E-5
.41	Procedures for repairing printed circuits and techniques for testing transistor circuits . . . . .	E-5	E-5	E-5
.80	Sources of electrical noise interference and methods of control . . . . .	E-7	-	-
.81	Effects of environmental conditions upon operation of electronic and electrical equipment . . . . .	E-7	-	-
<b>D. AIRCRAFT NAVIGATION EQUIPMENT MAINTENANCE</b>				
1.00	Practical Factors			
.01	Perform routine preventive maintenance, preliminary troubleshooting and minor repair on aircraft navigation equipment . . .	E-4	E-4	-
.02	Adjust and calibrate loran equipment . . . . .	E-4	E-4	-
.03	Set compensation of ADF loop antennas . . . . .	E-4	E-4	-
.04	Make ground checks of electronic altimeters using a delay line. .	E-4	E-4	-
.05	Use portable beacon simulator to test operation of TACAN equipment . . . . .	E-4	E-4	-
.06	Perform flag sensitivity adjustments on omnirange receivers . . .	E-4	E-4	-
.07	Measure and adjust low voltage power supplies . . . . .	E-4	E-4	-
.40	Bench test and align ADF equipment . . . . .	E-5	E-5	-
.41	Bench test and calibrate electronic altimeters . . . . .	E-5	E-5	-
.42	Bench test and align TACAN . . . . .	E-5	E-5	-
.60	Repair and adjust automatic channel selecting and automatic tuning assemblies . . . . .	E-6	-	-
.61	Test and adjust TACAN beacon simulator . . . . .	E-6	-	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AT ATN ATR

D. AIRCRAFT NAVIGATION EQUIPMENT MAINTENANCE - Continued

2.00 Examination Factors

.39	General characteristics of:			
a.	LORAN A/C . . . . .	E-4	E-4	-
b.	ADF . . . . .	E-4	E-4	-
c.	TACAN . . . . .	E-4	E-4	-
d.	RADIO ALTIMETER . . . . .	E-4	-	E-4
e.	VOR/ILS . . . . .	E-4	E-4	-
f.	IFF/SIF . . . . .	E-4	-	E-4
g.	SEARCH RADAR . . . . .	E-4	-	E-4
h.	DOPPLER RADAR . . . . .	E-5	-	E-5
i.	AUTOMATIC FLIGHT CONTROL SYSTEM . . . . .	E-5	E-5	-
j.	NAVIGATION COMPUTERS . . . . .	E-6	-	-
k.	RADIOMETRIC DEVICES . . . . .	E-7	-	-
.60	Procedures for plotting deviation curves for aircraft ADF configuration . . . . .	E-6	-	-

E. AIRCRAFT COMMUNICATIONS EQUIPMENT MAINTENANCE AND OPERATION

1.00 Practical Factors

.01	Perform routine preventive maintenance, preliminary troubleshooting and minor repair on aircraft communications equipment. . . . .	E-4	E-4	-
.02	Repair and replace communications antennas and feed systems . . . . .	E-4	E-4	-
.03	Set and adjust transceivers in accordance with frequency plans. . . . .	E-4	E-4	-
.04	Make receiver squelch adjustments . . . . .	E-4	E-4	-
.05	Stand airborne watch on:			
a.	Voice radio circuit . . . . .	E-4	-	-
b.	CW radio circuit at 8 WPM under adverse conditions; keep required log (hand printing) . . . . .	E-4	-	-
.06	Interpret radar screen . . . . .	E-4	-	E-4
.07	Interpret identification equipment screen . . . . .	E-4	-	E-4
.40	Measure receiver sensitivity and transmitter power output . . . . .	E-5	E-5	-
.41	Determine percentage of modulation of transmitters . . . . .	E-5	E-5	-
.42	Make transmitter and receiver frequency calibrations . . . . .	E-5	E-5	-
.43	Perform alignment and tracking adjustments of transceivers . . . . .	E-5	E-5	-
.44	Stand airborne watch on CW radio circuit under adverse conditions at 12 WPM; keep required log (hand printing) . . . . .	E-5	-	-

2.00 Examination Factors

.01	Thorough knowledge of procedures and considerations when testing ON-THE-AIR communications equipment . . . . .	E-4	E-4	-
.02	Have a general knowledge of the organization, function and the facilities of the Armed Forces and the Federal Communications Commission Systems and rules insofar as effecting aircraft voice communications . . . . .	E-4	E-4	-
.03	Possess a working knowledge of Coast Guard communications procedures . . . . .	E-4	E-4	-
.04	Know most often used "Q" signals . . . . .	E-4	E-4	-
.05	Principles of and requirements of communications security . . . . .	E-4	E-4	E-4
.06	Distress communications frequencies and procedures, including "Q" signals . . . . .	E-4	E-4	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AT ATN ATR

E. AIRCRAFT COMMUNICATIONS EQUIPMENT MAINTENANCE AND OPERATION -  
Continued

2.00 Examination Factors - Continued

.40	Have a working knowledge of contents of JANAP's CG-235 and ACP's carried at own station; know how to communicate with a merchant vessel at sea, and the regulations for communications pertaining to safety of life at sea. . . . .	E-5	E-5	-
.60	Communications antenna theory. . . . .	E-6	-	-
.80	Characteristics of induction field, radiation field, sky wave, ground wave, ground-reflected wave, ionospheric reflecting layers, skip distances, and maximum usable frequency and their effects on communications. . . . .	E-7	-	-

F. THEORY AND PRINCIPLES

1.00 Practical Factors

None.

2.00 Examination Factors

.01	Meaning of electrical and electronic terms and units of measure. . . . .	E-4	E-4	E-4
.02	Function and characteristics of electronic circuit parts . . . . .	E-4	E-4	E-4
.03	Principles of electron tubes, semi-conductors and transistors. . . . .	E-4	E-4	E-4
.04	Theory of a.c. and d.c. electricity and principles of magnetism. . . . .	E-4	E-4	E-4
.05	Principles of rectifiers, filters and regulators in power supply circuits. . . . .	E-4	E-4	E-4
.06	Principles of:			
	a. Basic machines . . . . .	E-4	E-4	E-4
	b. Amplitude and frequency modulation . . . . .	E-4	E-4	E-4
	c. Electromagnetic induction and application to transformers, motors, and generators . . . . .	E-4	E-4	E-4
.07	Principles and applications of:			
	a. Heterodyning . . . . .	E-4	E-4	E-4
	b. Synchronos and servosystems. . . . .	E-4	E-4	E-4
.39	Principles of:			
	a. Detectors, amplifiers and oscillators. . . . .	E-4	E-4	E-4
	b. Phase inverters and cathode followers. . . . .	E-5	E-5	E-5
	c. LCR differentiating and integrating circuits . . . . .	E-5	E-5	E-5
	d. Pulse and pulse-time modulation. . . . .	E-5	E-5	E-5
.40	Types and characteristics of computing elements used to solve mathematical relationships . . . . .	E-5	E-5	E-5
.41	Principles and applications of gas filled and cathode ray tubes. . . . .	E-5	E-5	E-5
.42	Principles of:			
	a. Resonant circuits, coupling circuits and filter networks . . . . .	E-5	E-5	E-5
	b. Klystrons and magnetrons . . . . .	E-5	E-5	E-5
.60	Operating principles of direction and attitude sensing elements, including gyros, compasses and accelerometers. . . . .	E-6	-	-
.61	Principles and applications of limiter, clamper, counter and discriminator circuits . . . . .	E-6	-	-
.62	Principles of sweep generators, gated amplifiers and timing circuits . . . . .	E-6	-	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AT ATN ATR

F. THEORY AND PRINCIPLES - Continued

2.00 Examination Factors - Continued

.63	Microwave techniques and operating principles of wave guides, cavities, crystal mixers and transmission lines. . . . .	E-6	-	-
.64	Principles and applications of saturable core reactors and magnetic amplifiers. . . . .	E-6	-	-
.65	Principles of impedance matching networks and devices. . . . .	E-6	-	-
.80	Characteristics of readout methods used with analog and digital computing systems. . . . .	E-7	-	-
.81	Principles of infrared detection . . . . .	E-7	-	-
.82	Operating principles of microwave antennas, dish reflectors, and associated RF feeds and parasitic reflectors and directors . . . . .	E-7	-	-

G. TEST EQUIPMENT

1.00 Practical Factors

.39	Select, use and make minor repairs to:			
	a. Test equipment used to measure voltage, current and resistance . . . . .	E-4	E-4	E-4
	b. Signal generators and oscilloscopes. . . . .	E-5	E-5	E-5
	c. Current, voltage and resistance measuring devices (Perform Qualification Tests, utilizing available calibration equipment.) . . . . .	E-6	-	-
.60	Analyze tests and measurements to be made on electronic equipment and determine most appropriate test equipment to use. . . . .	E-6	-	-
.61	Analyze test equipment defects and determine corrective action . . . . .	E-6	-	-

2.00 Examination Factors

.01	Theory and operating characteristics of basic electrical measuring instruments. . . . .	E-4	E-4	E-4
.40	Types and applications of general purpose electronics test equipment. . . . .	E-5	E-5	E-5
.41	Circuit loading effects of test equipment. . . . .	E-5	E-5	E-5
.60	Procedures for obtaining repair and calibration of test equipment. . . . .	E-6	-	-
.80	Electronics test methods and practices . . . . .	E-7	-	-

H. DRAWINGS, SCHEMATICS AND PUBLICATIONS

1.00 Practical Factors

.01	Use manuals of maintenance and service instructions to locate and identify units of aircraft electronic equipment. . . . .	E-4	E-4	E-4
.02	Use electrical and electronic schematics to trace circuits . . . . .	E-4	E-4	E-4
.03	Follow pictorial diagrams and service instructions to disassemble, clean and lubricate mechanical and electrical equipment. . . . .	E-4	E-4	E-4
.40	Use system block diagrams, data flow charts and interconnection tables and diagrams in checking aircraft electronic equipment. . . . .	E-5	E-5	E-5
.41	Use mechanical, electrical, electronic schematics and drawings in the installation of changes and modifications . . . . .	E-5	E-5	E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AT ATN ATR

H. DRAWINGS, SCHEMATICS AND PUBLICATIONS - Continued

1.00 Practical Factors - Continued

.42	Complete electronics sections of inventory logs and records on receipt or transfer of or changes to aircraft . . . . .	E-5	E-5	E-5
.60	Interpret mechanical, electrical and electronic schematics and drawings; make simplified versions . . . . .	E-6	-	-
.61	Use manuals of maintenance and service instructions to determine performance specifications for making adjustments to aircraft electronic equipment . . . . .	E-6	-	-

2.00 Examination Factors

.01	Types and uses of information contained in manuals relating to operation, servicing, inspection and maintenance of aircraft electronics equipment. . . . .	E-4	E-4	E-4
.02	Types of forms and records used in maintenance and repair of electronic equipment. . . . .	E-4	E-4	E-4
.40	Types and purposes of information found in electronics material bulletins and changes. . . . .	E-5	E-5	E-5
.41	Types of entries made in Electronic portion of Standard Aircraft Log; types of information recorded in reports of equipment failure. . . . .	E-5	E-5	E-5
.42	Purpose and type of information contained in Section "R", Allowance Lists. . . . .	E-5	E-5	E-5
.60	Types of information found in Aircraft Model Changes, Aircraft Model Bulletins, Aviation Technical Notes and Aviation Technical Orders . . . . .	E-6	-	-

I. ADMINISTRATION

1.00 Practical Factors

.01	Prepare failure reports and shop record of maintenance form; complete check lists . . . . .	E-4	E-4	E-4
.40	Prepare shop requisitions for spare parts, tools and material needed to repair:			
	a. Aviation communication and navigation equipment. . . . .	E-5	E-5	-
	b. Aviation radar equipment . . . . .	E-5	-	E-5
.60	Identify electronics parts by nomenclature and stock number and prepare supply requisitions to obtain replacement. . . . .	E-6	-	-
.61	Use Coast Guard publications and NAVAER Publications Index to locate, identify and obtain technical publications, directives and manuals. . . . .	E-6	-	-
.62	Identify and order tools, equipment and material . . . . .	E-6	-	-
.63	Maintain custody records and conduct inventories . . . . .	E-6	-	-
.64	Supervise and train personnel in maintenance and repair of:			
	a. Aviation radar equipment . . . . .	E-6	-	-
	b. Aviation communication and navigation equipment. . . . .	E-6	-	-
.80	Supervise the use, filing and maintenance of publications, logs and records including field changes, etc . . . . .	E-7	-	-
.81	Organize and supervise facilities for repair and maintenance of aircraft electronic equipment . . . . .	E-7	-	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AT ATN ATR

I. ADMINISTRATION - Continued

1.00 Practical Factors - Continued

- .82 Maintain aircraft electronics configuration and status records. . . . E-7 - -
- .83 Supervise inspection procedures to ensure that applicable technical specifications and standards of workmanship are met . . . . E-7 - -
- .84 Evaluate inventories in terms of shop requirements and prepare requisitions to replenish stock and to obtain new items . . . . . E-7 - -

2.00 Examination Factors

- ★.01 Types and uses of EICAM reports . . . . . E-4 E-4 E-4
- ★.02 Types of information contained in CG-165, CG-322, and associated publications pertaining to aircraft electronic material and equipment . . . . . E-4 E-4 E-4
- .60 Standard organization and maintenance procedures of aviation units and maintenance activities . . . . . E-6 - -
- .63 Types and purposes of Unsatisfactory Reports (UR) . . . . . E-6 - -
- .80 Interpretation of source codes in parts catalogs . . . . . E-7 - -
- .81 Procedures for obtaining replacement parts, materials, authorized tools and test equipment for the shop, and for returning defective equipment to supply system for processing and shipment to overhaul and repair facilities . . . . . E-7 - -
- .82 Possess thorough knowledge of reports required for aviation units . . E-7 - -

★ SENIOR CHIEF AVIATION ELECTRONICS TECHNICIAN (ATCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AT

1.00 Practical Factors

- .90 Plan a program of safety instruction and inspection pertaining to aviation electronics, associated equipment, and assigned work areas . . . . . E-8
- .91 Recommend changes in methods and techniques to promote maximum ground safety, safety of flight, and operational readiness of aircraft. . E-8
- .92 Interpret maintenance instructions and directives to identify those applicable to aviation electronic systems and related equipment and convert into maintenance documents and instructions . . . . . E-8
- .93 Ensure that established procedures are observed for conducting ground tests and for preflight and periodic inspections to maintain desired quality level . . . . . E-8
- .94 Evaluate requirements and submit requests for technical assistance from contractor representatives and other maintenance support sources . . E-8
- .941 Review material allowance lists periodically for adequacy and make recommendations for changes as necessary . . . . . E-8
- .942 Review, evaluate, and recommend improvements or changes to aircraft electronic systems and equipment test procedures . . . . . E-8
- .943 Draft letters, instructions, notices, and messages applicable to avionics maintenance activities . . . . . E-8

SENIOR CHIEF AVIATION ELECTRONICS TECHNICIAN (ATCS) - Continued

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AT

- 2.00 Examination Factors
  - .90 Capabilities, limitations, and reliability of aircraft electronic equipment and associated systems . . . . . E-8
  - .91 Regulations governing classification, preparation, safeguarding, and declassification of classified material . . . . . E-8
  - .92 Principles, methods, and techniques of preventive maintenance and quality control management procedures . . . . . E-8
  - .93 Material control organization and logistic requirements in support of the Coast Guard Aircraft Maintenance Program . . . . . E-8

★ MASTER CHIEF AVIATION ELECTRONICS TECHNICIAN (ATCM)

QUALIFICATIONS FOR ADVANCEMENT

- 1.00 Practical Factors
  - .95 Formulate guidelines to be used in safety inspections and instructions concerning potentially hazardous conditions and practices . . . . . E-9
  - .96 Evaluate operational requirements, schedules, and production capabilities to assist in planning workload and forecasting workload requirements . . . . . E-9
  - .97 Establish and implement a program for examining, interviewing, evaluating, and assigning avionics personnel to ensure maximum utilization . . . . . E-9
  - .98 Monitor implementation of preventive maintenance procedures to ensure current directives are being enforced . . . . . E-9
- 2.00 Examination Factors
  - .95 Methods and procedures for preparing and submitting avionics evaluation and staff type studies . . . . . E-9
  - .96 Concepts and techniques of aircraft maintenance management . . . . . E-9



AVIATION MACHINIST'S MATE (AD)

GENERAL RATING

SCOPE

Aviation Machinist's Mates maintain aircraft engines, turbine and reciprocating, and their related systems including the induction, cooling, fuel, oil, compression, combustion, turbine, ignition, propeller and exhaust systems; preflight aircraft; perform intermediate and major inspections on engines and their related systems; field test and adjust components of engines including fuel pumps, valves, regulators, magnetos and other components of the engines and engine related systems; remove, repair and replace compressor turbine blades and combustion chamber liners; maintain and adjust helicopter drive shafting, power transmissions, gear boxes and clutch assemblies; preserve and depreserve engines, engine accessories and components; and supervise engine shops.

NOTE: Practical Factors for the Aviation Machinist's Mate rating are applicable to the Aircraft and equipment assigned or available.

SERVICE RATINGS (FO3, FO2)

SCOPES

AVIATION MACHINIST'S MATE J (Turbojet Engine Mechanic) - ADJ

Aviation Machinist's Mates (J) maintain, service, remove, replace, inspect, test, adjust preserve and depreserve aircraft turbojet power plants and accessories including fuel systems, propellers and associated accessories except fuel cells; operate aircraft turbojet power plants for test purposes.

AVIATION MACHINIST'S MATE R (Reciprocating Engine Mechanic) - ADR

Aviation Machinist's Mates (R) maintain, service, remove, replace, inspect, test, adjust, preserve and depreserve aircraft reciprocating power plants and accessories including fuel systems, propellers and associated accessories except fuel cells; operate aircraft reciprocating power plants for test purposes.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AD ADJ ADR

A. SAFETY

1.00 Practical Factors

.01 Observe Safety precautions:

- a. In the handling, servicing, and line maintenance of aircraft and the use of related tools, equipment and material. . . . . E-4 E-4 E-4
- b. Around turbojet exhausts, propellers and rotary wings to prevent injury to personnel and damage to material . . . . E-4 E-4 E-4
- c. Applicable to fluids under pressure, compressed and liquid gases, strut inflation and aircraft jacking. . . . . E-4 E-4 E-4

.80 Inspect work areas, tools and equipment to detect potential hazardous and unsafe conditions and take appropriate corrective action. . . . . E-7 - -

.81 Organize and administer a program of safety instruction applicable to aircraft powerplant and powerplant related systems . . . . . E-7 - -

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AD ADJ ADR

A. SAFETY - Continued

1.00 Practical Factors - Continued

.82 Interpret directives and instructions on safety precautions to identify those applicable to powerplant work areas and equipment; establish safeguards, procedures and standards to insure compliance by personnel supervised. . . . . E-7 - -

2.00 Examination Factors

.01 Safety precautions to be observed when working on the line and in the hangar or shop and while in flight (except those applicable exclusively to the control of an aircraft) . . . . . E-4 E-4 E-4  
 .02 Safety precautions applicable to aviation personnel to be observed in handling fuels and compressed gases . . . . . E-4 E-4 E-4  
 .03 Emergency procedures and use of standard aviation survival equipment under emergency conditions . . . . . E-4 E-4 E-4

B. AIRCRAFT INSPECTION AND MAINTENANCE

1.00 Practical Factors

.01 Service aircraft on the line and make daily and preflight inspections . . . . . E-4 E-4 E-4  
 .02 Select, use and care for common hand tools. . . . . E-4 E-4 E-4  
 .03 Select and use common aircraft metal fasteners, including safety wire, cotter pins, bolts, nuts and screws. . . . . E-4 E-4 E-4  
 .04 Locate external leaks in aircraft hydraulic, fuel and oil systems . . . . . E-4 E-4 E-4  
 .05 Replace gaskets, packings and seals in fuel and oil systems . . . E-4 E-4 E-4  
 .06 Perform fuel integrity check on aircraft fuel systems . . . . . E-4 E-4 E-4  
 .07 Use schematic diagrams, drawings and charts to trace powerplant related systems. . . . . E-4 E-4 E-4  
 .40 Perform intermediate and major aircraft powerplant inspections . . . . . E-5 E-5 E-5  
 .41 Locate and identify defects in fuel and oil systems . . . . . E-5 E-5 E-5  
 .42 Select and use common aircraft hardware, including fittings, couplings, clamps, brackets and adapters. . . . . E-5 E-5 E-5  
 .43 Make continuity tests using electrical test equipment . . . . . E-5 E-5 E-5  
 .60 Supervise and direct aircraft powerplant inspections. . . . . E-6 - -  
 .61 Inspect installation and evaluate operation of repaired or newly installed powerplants or powerplant system components . . . E-6 - -  
 .62 Use schematic diagrams, drawings and charts in troubleshooting and correcting powerplant system failures. . . . . E-6 - -  
 .63 Supervise and direct engine build-up and engine change. . . . . E-6 - -  
 .80 Analyze reports of aircraft engine discrepancies and malfunctions and determine corrective action. . . . . E-7 - -  
 .81 Review and evaluate completed inspection forms, work orders and failure and discrepancy reports. . . . . E-7 - -

2.00 Examination Factors

.01 Fundamentals of aircraft airframe construction. . . . . E-4 E-4 E-4  
 .02 Fundamentals of hydraulics, electricity and instruments . . . . . E-4 E-4 E-4  
 .03 Types and designations of fuel, oil, hydraulic fluid and lubricants used in aircraft . . . . . E-4 E-4 E-4  
 .04 Types and characteristics of corrosion. . . . . E-4 E-4 E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AD ADJ ADR

B. AIRCRAFT INSPECTION AND MAINTENANCE - Continued

2.00 Examination Factors - Continued

.05	Identification markings and color codes used on aircraft fluid lines . . . . .	E-4	E-4	E-4
.06	Procedures to be followed, and portable equipment used to extinguish fires during the starting and stopping of aircraft engines . . . . .	E-4	E-4	E-4
.07	Use of publications relating to inspection, servicing and maintenance of aircraft, particularly handbooks of inspection requirements, maintenance instructions, service and operating instructions and parts list and catalogs. . . . .	E-4	E-4	E-4
.08	Interpretation of letters and numerals used to designate aircraft engines. . . . .	E-4	E-4	E-4
.09	Procedures for finding correct torque valves for nuts, bolts and locking devices in maintenance publications . . . . .	E-4	E-4	E-4
.10	Precautions to be observed in fueling aircraft to prevent contamination of aircraft fuel system . . . . .	E-4	E-4	E-4
.11	Basic operating principles of aircraft fuel and oil systems . . . . .	E-4	E-4	E-4
.40	Basic helicopter theory of flight and operating principles of power transmissions. (NOTE: The AM rating is responsible for maintenance of rotor blades and rotor heads of helicopters.) . . . . .	E-5	E-5	E-5
.41	Characteristics of metals used in aircraft engines. . . . .	E-5	E-5	E-5
.42	Types and application of corrosion prevention and preservation materials. . . . .	E-5	E-5	E-5
.43	Types, uses and care of aircraft ground handling equipment. . . . .	E-5	E-5	E-5
.60	Procedures for inventory of aircraft. . . . .	E-6	-	-
.61	Procedures for preserving and depreserving aircraft engines and accessories . . . . .	E-6	-	-
.62	Operating principles of aircraft fuel transfer and pressure fueling systems . . . . .	E-6	-	-
.63	Procedures for removal and installation of bladder and self-sealing fuel cells (NOTE: The repair of bladder and self-sealing fuel cells is performed by personnel in the AM rating.) . . . . .	E-6	-	-
.80	Methods of identifying foreign matter found in fuel and oil systems . . . . .	E-7	-	-
.81	Procedures for ordering, inventorying and accounting for Quick Engine Change Kits (Q.E.C.'s) and spare engines, and for disposing of engines removed from service . . . . .	E-7	-	-

C. RECIPROCATING ENGINES

1.00 Practical Factors

.01	Make idle mixture and idle speed adjustments. . . . .	E-4	-	E-4
.02	Make fuel and oil pressure adjustments. . . . .	E-4	-	E-4
.03	Inspect, remove and install spark plugs, leads and coils of reciprocating engines. . . . .	E-4	-	E-4
.04	Clean reciprocating engines . . . . .	E-4	-	E-4
.40	Measure and adjust engine valve clearances; performance compression tests . . . . .	E-5	-	E-5
.41	Perform cylinder changes. . . . .	E-5	-	E-5
.42	Install and time magnetos and distributors using cylinder position, "Time Rite" indicators and timing lights. . . . .	E-5	-	E-5
.43	Remove and install carburetors. . . . .	E-5	-	E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AD ADJ ADR

C. RECIPROCATING ENGINES - Continued

1.00 Practical Factors - Continued

.60	Use engine analyzers, cold cylinder indicators and other electrical test equipment to troubleshoot ignition systems. . . .	E-6	-	-
.61	Rig and adjust throttle, mixture, fuel selector and shutoff valve controls. . . . .	E-6	-	-
.80	Supervise the use of reciprocating engine service, maintenance and test equipment and ensure proper operating techniques by personnel supervised. . . . .	E-7	-	-

2.00 Examination Factors

.01	Procedures for handling, storing and testing spark plugs. . . . .	E-4	-	E-4
.02	Operating principles of high and low tension ignition systems . .	E-4	-	E-4
.03	Operating principles of reciprocating engines . . . . .	E-4	-	E-4
.40	Interrelationships of RPM, MAP, BMEP and Fuel Flow, and their effects on engines and engine performance . . . . .	E-5	-	E-5
.41	Operating principles of aircraft carburetors. . . . .	E-5	-	E-5
.42	Types and designations of aircraft magnetos and carburetors . . .	E-5	-	E-5
.60	Procedures for and purpose of newly installed engine run-in period . . . . .	E-6	-	-
.80	Purpose and use of engine power curves. . . . .	E-7	-	-

D. TURBOJET ENGINES

1.00 Practical Factors

.01	Remove and install ignitor plugs, starting ignition units and leads of ignition and starting systems. . . . .	E-4	E-4	-
.02	Functionally test engine power control mechanisms for proper operation . . . . .	E-4	E-4	-
.03	Operate and service gas turbine starting equipment. . . . .	E-4	E-4	-
.40	Inspect compressors and turbines for proper axial and radial clearances . . . . .	E-5	E-5	-
.41	Turn up engines and check for proper performance. . . . .	E-5	E-5	-
.42	Make fuel and oil pressure adjustments. . . . .	E-5	E-5	-
.43	Perform functional tests on high energy ignition systems. . . . .	E-5	E-5	-
.60	Remove, install and make adjustments to turbojet engine fuel controls . . . . .	E-6	-	-
.61	Install and operate turbojet calibration test units . . . . .	E-6	-	-
.62	Rig and adjust power controls, fuel selectors and shutoff valve linkages. . . . .	E-6	-	-
.63	Supervise and conduct major inspections of turbojet engines . . .	E-6	-	-
.80	Supervise inspection procedures to prevent foreign object damage to turbojet engines. . . . .	E-7	-	-
.81	Determine feasibility of local repairs to turbojet engine components. . . . .	E-7	-	-

2.00 Examination Factors

.01	Operating principles of turbojet engines. . . . .	E-4	E-4	-
.02	Procedures for internal and external cleaning of turbojet engines. . . . .	E-4	E-4	-
.40	Operating principles of turbojet engine fuel pumps and fuel controls. . . . .	E-5	E-5	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AD ADJ ADR

D. TURBOJET ENGINES - Continued

2.00 Examination Factors - Continued

.41	Procedures for repairing and replacing compressor and turbine blades. . . . .	E-5	E-5	-
.42	Procedures for bleeding fuel systems. . . . .	E-5	E-5	-
.43	Operating principles of air turbine starters and gas turbine compressors . . . . .	E-5	E-5	-
.60	Service and repair limits for turbojet engine hot section parts . . . . .	E-6	-	-
.61	Effects of temperature, pressure and other variables on engine performance and thrust . . . . .	E-6	-	-
.80	Procedures and equipment used for class "C" maintenance of turbojet engines. . . . .	E-7	-	-

E. PROPELLERS

1.00 Practical Factors

.01	Clean and service installed propellers. . . . .	E-4	-	-
.02	Field check propeller blade track . . . . .	E-4	-	-
.40	Turn up aircraft engine and test propeller systems. . . . .	E-5	-	-
.41	Remove, install and adjust propeller governors. . . . .	E-5	-	-
.42	Remove, clean and install propeller assemblies. . . . .	E-5	-	-
.60	Rig and adjust propeller control mechanisms (except electrical) . . . . .	E-6	-	-
.61	Troubleshoot and correct propeller system malfunctions by making functional tests and using electrical and mechanical schematic diagrams . . . . .	E-6	-	-

2.00 Examination Factors

.01	Types, designations and operating principles of aircraft propellers. . . . .	E-4	-	-
.02	Procedures for making minor repairs to propeller blades . . . . .	E-4	-	-
.40	Procedures for bench testing propeller governors. . . . .	E-5	-	-
.41	Operating principles of turboprop drive and control systems . . . . .	E-5	-	-
.60	Operating principles of constant speed propellers . . . . .	E-6	-	-
.61	Procedures for disassembly and assembly of propellers . . . . .	E-6	-	-
.62	Operating principles of turboprop aircraft propellers . . . . .	E-6	-	-
.80	Procedures for balancing propeller assemblies . . . . .	E-7	-	-

F. OPERATIONAL

1.00 Practical Factors

.40	Be familiar with weight and balance procedures. . . . .	E-5	E-5	E-5
.60	If assigned to activities requiring flight mechanics, perform the following:			
a.	Follow proper engineering procedure and take necessary action in inspecting, testing and operating engine controls and equipment in own aircraft before flight, during the ground operations and all flight conditions . . . . .	E-6	-	-
b.	Set engine controls for various conditions in accordance with standard operating procedures. . . . .	E-6	-	-

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
AD ADJ ADR

**F. OPERATIONAL - Continued**

1.00 Practical Factors - Continued

- c. Recognize specific signs of malfunctioning of engines from observation of instruments and/or engine analyzer if installed, and when possible, make adjustments in flight. . . . . E-6 - -
- d. Have knowledge of aircraft performance charts . . . . . E-6 - -

2.00 Examination Factors

None.

**G. ADMINISTRATION**

1.00 Practical Factors

- .01 Know purpose of inspection forms, work orders, unsatisfactory reports and other related maintenance forms . . . . . E-4 E-4 E-4
- .40 Make entries in inspection forms, work orders and unsatisfactory reports (UR). . . . . E-5 E-5 E-5
- .41 Make entries in powerplant accessory and component service records . . . . . E-5 E-5 E-5
- .60 Use Coast Guard publications, Navy Stock List, NavSandA 2002, Section VIII, to identify and order technical publications, directives and manuals. . . . . E-6 - -
- .61 Maintain current shop files of applicable technical publications, directives and manuals. . . . . E-6 - -
- .62 Identify and order powerplant parts, tools, equipment and material; maintain inventory records. . . . . E-6 - -
- .63 Maintain records of usage data. . . . . E-6 - -
- .80 Prepare tool, equipment and material evaluation reports . . . . . E-7 - -
- .81 Interpret and apply engine and accessory change bulletins and technical directives. . . . . E-7 - -
- .82 Plan, organize, lay out and supervise a powerplant shop; schedule workload . . . . . E-7 - -
- .83 Supervise inspection procedures to ensure that applicable technical specifications and standards of workmanship are met . . . . . E-7 - -
- .84 Make recommendations for and prepare rough draft or local maintenance instructions relative to powerplant maintenance and operation . . . . . E-7 - -

2.00 Examination Factors

- .01 General knowledge of Coast Guard Aviation organization and SAR operational plans . . . . . E-4 E-4 E-4
- .02 Types of information contained in periodic checklists and serial, standing, and aircraft work orders. . . . . E-4 E-4 E-4
- .40 Types of information contained in Unsatisfactory Reports of defective aircraft equipment . . . . . E-5 E-5 E-5
- .60 Interpret and apply Airplane or Helicopter Changes and Bulletins; Aviation Technical Orders and Notes (ATO's) and (ATN's) . . . . . E-6 - -
- .61 Standard organization and maintenance procedures of Air Stations and Air Detachments. . . . . E-6 - -

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AD ADJ ADR

G. ADMINISTRATION - Continued

2.00 Examination Factors - Continued

.62	Organization and functions of the aviation supply system . . . . .	E-6	-	-
.63	Types of information to be recorded in each section of the Aircraft Log Book, Aeronautical Equipment Service Record, and historical records . . . . .	E-6	-	-
.64	Types of information contained in aeronautical materials and equipment publications pertaining to aeronautical materials and equipment . . . . .	E-6	-	-
.80	Procedures for requesting manufacture and open purchase of aircraft equipment . . . . .	E-7	-	-
.81	Procedures for turning in and surveying aircraft equipment . . . . .	E-7	-	-
.82	Use of applicable allowance lists, parts catalogs, and forms in the requisitioning, inventorying, and accounting for aviation materials and equipment . . . . .	E-7	-	-
.83	Purposes and procedures for man-hour accounting . . . . .	E-7	-	-

★ SENIOR CHIEF AVIATION MACHINIST'S MATE (ADCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AD

1.00 Practical Factors

.90	Plan a program of safety instruction and inspection pertaining to aircraft power plants, related equipment, and assigned work centers . .	E-8		
.91	Recommend changes in methods and techniques to promote maximum ground safety, safety of flight, and operational readiness of aircraft . . . . .	E-8		
.92	Interpret information contained in technical publications pertaining to aircraft power plants and related systems . . . . .	E-8		
.93	Interpret maintenance instructions and directives to identify those applicable to power plants and related equipment and convert into maintenance documents or orders . . . . .	E-8		
.94	Ensure that established procedures are observed for conducting ground tests and for preflight, special, and periodic inspections to maintain desired quality level . . . . .	E-8		
.941	Evaluate requirements and submit requests for technical assistance from contractor representatives . . . . .	E-8		
.942	Review material allowance lists for adequacy and make recommendations for changes as necessary . . . . .	E-8		
.943	Draft letters, instructions, notices, and messages applicable to aircraft maintenance activities . . . . .	E-8		

2.00 Examination Factors

.90	Capabilities, limitations, and reliability of aircraft power plants and related systems . . . . .	E-8		
.91	Principles and procedures for casualty analysis of aircraft power plants and related systems . . . . .	E-8		

SENIOR CHIEF AVIATION MACHINIST'S MATE (ADCS) - Continued

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AD

2.00 Examination Factors - Continued

- .92 Fundamental concepts, objectives, and functions of quality control. . . E-8
- .94 Procedures and practices employed in overhaul and rework of air-  
craft power plants and accessories . . . . . E-8

★ MASTER CHIEF AVIATION MACHINIST'S MATE (ADCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Formulate guidelines to be used in safety inspections and instruc-  
tions concerning potentially hazardous conditions and practices . . . . E-9
- .96 Review and evaluate completed inspection records, quality control  
reports, and flight records to ensure that proper maintenance  
procedures are followed . . . . . E-9
- .97 Assist in statistical analyses of aircraft accident reports to  
determine causes . . . . . E-9
- .98 Plan, schedule, and coordinate workload among maintenance sections  
to ensure maximum operational readiness . . . . . E-9
- .99 Establish and implement a program for examining, interviewing,  
evaluating, and assigning personnel to ensure maximum utilization . . . E-9
- .991 Plan and forecast workload commitments for aircraft maintenance  
in order to meet operational requirements . . . . . E-9
- .992 Monitor implementation of preventive maintenance procedures to  
ensure that current directives are being enforced . . . . . E-9

2.00 Examination Factors

- .95 Methods and procedures for preparing and submitting aircraft  
maintenance problems and staff type studies . . . . . E-9
- .96 General procedures for aircraft and component inventory, requisition,  
receipt, transfer, and survey . . . . . E-9



#3

*Service Rating*  
~~GENERAL RATING~~

AVIATION ORDNANCEMAN (AO)

SCOPE

Aviation Ordnancemen maintain, repair, install, operate, service and handle small arms and aviation ordnance and armament equipment, including JATO. Operate and perform routine servicing and checking of aircraft external stores and JATO circuits. Stow, maintain, service, handle, install and remove aviation munitions and pyrotechnics; maintain and operate a small arms range. Instruct personnel in use of aviation ordnance equipment, aviation munitions, pyrotechnics, parachutes, aviation survival equipment and air-sea rescue equipment carried by aircraft. When required, service, maintain and repair aviation survival equipment and flight clothing. Supervise operation of aviation ordnance shops.

NOTE: Practical Factors for the Aviation Ordnanceman rating are applicable to the aircraft or equipment assigned or available.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AO

A. SAFETY

1.00 Practical Factors

- .39 Observe safety precautions in the:
  - a. Handling, servicing and line maintenance of aircraft and the use of related tools and equipment . . . . . E-4
  - b. Handling, stowing and loading of aviation munitions, and when handling JATO . . . . . E-4
  - c. Handling, operation and cleaning of small arms and pyrotechnic equipment . . . . . E-4
  - d. Assembly of explosive components of aviation munitions . . . . . E-5
- .80 Inspect and supervise assembly, arming and dearming areas for potentially hazardous and unsafe conditions and take appropriate corrective action . . . . . E-7
- .81 Organize and administer a program of safety instruction . . . . . E-7

2.00 Examination Factors

- .01 Safety precautions to be observed when working on the line and in the hangar or shop and while in flight (except those applicable exclusively to the control of an aircraft). . . . . E-4
- .02 Safety precautions applicable to aviation personnel to be observed in handling fuels and compressed gases . . . . . E-4
- .03 Safety regulations and precautions pertaining to the operation of the aviation survival shop, pyrotechnics, small arms including ammunition, and JATO . . . . . E-4

B. AIRCRAFT ARMAMENT INSPECTION AND MAINTENANCE

1.00 Practical Factors

- .01 Perform daily and preflight inspections of aircraft armament equipment . . . . . E-4
- .02 Select, use and care for common handtools . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AO

B. AIRCRAFT ARMAMENT INSPECTION AND MAINTENANCE - Continued

- 1.00 Practical Factors - Continued
  - .40 Make entries on performance records and equipment logs . . . . . E-5
  - .41 Perform intermediate and major inspections of aircraft armament equipment . . . . . E-5
  - .60 Inspect installation and check operation of repaired or newly installed parts and components . . . . . E-6
  - .80 Analyze reports of discrepancies and malfunctions and determine corrective action . . . . . E-7
  - .81 Review and evaluate completed inspection forms, work orders and failure and discrepancy reports . . . . . E-7
- 2.00 Examination Factors
  - .01 Types and uses of lubricants, cleaning solutions and preservatives commonly used on aircraft armament and aviation ordnance equipment . . . . . E-4
  - .02 Types and characteristics of corrosion encountered on aircraft armament and aviation ordnance equipment . . . . . E-4
  - .03 Use of Coast Guard and BuWeps publications relating to the inspection, servicing and maintenance of aircraft armament equipment . . . . . E-4
  - .80 Repair procedures and local practices as related to aviation ordnance and armament equipment . . . . . E-7
  - .81 Procedures and maintenance techniques applicable to servicing, assembling, installing and modifying aviation ordnance and armament equipment . . . . . E-7

C. SURVIVAL EQUIPMENT

- 1.00 Practical Factors
  - .01 Equip, inspect, stow and pack all types of standard aviation protective clothing and survival equipment . . . . . E-4
  - .02 Demonstrate knowledge of procedures for making emergency parachute jumps and for use of all survival equipment under emergency conditions . . . . . E-4
  - .03 Make authorized changes and repairs to flight clothing and personnel protective and survival equipment . . . . . E-4
  - .40 Instruct personnel in the use of parachutes and aviation survival equipment . . . . . E-5
  - .60 Prepare complete and accurate records and reports of the inspection, testing and packing of aviation survival equipment as required by current directives . . . . . E-6
- 2.00 Examination Factors
  - .01 Techniques of packing, inspecting and handling aviation survival equipment, including protective clothing and special equipment kits . . . . . E-4
  - .02 Methods of use of standard aviation survival equipment under emergency conditions . . . . . E-4
  - .03 Tensile strength, durability and other properties and general characteristics of fabrics currently used in aviation survival equipment . . . . . E-4
  - .04 Standard procedures used in repair of aviation survival equipment . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AO

D. AIRCRAFT GUN SYSTEMS

1.00 Practical Factors

None.

2.00 Examination Factors

- .01 Types, nomenclature and operating principles of aircraft guns, non-computing gunsights and gun system components . . . . . E-4
- .02 Types and markings of aircraft gun ammunition and containers. . . E-4
- .40 Types and nomenclature of test equipment used to maintain aircraft guns and gun systems . . . . . E-5

E. AIRCRAFT STORES AND RELATED EQUIPMENT

1.00 Practical Factors

- .01 Install fins, bands and other inert components on pyrotechnics and load on aircraft . . . . . E-4
- .02 Clean and lubricate bomb racks and shackles . . . . . E-4
- .03 Clean and test release and arming units . . . . . E-4
- .40 Test circuits and replace components of release and arming systems . . . . . E-5
- .41 Install, adjust and test bomb racks and shackles . . . . . E-5
- .42 Perform stray voltage tests and final pre-takeoff arming checks . E-5
- .60 Troubleshoot release and arming systems . . . . . E-6
- .80 Supervise the installation and removal of armament suspension, release and arming equipment to meet configuration requirements . . . . . E-7

2.00 Examination Factors

- .01 Types, nomenclature and capacity of slings, bands, hoists and associated armament loading equipment . . . . . E-4
- .02 Types and nomenclature of suspension, release and arming equipment . . . . . E-4
- .40 Operating principles of racks, shackles, ejectors, launchers, and release and arming systems . . . . . E-5
- .41 General characteristics, procedures for mixing and fusing of NAPALM . . . . . E-5
- .42 Procedures for installing and arming JATO . . . . . E-5
- .60 Procedures for loading external fuel tanks, chaff dispensers, communication navigation packages, and other similar supplementary stores mounted on armament stations. (Note: Connection and checkage of the store after loading is the responsibility of the rating which maintains the store.) . . . . . E-6
- .61 Procedures for loading aerial mines and torpedoes, special weapons and guided missiles, including attachment of static lines and arming wires. . . . . E-6
- .62 Types and characteristics of air-launched guided missiles . . . . E-6

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
AO

**F. AVIATION MUNITIONS STORAGE FACILITIES**

**1.00 Practical Factors**

- .01 Perform daily inspections of magazines, ready lockers and storage facilities, and record temperatures . . . . . E-4
- .02 Stow and handle munitions. ("Munitions" includes gun and small arms ammunition, pyrotechnics, fuses, detonators and actuating cartridges.) . . . . . E-4
- .40 Inspect magazines, ready lockers and storage facilities for munitions deterioration and proper storage . . . . . E-5
- .60 Supervise stowage and handling of munitions . . . . . E-6
- .61 Inspect and prepare munitions and inert components for shipment and transfer . . . . . E-6
- .80 Supervise receipt and issue of munitions . . . . . E-7

**2.00 Examination Factors**

- .01 Types, identification and general characteristics of munitions. . . . . E-4
- .02 Types, uses and care of munitions handling equipment . . . . . E-4
- .40 Types and characteristics of munitions deterioration . . . . . E-5
- .60 Specifications for munitions storage . . . . . E-6

**G. SMALL ARMS**

**1.00 Practical Factors**

- .01 Disassemble, clean, preserve and replace parts of small arms. (Note: "Small arms" includes rifles, pistols and similar weapons.) . . . . . E-4
- .40 Instruct in the use and handling of small arms . . . . . E-5
- .60 Issue, receive and maintain custody of small arms . . . . . E-6
- .80 Supervise small arms range firing practice . . . . . E-7

**2.00 Examination Factors**

- .01 Types, nomenclature and operating principles of small arms . . . . . E-4

**H. THEORY AND PRINCIPLES**

**1.00 Practical Factors**

None.

**2.00 Examination Factors**

- .01 Elementary physics of heat, fluids, gases and electricity . . . . . E-4
- .02 Meaning of electrical terms and units of measure . . . . . E-4
- .03 Theory of a.c. and d.c. electricity, and principles of magnetism . . . . . E-4
- .04 Principles of basic machines . . . . . E-4
- .05 Theory and operating principles of basic electrical measuring instruments . . . . . E-4
- .40 Principles of electronic tubes, semiconductors and associated circuits . . . . . E-5
- .60 Theory and principles of:
  - a. Free and rate gyroscopes . . . . . E-6
  - b. Linear and angular accelerometers . . . . . E-6
  - c. Servosystems . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AO

I. TEST EQUIPMENT, DRAWINGS AND SCHEMATICS

1.00 Practical Factors

- .01 Make voltage and resistance measurements; check for continuity, short circuits and grounds . . . . . E-4
- .40 Interpret aircraft schematic diagrams, drawings and charts . . . . . E-5
- .60 Use drawings, schematics and blueprints to troubleshoot, install and modify aircraft equipment. . . . . E-6
- .80 Analyze test equipment defects and initiate corrective action. . . . . E-7

2.00 Examination Factors

- .40 Types and nomenclature of test equipment used to maintain aircraft guns and gun systems . . . . . E-5
- .60 Procedures for obtaining repair and calibration of test equipment. . . . . E-6

J. ADMINISTRATION

1.00 Practical Factors

- .01 Know purpose of inspection forms, work orders, unsatisfactory reports and other related maintenance forms. . . . . E-4
- .40 Make entries in inspection forms, work orders and Unsatisfactory Reports (UR) . . . . . E-5
- .41 Be familiar with weight and balance procedures . . . . . E-5
- .60 Use Coast Guard publications; Navy Stock List, Nav SandA 2002, Section VIII, to identify and order technical publications, directives and manuals . . . . . E-6
- .61 Maintain current shop files, logs, publications, records and instructions E-6
- .62 Requisition, inventory and account for allowed tools and materials . . . . . E-6
- .80 Prepare aviation ordnance equipment and munitions reports. . . . . E-7
- .81 Interpret and apply information contained in applicable publications and instructions for handling, storage, issue, maintenance and operation of aviation ordnance equipment and munitions. . . . . E-7
- .82 Instruct personnel in assembly, loading and maintenance procedures and techniques applicable to aviation ordnance and munitions, and maintain quality control of work performed. . . . . E-7
- .83 Plan, organize and supervise aviation ordnance shops and armories. . . . . E-7

2.00 Examination Factors

- .01 General knowledge of Coast Guard aviation organization and SAR operation plans. . . . . E-4
- .02 Types of information contained in periodic checklists, serial, standing and aircraft work orders . . . . . E-4
- .40 Types of information contained in Unsatisfactory Reports of defective ordnance and survival equipment. . . . . E-5
- .60 Interpret and apply Airplane or Helicopter Changes and Bulletins; Aviation Technical Orders and Notes (ATO's and ATN's) as applicable to rating . . . . . E-6
- .61 Standard organization and maintenance procedures of air stations and air detachments. . . . . E-6
- .63 Types of information to be recorded in each section of the Aircraft Log Book and Aeronautical Equipment Service Record . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AO

J. ADMINISTRATION - Continued

2.00 Examination Factors - Continued

.62	Organization and functions of the Aviation Supply System . . . . .	E-6
.64	Types of information contained in aeronautical materials and equipment publications pertaining to aeronautical materials and equipment pertinent to rating. . . . .	E-6
.80	Procedures for requesting manufacture and open-purchase of equipment common to the AO rating. . . . .	E-7
.81	Procedures for turning in and surveying aeronautical materials and equipment applicable to rating . . . . .	E-7
.82	Use of applicable allowance lists, parts catalogs and forms in the requisitioning, inventorying and accounting for ordnance materials and survival equipment . . . . .	E-7
.83	Purposes and procedures for man-hour accounting. . . . .	E-7
.84	Train and supervise personnel in proper handling and maintenance of survival equipment, pyrotechnics, small arms, including ammunition, and JATO . . . . .	E-7

★ SENIOR CHIEF AVIATION ORDNANCEMAN (AOCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AO

1.00 Practical Factors

- .90 Plan a program of safety instruction and inspection pertaining to safety and survival equipment and assigned work areas . . . . . E-8
- .91 Collect and disseminate technical information concerning assigned equipment; direct attention to, and ensure compliance with, directives, publications, and instructions . . . . . E-8
- .92 Plan, organize, and supervise the functions of a safety and survival department . . . . . E-8
- .93 Coordinate functions between aviators' equipment division and other sub-sections within the maintenance sections . . . . . E-8
- .94 Interpret maintenance instructions and directives to identify those applicable to safety, survival, and related equipment and convert into maintenance documents or orders . . . . . E-8
- .941 Ensure that established procedures are observed for conducting ground tests and for special and periodic inspections to maintain desired quality control . . . . . E-8
- .942 Review material allowance lists for adequacy and make recommendations for change . . . . . E-8
- .943 Recommend changes in methods and techniques to promote maximum ground safety, safety of flight, and operational readiness of aircraft . . . . . E-8
- .944 Draft letters, instructions, notices, and messages applicable to aircraft maintenance activities . . . . . E-8

2.00 Examination Factors

- .90 Capabilities, limitations, and reliability of safety and survival equipment . . . . . E-8
- .91 Material control practices and supply management policies employed in support of the Coast Guard Maintenance Program . . . . . E-8
- .92 Methods for requisition, inventory, conservation, disposition, and survey of aviation ordnance material . . . . . E-8
- .93 Operation and maintenance of the ammunition and pyrotechnics stock reporting system . . . . . E-8
- .94 Regulations governing classification, preparation, safeguarding, and declassification of classified material . . . . . E-8

★ MASTER CHIEF AVIATION ORDNANCEMAN (AOCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Formulate guidelines to be used in safety inspections and instructions concerning potentially hazardous conditions and practices . . . . . E-9
- .96 Review and evaluate completed inspection records, quality control reports to ensure proper maintenance procedures are being followed. . . . . E-9

MASTER CHIEF AVIATION ORDNANCEMAN (AOCM) - Continued

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AO

1.00 Practical Factors - Continued

- .97 Review and evaluate aviation ordnance equipment safety requirements and initiate recommendations for improvement . . . . . E-9
- .98 Plan, implement, and prepare report material for an evaluation program of new equipment or material . . . . . E-9
- .99 Establish and implement a program for examining, interviewing, evaluating, and assigning personnel to ensure maximum utilization . . . E-9
- .991 Monitor implementation of preventive maintenance procedures to ensure current directives are being enforced . . . . . E-9

2.00 Examination Factors

- .95 Methods and procedures for preparing and submitting survival equipment maintenance problems and staff type studies . . . . . E-9
- .96 General procedures for aircraft and component inventory, requisition, receipt, transfer, and survey . . . . . E-9



AVIATION STOREKEEPER (AK)

SERVICE RATING (PO3 and PO2)

SCOPE

Aviation Storekeepers receive, identify, store, and issue aviation supplies, spare parts, and stocks of technical aviation items; confirm shipments and make reports of excesses, shortages, or damages; classify and stow materials, using the required protective measures; pack, tag, and inspect equipment and parts; and make inventories; prepare and maintain records pertaining to stock control and issuance of aviation equipment and materials.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AK

A. AVIATION SUPPLY ADMINISTRATION

1.00 Practical Factors

- .01 Operate adding, calculating, duplicating machines, and typewriters . . . . . E-4
- .02 Maintain requisition logs and files . . . . . E-4
- .03 Prepare routine correspondence in accordance with current instructions . . . . . E-4
- .04 Routine maintenance (oiling, cleaning, making minor adjustments) on typewriter, adding machine, and calculating machine . . . . . E-4
- .39 Typewrite for 5 minutes at minimum speed indicated below:  
(See Performance Test Instructions)
- a. At 20 words per minute . . . . . E-4
- b. At 30 words per minute . . . . . E-5
- .40 Compute cube and weight of aviation material and equipment . . . . . E-5

2.00 Examination Factors

- .01 Functions and typical organization of aviation supply activities afloat and ashore . . . . . E-4
- .02 Titles, symbols, and purposes of frequently used appropriations and funds; functional account numbers . . . . . E-4
- .03 Forms, routing, and filing of official correspondence . . . . . E-4
- .04 Regulations pertaining to handling of keys and combination locks to supply department spaces . . . . . E-4
- .05 Penalties imposed by law for unauthorized issue of equipment . . . . . E-4
- .40 Methods of procuring supplies and equipment and related source codes, including materials for aircraft on extended flights . . . . . E-5

B. PUBLICATIONS AND CATALOGS

1.00 Practical Factors

- .01 Use allowance lists and initial outfitting lists in procuring aviation equipment and supplies . . . . . E-4
- .02 Use appropriate publications and catalogs in identifying aviation material . . . . . E-4
- .40 Conduct an aircraft inventory, including flight operational equipment; complete inventory logs and records . . . . . E-5
- .41 Maintain current files of applicable publications, directives, manuals and catalogs . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AK

B. PUBLICATIONS AND CATALOGS - Continued

2.00 Examination Factors

- .01 Federal supply groups; construction of federal stock and local stock numbers and related codes . . . . . E-4
- .02 Types and purposes of failed, unsatisfactory, or removal (FUR) reports . . . . . E-4
- .40 General content of principal publications, directives, and bulletins used in the supply system . . . . . E-5
- .41 Procedures for obtaining forms and publications applicable to aviation units . . . . . E-5

C. AVIATION MATERIAL RECEIPT, STOWAGE, AND ISSUE

1.00 Practical Factors

- .01 Observe safety precautions in handling and stowage of aviation material, including flammables . . . . . E-4
- .02 Receive, verify, and acknowledge receipt of aviation material . . . . . E-4
- .03 Identify and stow aeronautical material . . . . . E-4
- .04 Issue aeronautical material . . . . . E-4
- .05 Prepare receipt and expenditure papers . . . . . E-4
- .06 Make entries on stock records and ledgers . . . . . E-4
- .07 Operate a common type forklift . . . . . E-4
- .40 Maintain records and equipage inventories . . . . . E-5
- .41 Determine disposition of incoming stores . . . . . E-5
- .42 Assemble cargo for shipment . . . . . E-5
- .43 Make entries in financial ledgers . . . . . E-5

2.00 Examination Factors

- .01 Types and uses of material handling equipment . . . . . E-4
- .02 Nomenclature, classification, and units of measure and/or issue of supplies and equipment . . . . . E-4
- .03 Types and uses of material issue, receipt, and shipping forms . . . . . E-4
- .04 Procedures for maintaining stock levels in an aviation ready issue store . . . . . E-4
- .05 Basic MILSTRIP procedures . . . . . E-4
- .40 Methods of preservation and packing aeronautical material for stowage and shipment . . . . . E-5
- .41 Procedures for stores inventories and adjusting losses and gains . . . . . E-5
- .42 Survey and other expenditure document procedures, including salvage, reclamation, exchange, and overage material . . . . . E-5

## AVIATION STRUCTURAL MECHANIC (AM)

### GENERAL RATING

#### SCOPE

Aviation Structural Mechanics maintain aircraft fuselages, wings, fixed and movable surfaces, airfoils, empennages, controls and mechanisms; remove, install and rig flight control surfaces; fabricate and assemble metal parts and make minor repairs to aircraft skin; install rivets and metal fasteners; paint; perform non-destructive testing inspections using dye penetrant, zyglo, magnaflux, etc.; maintain hydraulic systems including main and auxiliary power systems and unit actuating subsystems, landing gear, wheels and tires, brakes, related pneumatic systems including reservoir pressurization and emergency actuating systems, air conditioning, heating, pressurization, ventilating, other utility systems and associated pumps, valves, regulators, actuating cylinders, lines and fittings; service pressure accumulators, emergency air bottles, oleo struts, and reservoirs; inspect, remove and replace components of hydraulic systems; bleed hydraulic systems; adjust brakes and replace linings and pucks; replace gaskets, packing and wipers in hydraulic components; maintain safety belts, shoulder harnesses, inertia reels (installed in aircraft), fire extinguishing systems (excluding fire detection systems), portable fire extinguishers; replenish anti-icing and utility systems; and supervise operation of airframe shops.

NOTE: Practical Factors for the Aviation Structural Mechanic rating are applicable to the aircraft and equipment assigned or available.

#### SERVICE RATINGS (P03, P02)

#### SCOPES

##### AVIATION STRUCTURAL MECHANIC E (Safety Equipment) - AME

Aviation Structural Mechanics (E) maintain safety belts, shoulder harnesses, inertia reels, oxygen systems; fire extinguishing systems (excluding fire detection systems), portable fire extinguishers; ventilating and other utility systems and associated lines, fittings, valves and controls; replenish oxygen systems and anti-icing systems; and perform periodic inspections of components for which responsible.

##### AVIATION STRUCTURAL MECHANIC H (Hydraulics) - AMH

Aviation Structural Mechanics (H) maintain hydraulic systems, including main and auxiliary systems, and actuating subsystems, landing gear (excluding wheels and tires), brakes; pneumatic systems: pumps, valves, regulators, lines and fittings, accumulators, oleo struts; remove, repair and replace hydraulic and pneumatic system components; and perform periodic inspections of components for which responsible.

##### AVIATION STRUCTURAL MECHANIC S (Structures) - AMS

Aviation Structural Mechanics (S) maintain aircraft fuselages, wings (fixed and rotary), control surfaces, empennages, seats, wheels and tires; install and rig flight control surfaces; fabricate and assemble metal parts and make minor repairs to aircraft skin; install rivets and metal fasteners; build up wheels and tires; paint; perform periodic inspections of components for which responsible.

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
AM AME AMH AMS

**A. SAFETY**

**1.00 Practical Factors**

.01	Observe safety precautions in handling, servicing and line maintenance of aircraft and in the use of related tools, equipment and material . . . . .	E-4	E-4	E-4	E-4
.02	Observe safety precautions applicable to:				
	a. Aviation structural work, particularly those related to metalwork, power tools, compressed air, paint and solvents, and tire and wheel buildup . . . . .	E-4	-	-	E-4
	b. Aviation hydraulic work, particularly those relating to fluids under pressure, compressed gases, strut inflation, and aircraft jacking . . . . .	E-4	-	E-4	-
	c. Aviation safety equipment work, particularly those relating to liquid and gaseous oxygen, carbon dioxide, and fire extinguishing chemicals. . . . .	E-4	E-4	-	-
.80	Inspect work areas, tools, and equipment to detect potentially hazardous and unsafe conditions and take appropriate corrective action . . . . .	E-7	-	-	-
.81	Organize and administer a program of safety instruction applicable to aviation structural mechanic equipment and facilities . . . . .	E-7	-	-	-

**2.00 Examination Factors**

.01	Safety precautions to be observed when working on the line and in the hangar or shop and while in flight (except those applicable exclusively to the control of an aircraft) . . . .	E-4	E-4	E-4	E-4
.02	Safety precautions applicable to aviation personnel to be observed in handling fuels and compressed gases . . . . .	E-4	E-4	E-4	E-4
.03	Emergency procedures and use of standard aviation survival equipment under emergency conditions . . . . .	E-4	E-4	E-4	E-4

**B. AIRCRAFT INSPECTION AND MAINTENANCE**

**1.00 Practical Factors**

.01	Service aircraft on the line . . . . .	E-4	E-4	E-4	E-4
.02	Perform aircraft daily and preflight inspections . . . . .	E-4	E-4	E-4	E-4
.03	Select, use and care for common handtools . . . . .	E-4	E-4	E-4	E-4
.04	Remove and install safety belts, shoulder harnesses, and inertia reels. (NOTE: Safety belts and shoulder harnesses are proof load tested by personnel in the PR rating.) . . . .	E-4	E-4	-	-
.40	Make entries in accessory record cards . . . . .	E-5	E-5	E-5	E-5
.41	Perform intermediate and major aircraft inspections . . . . .	E-5	E-5	E-5	E-5
.60	Supervise and direct aircraft inspections . . . . .	E-6	-	-	-
.61	Maintain logs and records and prepare reports required by aircraft maintenance system . . . . .	E-6	-	-	-
.62	Inspect installation and evaluate operation of repaired or newly installed parts and components . . . . .	E-6	-	-	-
.80	Analyze reports of discrepancies and malfunctions and determine corrective action . . . . .	E-7	-	-	-
.81	Review and evaluate completed inspection forms, work orders, and failure and discrepancy reports . . . . .	E-7	-	-	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AM AME AMH AMS

B. AIRCRAFT INSPECTION AND MAINTENANCE

2.00 Examination Factors - Continued

.01	Procedures and portable equipment used to extinguish fires during starting and stopping of aircraft engines . . . . .	E-4	E-4	E-4	E-4
.02	Types and designations of fuel, oil, hydraulic fluid, and lubricants used in aircraft . . . . .	E-4	E-4	E-4	E-4
.03	Types and characteristics of corrosion . . . . .	E-4	E-4	E-4	E-4
.04	Use of publications relating to inspection, servicing, and maintenance of aircraft, particularly handbooks of inspection requirements, maintenance instructions, service and operating instructions, and parts lists and catalogs . . . . .	E-4	E-4	E-4	E-4
.40	Types and application of corrosion prevention and preservation materials . . . . .	E-5	E-5	E-5	E-5
.41	Types, uses, and care of aircraft groundhandling equipment . . . . .	E-5	E-5	E-5	E-5
.60	Procedures for inventory of aircraft . . . . .	E-6	-	-	-
.80	Procedures for hoisting aircraft . . . . .	E-7	-	-	-

C. AIRFRAME AND FLIGHT CONTROL RIGGING AND ALIGNMENT

1.00 Practical Factors

.40	Remove and install flight control surfaces . . . . .	E-5	-	E-5	E-5
.41	Adjust and replace hydraulic and pneumatic components of flight control systems . . . . .	E-5	-	E-5	-
.42	Measure and adjust control surface travel, tab positioning, mechanical linkages, and cable tensions . . . . .	E-5	-	-	E-5
.60	Remove and install wings, wing panels, and stabilizers . . . . .	E-6	-	-	-
.80	Analyze malfunctions of flight control systems and determine corrective action . . . . .	E-7	-	-	-
.81	Diagnose aircraft irregular flight characteristics and overstressing and determine corrective action . . . . .	E-7	-	-	-

2.00 Examination Factors

.01	Types and characteristics of airframes and flight controls . . . . .	E-4	-	E-4	E-4
.40	Operating principles of flight control surfaces and systems . . . . .	E-5	-	E-5	E-5
.41	Procedures for balancing flight control surfaces . . . . .	E-5	-	-	E-5
.42	Basic helicopter theory of flight and operating principles of rotor blades and rotor heads. (NOTE: The AD rating is responsible for maintenance of drive shafting, power transmissions, gear boxes, and clutch assemblies on helicopters.) . . . . .	E-5	-	E-5	E-5
.60	Effects of misalignment of airframes and flight controls on aircraft flight characteristics . . . . .	E-6	-	-	-
.80	Procedures for rigging and aligning airframes . . . . .	E-7	-	-	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AM AME AMH AMS

D. METALS

1.00	Practical Factors				
.01	Fabricate, test, and fit rigid tubing and flexible hose assemblies. . . . .	E-4	E-4	E-4	E-4
.02	Replace common rivets and metal fasteners. . . . .	E-4	-	-	E-4
.03	Install lap and flush patches on nonstressed skin. . . . .	E-4	-	-	E-4
.40	Replace riveted and bolted fittings and brackets in aircraft structural components. . . . .	E-5	-	-	E-5
.41	Repair stressed skin . . . . .	E-5	-	-	E-5
.42	Perform dye penetrant and zyglu inspections. . . . .	E-5	E-5	E-5	E-5
.60	Perform oxyacetylene and electric arc welding; braze and silver solder metal. . . . .	E-6	-	-	-
.61	Fabricate metal parts and repair internal structural members, such as ribs, stringers, and bulkheads . . . . .	E-6	-	-	-
.62	Perform magnetic particle inspections. . . . .	E-6	E-6	E-6	E-6
.80	Determine repair procedures for aircraft structural damage . . . . .	E-7	-	-	-
.81	Interpret results of dye penetrant and magnetic particle inspections. . . . .	E-7	-	-	-
2.00	Examination Factors				
.01	Types and application of common rivets and metal fasteners . . . . .	E-4	-	-	E-4
.40	Types and application of special rivets and metal fasteners. . . . .	E-5	-	-	E-5
.41	Characteristics of metals used in airframes. . . . .	E-5	-	-	E-5
.60	Types and purposes of plating, anadizing, and heat treatment of metals used in aircraft structures. . . . .	E-6	-	-	-
.80	Methods of testing metals for hardness . . . . .	E-7	-	-	-
.81	Construction principles of aircraft airframes. . . . .	E-7	-	-	-

E. NONMETALLIC MATERIALS

1.00	Practical Factors				
.01	Operate paint spray gun. . . . .	E-4	-	-	E-4
.40	Replace panels in windshields, plastic enclosures, and windows. . . . .	E-5	-	-	E-5
.60	Repair breaks, cracks, and punctures in transparent and reinforced plastics. . . . .	E-6	-	-	-
.80	Repair leaks in integral fuel tanks. (NOTE: Inspection and maintenance of aircraft fuel systems and inflight refueling packages, including removal and installation of fuel cells, are performed by personnel in the AD rating.) . . . . .	E-7	-	-	-
2.00	Examination Factors				
.60	Types and uses of aircraft paints. . . . .	E-6	-	-	-
.80	Procedures for repairing bladder fuel cells. (NOTE: Inspection and maintenance of aircraft fuel systems and inflight refueling packages, including removal and installation of fuel cells, are performed by personnel in the AD rating.) . . . . .	E-7	-	-	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AM AME AMH AMS

F. HYDRAULIC AND PNEUMATIC SYSTEMS

1.00 Practical Factors

.01	Remove and install check valves, relief valves, sequence valves, restrictors, actuating cylinders, and emergency air bottles . . . . .	E-4	-	E-4	-
.02	Locate external leaks in aircraft hydraulic systems . . . . .	E-4	-	E-4	-
.40	Adjust actuating cylinders, relief and sequence valve mechanisms, and pressure regulators . . . . .	E-5	-	E-5	-
.41	Replace gaskets, packings, and wipers in actuating cylinders, shuttle valves, and sequence valves . . . . .	E-5	-	E-5	-
.42	Bleed hydraulic main power, power boost, and actuating systems . . . . .	E-5	-	E-5	-
.43	Test aircraft hydraulic systems and components, using portable and stationary hydraulic test stands . . . . .	E-5	-	E-5	-
.44	Remove and install pumps, motors, pressure regulators, and recoil struts . . . . .	E-5	-	E-5	-
.60	Rig and adjust control and actuating mechanisms and linkages . . . . .	E-6	-	-	-
.80	Analyze aircraft hydraulic system malfunctions, isolate defective components, and determine corrective action. (NOTE: Personnel in the AE rating repair and replace electrical components.) . . . . .	E-7	-	-	-
.81	Establish a program for prevention of externally induced hydraulic system contamination . . . . .	E-7	-	-	-

2.00 Examination Factors

.01	Fundamentals of hydraulics . . . . .	E-4	E-4	E-4	E-4
.02	Operating principles of aircraft hydraulic systems and associated pneumatic systems . . . . .	E-4	E-4	E-4	-
.40	Operating principles of aircraft hydraulic system components . . . . .	E-5	-	E-5	-
.41	Characteristics and designations of gaskets, packings, and wipers used in hydraulic system components . . . . .	E-5	-	E-5	-
.42	Precautions to be observed in the use of portable and stationary hydraulic test stands to prevent contamination of aircraft hydraulic systems . . . . .	E-5	-	E-5	-
.60	Operation and interrelationships of components of hydraulic and pneumatic systems . . . . .	E-6	-	-	-
.80	Procedures for flushing hydraulic systems . . . . .	E-7	-	-	-

G. LANDING GEAR

1.00 Practical Factors

.01	Change aircraft wheel and tire assemblies; repack and replace wheel bearings . . . . .	E-4	-	E-4	E-4
.02	Build up wheels and tires . . . . .	E-4	-	-	E-4
.03	Measure and adjust brake clearances . . . . .	E-4	-	E-4	-
.04	Bleed brake systems . . . . .	E-4	-	E-4	-
.40	Replace brake assemblies, linings, pucks, discs, master cylinders, power brake valves, and emergency system components . . . . .	E-5	-	E-5	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AM AME AMH AMS

G. LANDING GEAR - Continued

1.00 Practical Factors - Continued

.41	Adjust landing gear controls, locks, doors, microswitches, and mechanical linkages. . . . .	E-5	-	E-5	-
.60	Rig and adjust nosewheel steering mechanisms . . . . .	E-6	-	-	-
.61	Supervise landing gear drop checks . . . . .	E-6	-	-	-
.80	Replace landing gear assemblies; disassemble landing gear struts and replace internal components . . . . .	E-7	-	-	-
.81	Determine repair procedures for damaged landing gear . . . . .	E-7	-	-	-

2.00 Examination Factors

.01	Limitations of tire wear and damage. . . . .	E-4	-	E-4	E-4
.02	Operating principles of landing gear systems . . . . .	E-4	-	E-4	-
.40	Operating principles of landing gear controls, control valves, shock struts, shimmy dampers, brakes, sequence valves, and emergency system components. . . . .	E-5	-	E-5	-
.60	Procedures for checking landing gear alignment . . . . .	E-6	-	-	-

H. AIR-CONDITIONING, PRESSURIZATION, AND UTILITY SYSTEMS

1.00 Practical Factors

.01	Replace components of air-conditioning and pressurization systems, visual improvement systems, and fixed fire extinguishing systems. . . . .	E-4	E-4	-	-
.40	Test cockpits and cabins for pressure tightness, leaks, proper pressure, and temperature control; repair striking surfaces and replace seals . . . . .	E-5	E-5	-	-
.41	Test for carbon monoxide contamination . . . . .	E-5	E-5	-	-
.42	Adjust temperature and pressure control units. . . . .	E-5	E-5	-	-
.43	Rig and adjust actuating controls and mechanisms . . . . .	E-5	E-5	-	-
.60	Replace defective indicators and controls. . . . .	E-6	-	-	-
.80	Analyze systems malfunctions, isolate defective components, and determine corrective action. (NOTE: Personnel in the AD rating maintain, remove, and install combustion type heaters, compressor bleed ducting located within the engine compartment, and engine gear boxes. Personnel in the AE rating maintain, remove, and install electrical components of air-conditioning, pressurization, and utility systems.) . . . . .	E-7	-	-	-

2.00 Examination Factors

.01	Operating principles of air-conditioning, pressurization, and utility systems. (NOTE: Carbon dioxide cylinders in fire extinguishing, liferaft ejection, and other utility systems are inspected, removed, and installed in aircraft by personnel in the AM rating and recharged by personnel in the PR rating.) . . . . .	E-4	E-4	-	-
.40	Operating principles of air-conditioning, pressurization, and utility systems components . . . . .	E-5	E-5	-	-
.41	Sources and limits of air contamination; procedures for correcting excessive contamination . . . . .	E-5	E-5	-	-



**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
AM AME AMH AMS

**I. DRAWINGS, SCHEMATICS AND BLUEPRINTS**

**1.00 Practical Factors**

.01	Use schematic diagrams, drawings and charts to trace systems. . . . .	E-4	E-4	E-4	E-4
.40	Use shop sketches and drawings to assemble and install aircraft equipment and parts. . . . .	E-5	E-5	E-5	E-5
.60	Use schematic diagrams, drawings and charts in trouble shooting and correcting material failures. . . . .	E-6	-	-	-
.61	Lay out patterns and templates for metal work. . . . .	E-6	-	-	-
.62	Read and interpret drawings and blueprints . . . . .	E-6	-	-	-

**2.00 Examination Factors**

.01	Types of information shown and meanings of mechanical and electrical symbols used in schematic and block diagrams of airframes and accessories. . . . .	E-4	E-4	E-4	E-4
.02	Color tape and symbol codes used in aircraft to designate and indicate fuel, oil, hydraulic and other liquid or gas lines. . . . .	E-4	E-4	E-4	E-4
.03	Types, characteristics, uses and identification markings of aircraft metals, tubing, rivets, bolts, etc . . . . .	E-4	E-4	E-4	E-4
.40	Types of information shown on blueprints of airframes and accessories. . . . .	E-5	E-5	E-5	E-5

**J. OPERATIONAL**

**1.00 Practical Factors**

.40	Be familiar with weight and balance procedures . . . . .	E-5	E-5	E-5	E-5
.60	If assigned to activities requiring flight mechanics, perform the following:				
a.	Follow proper engineering procedure and take necessary action in inspecting, testing and operating engine controls, and equipment on own aircraft before flight, during ground operations and all flight conditions . . . . .	E-6	-	-	-
b.	Set engine controls for various conditions in accordance with standard operating procedures . . . . .	E-6	-	-	-
c.	Recognize specific signs of malfunctioning of engines from observation of instruments and/or engine analyzer if installed, and when possible, make adjustments in flight. . . . .	E-6	-	-	-
d.	Have knowledge of aircraft performance charts. . . . .	E-6	-	-	-

**2.00 Examination Factors**

None.

**K. ADMINISTRATION**

.01	Know purpose of inspection forms, work orders, unsatisfactory reports, and other related maintenance forms . . . . .	E-4	E-4	E-4	E-4
.40	Make entries in inspection forms, work orders and unsatisfactory reports (UR) . . . . .	E-5	E-5	E-5	E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AM AME AMH AMS

K. ADMINISTRATION - Continued

1.00 Practical Factors - Continued

.60	Use Coast Guard publications; Navy Stock List, NavSandA 2002, Section VIII, to identify and order technical publications, directives and manuals . . . . .	E-6	-	-	-
.61	Maintain current shop files of applicable publications, directives and manuals . . . . .	E-6	-	-	-
.62	Identify and order aircraft parts, tools, equipment and material; maintain inventory records . . . . .	E-6	-	-	-
.80	Maintain records of usage data . . . . .	E-7	-	-	-
.81	Prepare tool, equipment and material evaluation reports. . . . .	E-7	-	-	-
.82	Plan, organize, lay out, and supervise airframe shops; schedule and assign workload . . . . .	E-7	-	-	-
.83	Supervise inspection procedures to ensure that applicable technical specifications and standards of workmanship are met. . . . .	E-7	-	-	-

2.00 Examination Factors

.01	General knowledge of Coast Guard aviation organization and SAR operational plans. . . . .	E-4	E-4	E-4	E-4
.02	Types of information contained in periodic checklists and serial, standing, and aircraft work orders . . . . .	E-4	E-4	E-4	E-4
.40	Types of information contained in Unsatisfactory Reports of defective aircraft equipment . . . . .	E-5	E-5	E-5	E-5
.60	Interpret and apply Airplane or Helicopter Changes and Bulletins; Aviation Technical Orders and Notes (ATO's and ATN's) . . . . .	E-6	-	-	-
.61	Standard organization and maintenance procedures of Air Station and Air Detachments. . . . .	E-6	-	-	-
.62	Organization and functions of the Aviation Supply System . . . . .	E-6	-	-	-
.63	Types of information to be recorded in each section of the Aircraft Log Book, Aeronautical Equipment Record, and Historical Records . . . . .	E-6	-	-	-
.64	Types of information contained in aeronautical materials and equipment publications pertaining to aeronautical materials and equipment. . . . .	E-6	-	-	-
.80	Procedures for requesting manufacture and open purchase of aircraft equipment. . . . .	E-7	-	-	-
.81	Procedures for turning in and surveying aircraft equipment . . . . .	E-7	-	-	-
.82	Use of applicable allowance lists, parts catalogs and forms in the requisitioning, inventorying and accounting for aviation materials and equipment . . . . .	E-7	-	-	-
.83	Purposes and procedures for man-hour accounting. . . . .	E-7	-	-	-

★ SENIOR CHIEF AVIATION STRUCTURAL MECHANIC (AMCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AM

1.00 Practical Factors

- .90 Plan a program of safety instruction and inspection pertaining to airframes, related equipment, and assigned work areas and shops. . . . . E-8
- .91 Recommend changes in methods and techniques to promote maximum ground safety, safety of flight, and operational readiness of aircraft . . . . . E-8
- .92 Interpret information contained in technical publications pertaining to rigging of airframes and flight controls; construction materials; hydraulic, pneumatic, and oxygen systems; and utility systems . . . . . E-8
- .93 Interpret maintenance instructions and directives to identify those applicable to airframes and associated equipment and convert into maintenance documents or orders . . . . . E-8
- .94 Establish and implement procedures for a continuous and effective corrosion control program . . . . . E-8
- .941 Evaluate requirements and submit requests for technical assistance from contractor representatives . . . . . E-8
- .942 Review material allowance lists for adequacy and make recommendations for changes as necessary . . . . . E-8
- .943 Draft letters, instructions, notices, and messages applicable to aircraft maintenance activities . . . . . E-8

2.00 Examination Factors

- .90 Procedures and practices employed in overhaul and rework of airframes, structural components, and related systems . . . . . E-8
- .91 Material control practices and supply management policies employed in support of the Aircraft Maintenance Program . . . . . E-8
- .92 Fundamental concepts, objectives, and functions of quality control . . . . . E-8
- .93 Regulations governing classification, preparation, safeguarding, and declassification of classified material . . . . . E-8

★ MASTER CHIEF AVIATION STRUCTURAL MECHANIC (AMCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Formulate guidelines to be used in safety inspections and instructions concerning potentially hazardous conditions and practices . . . . . E-9
- .96 Review and evaluate completed inspection records, quality control reports, and flight records to ensure that proper maintenance procedures are followed . . . . . E-9
- .97 Assist in statistical analyses of aircraft accident reports to determine causes . . . . . E-9
- .98 Plan, schedule, and coordinate workload among maintenance sections to ensure maximum operational readiness . . . . . E-9
- .99 Establish and implement a program for examining, interviewing, evaluating, and assigning personnel to ensure maximum utilization . . . . . E-9
- .991 Plan and forecast workload commitments for aircraft maintenance in order to meet operational requirements . . . . . E-9
- .992 Monitor implementation of preventive maintenance procedures to ensure that current directives are being enforced . . . . . E-9

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AM

2.00 Examination Factors

- .95 Methods and procedures for preparing and submitting aircraft maintenance problems and staff type studies . . . . . E-9
- .96 General procedures for aircraft and component inventory, requisition, receipt, transfer, and survey . . . . . E-9

AVIATION SURVIVALMAN (ASM)

GENERAL RATING

SCOPE

Aviation Survivalmen (ASM) inspect, maintain, and repair parachutes, survival equipment, flight protective clothing, and equipment; pack and rig parachutes; pack and equip life-rafts; fit and maintain oxygen masks, flight clothing, and anti-exposure suits; operate and repair sewing machines; maintain (shop test and repair) safety belts, shoulder harnesses, inertia reels; maintain oxygen equipment, portable fire extinguishers; replenish oxygen systems; stow, inspect, maintain, repair, install, operate, service, and handle small arms and aviation ordnance and pyrotechnic equipment, including JATO; operate and perform routine servicing and checking of aircraft external stores and JATO circuits; instruct personnel in use of parachutes, survival equipment, protective clothing, special equipment packets, oxygen-breathing equipment, and air-sea rescue equipment, and handling of pyrotechnics and JATO; supervise operation of survival equipment shops; perform and instruct first aid.

NOTE: Practical Factors for the Aviation Survivalman rating are applicable to the aircraft or equipment assigned or available.

SERVICE RATINGS

NONE.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ASM

A. SAFETY

1.00 Practical Factors

- .01 Observe safety precautions when working in survival shops, handling oxygen and carbon dioxide, and operating sewing machines . . . . . E-4
- .39 Observe safety precautions in the:
  - a. Handling, servicing, and line maintenance of aircraft and the use of related tools and equipment . . . . . E-4
  - b. Handling, stowing, and loading of aviation pyrotechnics, and when handling JATO . . . . . E-4
  - c. Handling, operating, and cleaning of small arms, and pyrotechnic equipment . . . . . E-4
  - d. Use, handling, and storage of flammable cements, solvents, and thinners . . . . . E-5
- .80 Inspect work areas, tools, and equipment to detect potentially hazardous and unsafe conditions and take appropriate action. . . E-7
- .81 Organize and administer a program of safety instruction . . . . E-7

2.00 Examination Factors

- .01 Safety precautions to be observed when working on the line and in the hangar or shop and while in flight (except those applicable exclusively to the control of an aircraft) . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ASM

A. SAFETY - Continued

2.00 Examination Factors - Continued

- .02 Safety precautions applicable to aviation personnel to be observed in handling fuels and compressed gases . . . . . E-4
- .03 Safety precautions and regulations pertaining to the operation of the aviation survival shop, pyrotechnics, small arms, including ammunition and JATO . . . . . E-4

B. PARACHUTES

1.00 Practical Factors

- .01 Unpack, wash, and dry parachutes . . . . . E-4
- .02 Inspect parachute material for stains and deterioration . . . . . E-4
- .03 Make minor repairs to parachutes and component parts . . . . . E-4
- .40 Instruct plane captains, pilots, and aircrewmembers in proper care, handling, and stowage of parachutes . . . . . E-5
- .60 Measure temperature and humidity in parachute dry lockers and storage rooms . . . . . E-6
- .80 Instruct in the procedures for parachute landings in high winds, trees, and water . . . . . E-7
- .81 Demonstrate aircraft emergency escape procedures and use of parachutes under simulated conditions . . . . . E-7

2.00 Examination Factors

- .01 General arrangement and facilities of parachute lofts . . . . . E-4
- .02 Types, component parts, construction, and operation of personnel parachutes . . . . . E-4
- .40 Procedures for removing stains from parachute material . . . . . E-5
- .41 Standard procedures used in repair of parachutes . . . . . E-5
- .60 Temperature and humidity limitations for parachute dry lockers and storage rooms . . . . . E-6
- .61 Identifying characteristics and proper treatment for various causes of stains in parachute material . . . . . E-6
- .80 Purposes and operating principles of cargo and other types of non-personnel parachutes . . . . . E-7

C. FABRIC WORK

1.00 Practical Factors

- .01 Hand sew, stitch, and tack material . . . . . E-4
- .02 Install and replace standard snap fasteners, grommets, slide fasteners, and speedy rivets . . . . . E-4
- .03 Inspect and proof load safety belts and shoulder harnesses removed from aircraft . . . . . E-4
- .04 Operate standard sewing machines . . . . . E-4
- .40 Repair slide fasteners . . . . . E-5
- .41 Lubricate sewing machines and make minor adjustments . . . . . E-5
- .42 Cold patch rubberized material . . . . . E-5
- .43 Make fabric assemblies . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ASM

C. FABRIC WORK - Continued

1.00 Practical Factors - Continued

- .60 Develop and layout patterns from drawings, blueprints, and photographs . . . . . E-6
- .61 Determine causes of sewing machine malfunctions; repair and replace parts . . . . . E-6

2.00 Examination Factors

- .01 Types and general characteristics of fabrics, tapes, webbings, fasteners, needles, thread, and other material used in fabric work . . E-4
- .02 Types and uses of seams and stitching patterns . . . . . E-4
- .03 Operating principles of standard sewing machines . . . . . E-4
- .40 Procedures for removing stains from fabric materials . . . . . E-5
- .60 Symbols and terms used on drawings and blueprints for fabric work . . . E-6
- .80 Specifications, characteristics, and uses of fabrics, tapes, webbings, thread, hardware, and other materials used in fabric work and allowable substitutes . . . . . E-7

D. FLIGHT AND PROTECTIVE CLOTHING AND EQUIPMENT

1.00 Practical Factors

- .01 Inspect and test lifevests and attached equipment . . . . . E-4
- .40 Repair flight clothing . . . . . E-5
- .41 Fit and repair anti-exposure suits . . . . . E-5
- .42 Fit and adjust helmets and liners; install earphones and microphones. (Earphones and microphones are maintained by personnel in the AT rating.) . . . . . E-5
- .60 Demonstrate use of flight and protective clothing and equipment under simulated conditions . . . . . E-6

2.00 Examination Factors

- .01 Techniques of packing, inspecting, and handling protective clothing and special equipment kits . . . . . E-4
- .40 Use and application of fire retardant compounds for flight clothing . . . . . E-5
- .41 Regulations governing changes and repairs to flight and protective clothing and equipment . . . . . E-5

E. SURVIVAL EQUIPMENT AND PYROTECHNICS

1.00 Practical Factors

- .01 Inspect, test, equip, and pack liferafts; replace carbon dioxide cylinders. (Liferaft ejection systems in aircraft are maintained by personnel in the AM rating.) . . . . . E-4
- .02 Operate carbon dioxide recharge equipment . . . . . E-4
- .03 Stow, handle, operate, and maintain aviation pyrotechnics and JATO . . . E-4

E. SURVIVAL EQUIPMENT AND PYROTECHNICS - Continued

1.00 Practical Factors - Continued

- .04 Equip, inspect, stow, and pack all types of standard aviation survival equipment . . . . . E-4
- .05 Make authorized changes and repairs to survival equipment . . . . . E-4
- .40 Patch holes and tears in liferafts . . . . . E-5
- .41 Demonstrate knowledge of procedures for use of all survival equipment under emergency conditions . . . . . E-5
- .60 Maintain carbon dioxide recharge equipment . . . . . E-6
- .61 Assemble, pack, and rig airdrop survival kits and containers . . . . . E-6
- .62 Prepare, pack, and ensure readiness of dropable pumps . . . . . E-6

2.00 Examination Factors

- .01 Types and uses of tools common to the rating . . . . . E-4
- .02 Types, construction, and operation of liferafts . . . . . E-4
- .03 Techniques of packing, inspecting, and handling aviation survival equipment . . . . . E-4
- .04 Standard procedures used in repair of aviation survival equipment . . . . . E-4
- .05 Procedures for maintaining pyrotechnics and JATO . . . . . E-4
- .40 Methods of use of standard aviation survival equipment under emergency conditions . . . . . E-5
- .41 Principles of operation of carbon dioxide cylinder components used in liferafts . . . . . E-5
- .60 Construction of various types of liftwebs and sling assemblies for use on cargo to be dropped with aerial delivery parachutes . . . . . E-6

F. AIRCRAFT STORES AND RELATED EQUIPMENT

1.00 Practical Factors

- .01 Install fins, bands, and other inert components on pyrotechnics and load on aircraft . . . . . E-4
- .40 Clean and lubricate bomb racks and shackles . . . . . E-5
- .41 Clean and test release and arming units . . . . . E-5
- .42 Test circuits and replace components of release and arming systems . . . . . E-5
- .43 Install, adjust, and test bomb racks and shackles . . . . . E-5
- .44 Install JATO units; perform stray voltage tests and final pretake-off arming checks . . . . . E-5
- .60 Troubleshoot release and arming systems . . . . . E-6
- .80 Supervise the installation and removal of external stores, JATO, and release and arming equipment to meet configuration requirements . . . . . E-7

2.00 Examination Factors

- .01 Types and nomenclature of suspension, release, and arming equipment . . . . . E-4
- .40 Operating principles of racks, shackles, release and arming systems . . . . . E-5
- .41 Procedures for installing and arming JATO . . . . . E-5
- .42 Procedures for loading external fuel tanks, and other similar supplementary stores mounted on armament stations. (Connection and check of the store after loading is the responsibility of the rating which maintains the store.) . . . . . E-5



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ASM

G. AVIATION ORDNANCE AND PYROTECHNIC STORAGE FACILITIES

1.00 Practical Factors

- .01 Perform daily inspections of magazines, ready lockers, and storage facilities and record temperatures . . . . . E-4
- .40 Stow and handle small arms ammunition, pyrotechnics, fuses, actuating cartridges, towing assembly explosive bolts, and guillotine firing heads . . . . . E-5
- .41 Inspect magazines, ready lockers, and storage facilities for deterioration and proper storage of contents . . . . . E-5
- .60 Supervise stowage and handling of ordnance equipment . . . . . E-6
- .61 Inspect and prepare ammunition, pyrotechnics, and inert components for shipment and transfer. . . . . E-6

2.00 Examination Factors

- .01 Types, identification, and general characteristics of small arms ammunition, pyrotechnics, fuses, detonators, actuating cartridges, towing assembly explosive bolts, and guillotine firing heads . . . . . E-4
- .02 Types, uses, and care of ordnance handling equipment . . . . . E-4
- .40 Types and characteristics of deterioration of pyrotechnics and small arms ammunition . . . . . E-5
- .60 Specifications for storage of ordnance and pyrotechnic materials . . . . . E-6

H. SMALL ARMS

1.00 Practical Factors

- .01 Disassemble, clean, preserve, and replace parts of small arms. ("Small arms" includes rifles, pistols, and similar weapons.) . . . . . E-4
- .40 Instruct in the use and handling of small arms . . . . . E-5
- .60 Issue, receive, and maintain custody of small arms . . . . . E-6
- .80 Supervise small arms range firing practice . . . . . E-7

2.00 Examination Factors

- .01 Types, nomenclature, and operating principles of small arms . . . . . E-4

I. THEORY AND PRINCIPLES

1.00 Practical Factors

None.

2.00 Examination Factors

- .01 Elementary physics of heat, fluids, gases, and electricity . . . . . E-4
- .02 Meaning of electrical terms and units of measure . . . . . E-4
- .03 Basic theory of a.c. and d.c. electricity and principles of magnetism . . . . . E-4
- .04 Principles of basic machines . . . . . E-4
- .05 Theory and operating principles of basic electrical measuring instruments . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ASM

J. TEST EQUIPMENT, DRAWINGS, AND SCHEMATICS

1.00 Practical Factors

- .01 Make voltage and resistance measurements; check for continuity, short circuits, and grounds . . . . . E-4
- .40 Interpret aircraft schematic diagrams, drawings, and charts . . . . . E-5
- .60 Use drawings, schematics, and blueprints to troubleshoot, install, and modify aircraft equipment . . . . . E-6
- .80 Analyze test equipment defects and initiate corrective action . . . . . E-7

2.00 Examination Factors

- .40 Types and nomenclature of test equipment used to maintain aircraft external stores release and JATO firing systems . . . . . E-5
- .60 Procedures for obtaining repair and calibration of test equipment . . . . . E-6

K. OXYGEN EQUIPMENT

1.00 Practical Factors

- .01 Service aircraft with oxygen, using oxygen transfer trailers or direct filling equipment; purge aircraft oxygen systems . . . . . E-4
- .02 Ground check oxygen systems for proper operation . . . . . E-4
- .03 Inspect and clean oxygen masks . . . . . E-4
- .04 Remove and replace components of oxygen mask assemblies . . . . . E-4
- .40 Remove and install aircraft oxygen system components . . . . . E-5
- .41 Maintain oxygen transfer trailers . . . . . E-5
- .60 Analyze system malfunctions, isolate defective components, and determine corrective action . . . . . E-6
- .61 Shop test, repair, or replace components as necessary . . . . . E-6
- .62 Fit and modify oxygen masks . . . . . E-6

2.00 Examination Factors

- .01 Operating principles of aircraft oxygen systems . . . . . E-4
- .40 Operating principles of oxygen system components . . . . . E-5
- .60 Procedures for testing oxygen systems . . . . . E-6
- .61 Types and operating principles of oxygen shop transfer and recharge equipment . . . . . E-6

L. FIRST AID

1.00 Practical Factors

- .01 Apply various types of bandages, dressings, and splints . . . . . E-4
- .40 Demonstrate cardio-pulmonary resuscitation . . . . . E-5
- .41 Demonstrate immobilization of all types of fractures in preparation for transportation . . . . . E-5
- .42 Transport injured without litter by approved hand or back-carry method . . . . . E-5
- .60 Operate RBA and OBA . . . . . E-6
- .61 Prepare lesson plans and conduct first aid instruction . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ASM

L. FIRST AID - Continued

2.00 Examination Factors

- .01 Definitions and rules for first aid to the injured . . . . . E-4
- .02 Types and uses of bandages and dressings . . . . . E-4
- .03 Types and uses of splints and other immobilization methods . . . . . E-4
- .40 First aid governing treatment for head, chest, and abdominal wounds . . . . . E-5
- .41 Types of litters and their use . . . . . E-5
- .42 First aid as the emergency treatment for:
  - a. Asphyxia, hemorrhage, shock, sprains, dislocations, fractures, and burns . . . . . E-5
  - b. Unconsciousness, heat stroke, heat exhaustion, and frost bite . . . . . E-5
- .60 Theory and operation of RBA and OBA . . . . . E-6
- .61 Uses, cautions, and methods of administering morphine and similar drugs . . . . . E-6
- .62 Procurement and control of first aid supplies and equipment . . . . . E-6

M. ADMINISTRATION

1.00 Practical Factors

- .01 Be familiar with supply and stock number research . . . . . E-4
- .02 Know purpose of inspection forms, work orders, unsatisfactory reports and other related maintenance forms . . . . . E-4
- .40 Make entries in inspection forms, work orders, and Unsatisfactory Reports (UR) . . . . . E-5
- .41 Be familiar with weight and balance procedures . . . . . E-5
- .60 Requisition, inventory, issue, and account for allowed materials and spare parts . . . . . E-6
- .61 Maintain current loft and shop files of applicable technical publications, directives, and manuals . . . . . E-6
- .62 Maintain shop records of packing, inspection, test, and repair of equipment and material; prepare appropriate reports . . . . . E-6
- .63 Prepare aviation ordnance equipment and small arms ammunition reports . . . . . E-6
- .64 Use Coast Guard publications; Navy Stock List, NavSandA 2002, Section VIII, to identify and order technical publications, directives, and manuals . . . . . E-6
- .65 Organize and administer a survival equipment shop . . . . . E-6
- .66 Plan, schedule, and direct work assignments in a survival equipment shop . . . . . E-6
- .67 Interpret and apply bulletins and technical directives . . . . . E-6
- .80 Prepare reports for survey of material and equipment . . . . . E-7
- .81 Supervise inspection procedures to ensure that applicable technical specifications and standards of workmanship are met . . . . . E-7
- .82 Instruct personnel in assembly, loading, and maintenance procedures and techniques applicable to aviation ordnance equipment, and maintain quality control of work performed . . . . . E-7
- .83 Train and supervise personnel in proper handling and maintenance of parachutes, aviation survival equipment, pyrotechnics, small arms including ammunition and JATO. . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ASM

M. ADMINISTRATION - Continued

2.00 Examination Factors

.01	General knowledge of Coast Guard aviation organization and SAR operational plans . . . . .	E-4
.02	Types of information contained in periodic checklists, serial, standing, and aircraft work orders . . . . .	E-4
.40	Types of information contained in Unsatisfactory Reports of defective parachutes and survival equipment . . . . .	E-5
.60	Interpretation and application of Airplane or Helicopter Changes and Bulletins, Aviation Technical Orders and Notes (ATO's and ATN's) . . . . .	E-6
.61	Standard organization and maintenance procedures of Air Stations and Air Detachments. . . . .	E-6
.62	Organization and functions of the Aviation Supply System . . . . .	E-6
.63	Types of information to be recorded in each section of the Aircraft Log Book and Aeronautical Equipment Service Record . . . . .	E-6
.64	Types of information contained in aeronautical materials and equipment publications pertaining to survival equipment, parachutes, pyrotechnics, and JATO . . . . .	E-6
.80	Procedures for requesting manufacture and open purchase of aviation survival equipment and other equipment common to rating. . . . .	E-7
.81	Procedures for turning in and surveying aeronautical materials and equipment applicable to rating . . . . .	E-7
.82	Use of applicable allowance lists, parts catalogs, and forms in the requisitioning, inventorying, and accounting for ordnance materials and survival equipment . . . . .	E-7
.83	Purposes and procedures for man-hour accounting . . . . .	E-7

SENIOR CHIEF AVIATION SURVIVALMAN (ASMCS)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

.90	Plan a program of safety instruction and inspection pertaining to safety and survival equipment and assigned work areas . . . . .	E-8
.91	Collect and disseminate technical information concerning assigned equipment; direct attention to, and ensure compliance with, directives, publications, and instructions . . . . .	E-8
.92	Plan, organize, and supervise the functions of a safety and survival branch or sub-section . . . . .	E-8
.93	Coordinate functions between aviators' equipment section and various sub-sections in the maintenance section . . . . .	E-8
.94	Interpret maintenance instructions and directives to identify those applicable to safety, survival, and related equipment and convert into maintenance documents or orders . . . . .	E-8
.941	Ensure that established procedures are observed for conducting ground tests and for special and periodic inspections to maintain desired quality control . . . . .	E-8
.942	Review material allowance lists for adequacy and make recommendations for changes . . . . .	E-8
.943	Recommend changes in methods and techniques to promote maximum ground safety, safety of flight, and operational readiness of aircraft . . . . .	E-8
.944	Draft letters, instructions, notices, and messages applicable to aircraft maintenance activities. . . . .	E-8

SENIOR CHIEF AVIATION SURVIVALMAN (ASMCS) - Continued

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
ASM

2.00 Examination Factors

- .90 Capabilities, limitations, and reliability of safety and survival equipment . . . . . E-8
- .91 Procedures and practices employed in overhaul of parachutes, survival suits, and related equipment . . . . . E-8
- .92 Material control practices and supply management of policies employed in support of the Coast Guard Aircraft Maintenance Program . . . . . E-8
- .93 Regulations governing classification, preparation, safeguarding, and declassification of classified material . . . . . E-8
- .94 Methods for requisition, inventory, conservation, disposition, and survey of aviation ordnance material . . . . . E-8
- .941 Operation and maintenance of the ammunition and pyrotechnics stock reporting system. . . . . E-8

MASTER CHIEF AVIATION SURVIVALMAN (ASMCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Formulate guidelines to be used in safety inspections and instructions concerning potentially hazardous conditions and practices . . . . . E-9
- .96 Review and evaluate completed inspection records, quality control reports to ensure proper maintenance procedures are followed. . . . . E-9
- .97 Establish and implement a program for examining, interviewing, evaluating, and assigning personnel to ensure maximum utilization . . . . . E-9
- .98 Monitor implementation of preventive maintenance procedures to ensure current directives are being enforced . . . . . E-9
- .99 Review and evaluate aviation ordnance equipment safety requirements and initiate recommendations for improvement . . . . . E-9
- .991 Plan, implement, and prepare report material for an evaluation program of new equipment or material . . . . . E-9

2.00 Examination Factors

- .95 Methods and procedures for preparing and submitting survival equipment maintenance problems and staff type studies . . . . . E-9
- .96 General procedures for aircraft and component inventory, requisition, receipt, transfer, and survey . . . . . E-9

#3

Service Rating  
~~GENERAL RATING~~

PARACHUTE RIGGER (PR)

SCOPE

Parachute Riggers inspect, maintain and repair parachutes, survival equipment, flight protective clothing and equipment; pack and rig parachutes; pack and equip liferafts; fit and maintain oxygen masks, flight clothing and antiexposure suits; operate and repair sewing machines; maintain (shop test and repair) safety belts, shoulder harnesses, inertia reels; maintain oxygen equipment, portable fire extinguishers; replenish oxygen systems; instruct personnel in use of parachutes, survival equipment, protective clothing, special equipment packets, oxygen-breathing equipment, and air-sea rescue equipment carried by aircraft; when required, stow, maintain, operate and handle pyrotechnics, small arms including ammunition, and JATO; supervise operation of parachute lofts.

NOTE: In order to qualify for advancement to PR3, personnel must be a graduate of basic parachute rigger school, have met physical qualifications as prescribed in the USCG Medical Manual for student parachute jumpers, and have made at least one premeditated freefall jump under prescribed conditions at PR School only with a parachute personally packed under the supervision of a qualified parachute rigger.

NOTE: Practical Factors for the Parachute Rigger rating are applicable to the aircraft or equipment assigned or available.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PR

A. SAFETY

1.00 Practical Factors

- .01 Observe safety precautions when working in parachute lofts and shops, handling oxygen and carbon dioxide, and operating sewing machines . . . . . E-4
- .40 Observe safety precautions in use, handling and storage of flammable cements, solvents and thinners . . . . . E-5
- .80 Inspect work areas, tools and equipment to detect potentially hazardous and unsafe conditions and take appropriate action . . . E-7

2.00 Examination Factors

- .01 Safety precautions to be observed when working on the line and in the hangar or shop and while in flight (except those applicable exclusively to the control of an aircraft). . . . . E-4
- .02 Safety precautions applicable to aviation personnel to be observed in handling fuels and compressed gases . . . . . E-4
- .03 Safety precautions and regulations pertaining to the operation of the parachute loft, aviation survival shop, pyrotechnics, small arms including ammunition and JATO . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PR

B. PARACHUTES

1.00 Practical Factors

- .01 Inspect and pack personnel parachutes, make entries on parachute record and history cards . . . . . E-4
- .02 Unpack, wash and dry parachutes. . . . . E-4
- .03 Inspect parachute material for stains and deterioration. . . . . E-4
- .04 Make minor repairs to parachutes and component parts . . . . . E-4
- .40 Instruct plane captains, pilots and aircrewmembers in proper care, handling and stowage of parachutes. . . . . E-5
- .60 Measure temperature and humidity in parachute dry lockers and storage rooms. . . . . E-6
- .80 Instruct in the procedures for parachute landings in high winds, trees and water. . . . . E-7
- .81 Demonstrate aircraft emergency escape procedures and use of parachutes under simulated conditions . . . . . E-7

2.00 Examination Factors

- .01 General arrangement and facilities of parachute lofts. . . . . E-4
- .02 Types, component parts, construction and operation of personnel parachutes . . . . . E-4
- .40 Procedures for removing stains from parachute material . . . . . E-5
- .41 Standard procedures used in repair of parachutes . . . . . E-5
- .60 Temperature and humidity limitations for parachute dry lockers and storage rooms. . . . . E-6
- .61 Identifying characteristics and proper treatment for various causes of stains in parachute material . . . . . E-6
- .80 Purposes and operating principles of cargo and other types of non-personnel parachutes . . . . . E-7

C. FABRIC WORK

1.00 Practical Factors

- .01 Hand sew, stitch and tack material . . . . . E-4
- .02 Install and replace standard snap fasteners, grommets, slide fasteners and speedy rivets. . . . . E-4
- .03 Inspect and proof load safety belts and shoulder harnesses removed from aircraft. (Safety belts and shoulder harnesses are removed and installed in aircraft by personnel in the AM rating) . . . . . E-4
- .04 Operate standard sewing machines . . . . . E-4
- .40 Repair slide fasteners . . . . . E-5
- .41 Lubricate sewing machines and make minor adjustments . . . . . E-5
- .42 Cold patch rubberized material . . . . . E-5
- .43 Make fabric assemblies . . . . . E-5
- .44 Hand sew, dope and patch aircraft fabric surfaces and patch inspection holes. . . . . E-5
- .60 Develop and layout patterns from drawings, blueprints and photographs. . . . . E-6
- .80 Determine causes of sewing machine malfunctions; repair and replace parts . . . . . E-7

2.00 Examination Factors

- .01 Types and general characteristics of fabrics, tapes, webbings, fasteners, needles, thread and other material used in fabric work . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PR

C. FABRIC WORK - Continued

2.00 Examination Factors - Continued

- .02 Types and uses of seams and stitching patterns . . . . . E-4
- .03 Operating principles of standard sewing machines . . . . . E-4
- .40 Procedures for hand sewing, dopping and patching small holes and tears in aircraft fabric surfaces and patching inspection holes . . . . . E-5
- .41 Procedures for removing stains from fabric materials . . . . . E-5
- .60 Symbols and terms used on drawings and blueprints for fabric work . . . . . E-6
- .80 Specifications, characteristics and uses of fabrics, tapes, webbings, thread, hardware and other materials used in fabric work and allowable substitutes . . . . . E-7

D. FLIGHT AND PROTECTIVE CLOTHING AND EQUIPMENT

1.00 Practical Factors

- .01 Inspect and test lifevests and attached equipment . . . . . E-4
- .02 Inspect and clean oxygen masks . . . . . E-4
- .03 Remove and replace components of oxygen mask assemblies including mask-mounted oxygen regulators . . . . . E-4
- .04 Prepare required records and reports of flight and protective clothing and equipment inspections and maintenance . . . . . E-4
- .40 Patch lifevests and antiexposure suits . . . . . E-5
- .41 Repair flight clothing . . . . . E-5
- .42 Fit and repair antiexposure suits . . . . . E-5
- .43 Fit and adjust helmets and liners; install earphones and microphones. (Earphones and microphones are maintained by personnel in the AT rating.) . . . . . E-5
- .80 Fit and modify oxygen masks . . . . . E-7
- .81 Demonstrate use of flight and protective clothing and equipment under simulated conditions . . . . . E-7

2.00 Examination Factors

- .01 Techniques of packing, inspecting and handling aviation survival equipment, including protective clothing and special equipment kits . . . . . E-4
- .40 Use and application of fire retardant compounds for flight clothing . . . . . E-5
- .41 Regulations governing changes and repairs to flight and protective clothing and equipment . . . . . E-5

E. SURVIVAL EQUIPMENT AND PYROTECHNICS

1.00 Practical Factors

- .01 Inspect, test, equip and pack liferafts; replace carbon dioxide cylinders. (Liferaft ejection systems in aircraft are maintained by personnel in the AM rating. Emergency radio signaling units are delivered to the electronic shop for maintenance or exchange by personnel in the AT rating.) . . . . . E-4



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PR

E. SURVIVAL EQUIPMENT - Continued

1.00 Practical Factors - Continued

- .02 Operate carbon dioxide recharge equipment. . . . . E-4
- .03 Stow, handle, operate and maintain aviation pyrotechnics, small arms including ammunition, and JATO, observing local and general safety precautions. . . . . E-4
- .40 Patch holes and tears in liferafts . . . . . E-5
- .41 Demonstrate use of liferafts and equipment . . . . . E-5
- .60 Maintain carbon dioxide recharge equipment . . . . . E-6
- .61 Assemble, pack and rig airdrop survival kits and containers. . . . . E-6

2.00 Examination Factors

- .01 Types, construction and operation of liferafts . . . . . E-4
- .02 Procedures for maintaining pyrotechnics, JATO and small arms including ammunition . . . . . E-4
- .03 Methods of use of standard aviation survival equipment under emergency conditions . . . . . E-4
- .40 Principles of operation of carbon dioxide cylinder components used in liferafts. . . . . E-5
- .60 Construction of various types of liftwebs and sling assemblies for use on cargo to be dropped with aerial delivery parachutes . . . . . E-6

F. OXYGEN EQUIPMENT

1.00 Practical Factors

- .01 Service aircraft with oxygen, using oxygen transfer trailers or direct filling equipment; purge aircraft oxygen systems . . . . . E-4
- .02 Ground check oxygen systems for proper operation . . . . . E-4
- .40 Remove and install aircraft oxygen system components . . . . . E-5
- .41 Maintain oxygen transfer trailers. . . . . E-5
- .60 Analyze system malfunctions, isolate defective components, and determine corrective action. . . . . E-6
- .61 Shop test, repair or replace components as necessary . . . . . E-6

2.00 Examination Factors

- .01 Operating principles of aircraft oxygen systems. . . . . E-4
- .40 Operating principles of oxygen system components . . . . . E-5
- .60 Procedures for testing oxygen systems. . . . . E-6
- .61 Types and operating principles of oxygen shop transfer and recharge equipment. . . . . E-6

G. ADMINISTRATION

1.00 Practical Factors

- .01 Know purpose of inspection forms, work orders, unsatisfactory reports and other related maintenance forms. . . . . E-4
- .40 Make entries in inspection forms, work orders and Unsatisfactory Reports (UR) . . . . . E-5
- .41 Be familiar with weight and balance procedures . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PR

G. ADMINISTRATION - Continued

1.00 Practical Factors - Continued

- .60 Inventory and order equipment, spare parts and material. . . . . E-6
- .61 Maintain current loft and shop files of applicable technical publications, directives and manuals . . . . . E-6
- .62 Prepare reports of test and repair of oxygen regulators. . . . . E-6
- .63 Maintain loft and shop records of packing, inspection, test and repair of equipment and material; prepare appropriate reports. . . . . E-6
- .64 Use Coast Guard publications; Navy Stock List, NavSandA 2002, Section VIII, to identify and order technical publications, directives and manuals . . . . . E-6
- .80 Organize and administer a parachute loft . . . . . E-7
- .81 Plan, schedule and direct work assignments in a parachute loft . . . . . E-7
- .82 Interpret and apply bulletins and technical directives . . . . . E-7
- .83 Prepare reports for survey of material and equipment . . . . . E-7
- .84 Supervise inspection procedures to insure that applicable technical specifications and standards of workmanship are met. . . . . E-7

2.00 Examination Factors

- .01 General knowledge of Coast Guard aviation organization and SAR operational plans. . . . . E-4
- .02 Types of information contained in periodic checklists, serial, standing, and aircraft work orders . . . . . E-4
- .40 Types of information contained in Unsatisfactory Reports of defective parachutes and survival equipment. . . . . E-5
- .60 Interpret and apply Airplane or Helicopter Changes and Bulletins, Aviation Technical Orders and Notes (ATO's and ATN's) . . . . . E-6
- .61 Standard organization and maintenance procedures of Air Stations and Air Detachments. . . . . E-6
- .62 Organization and functions of the Aviation Supply System . . . . . E-6
- .63 Types of information to be recorded in each section of the Aircraft Log Book and Aeronautical Equipment Service Record . . . . . E-6
- .64 Types of information contained in aeronautical materials and equipment publications pertaining to aeronautical materials, survival equipment and parachutes . . . . . E-6
- .80 Procedures for requesting manufacture and open purchase of aviation survival equipment. . . . . E-7
- .81 Procedures for turning in and surveying parachutes and survival equipment . . . . . E-7
- .82 Use of applicable allowance lists, parts catalogs, and forms in the requisitioning, inventorying and accounting for aviation materials and survival equipment . . . . . E-7
- .83 Purposes and procedures for man-hour accounting. . . . . E-7
- .84 Train and supervise personnel in proper handling and maintenance of parachutes, aviation survival equipment, pyrotechnics, small arms including ammunition, and JATO . . . . . E-7

★ SENIOR CHIEF PARACHUTE RIGGER (PRCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PR

1.00 Practical Factors

- .90 Plan a program of safety instruction and inspection pertaining to safety and survival equipment and assigned work areas . . . . . E-8
- .91 Collect and disseminate technical information concerning assigned equipment; direct attention to, and ensure compliance with, directives, publications, and instructions . . . . . E-8
- .92 Plan, organize, and supervise the functions of a safety and survival branch or sub-section . . . . . E-8
- .93 Coordinate functions between aviators' equipment section and various sub-sections in the maintenance section . . . . . E-8
- .94 Interpret maintenance instructions and directives to identify those applicable to safety, survival, and related equipment and convert into maintenance documents or orders . . . . . E-8
- .941 Ensure that established procedures are observed for conducting ground tests and for special and periodic inspections to maintain desired quality control . . . . . E-8
- .942 Review material allowance lists for adequacy and make recommendations for changes . . . . . E-8
- .943 Recommend changes in methods and techniques to promote maximum ground safety, safety of flight, and operational readiness of aircraft . . . . . E-8
- .944 Draft letters, instructions, notices, and messages applicable to aircraft maintenance activities . . . . . E-8

2.00 Examination Factors

- .90 Capabilities, limitations, and reliability of safety and survival equipment . . . . . E-8
- .91 Procedures and practices employed in overhaul of parachutes, survival suits, and related equipment . . . . . E-8
- .92 Material control practices and supply management policies employed in support of the Coast Guard Aircraft Maintenance Program . . . . . E-8
- .93 Regulations governing classification, preparation, safeguarding, and declassification of classified material . . . . . E-8

★ MASTER CHIEF PARACHUTE RIGGER (PRCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Formulate guidelines to be used in safety inspections and instructions concerning potentially hazardous conditions and practices . . . . . E-9
- .96 Review and evaluate completed inspection records, quality control reports to ensure proper maintenance procedures are followed . . . . . E-9
- .97 Establish and implement a program for examining interviewing, evaluating, and assigning personnel to ensure maximum utilization . . . . . E-9
- .98 Monitor implementation of preventive maintenance procedures to ensure current directives are being enforced . . . . . E-9

MASTER CHIEF PARACHUTE RIGGER (PRCM) - Continued

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PR

2.00 Examination Factors

- .95 Methods and procedures for preparing and submitting survival equipment maintenance problems and staff type studies . . . . . E-9
- .96 General procedures for aircraft and component inventory, requisition, receipt, transfer, and survey . . . . . E-9



BU



CM



EA



EO



SW



UT

# CONSTRUCTION GROUP VI

Builder	BU
Construction Mechanic	CM
Engineering Aide	EA
Equipment Operator	EO
Steel Worker	SW
Utilities Man	UT

BUILDER (BU)

EMERGENCY RATING (PO1 and CPO)

SCOPE

Builders plan, supervise, and perform tasks required for construction, maintenance, and repair of wood, concrete, and masonry structures, concrete pavement, and water front structures; plan and direct placement and flow of building materials; form and direct efforts of crews to perform rough and finished carpentry; erect and repair piers, cofferdams and trestles; fabricate and erect forms; mix, place, and finish concrete; and lay or set masonry.

EMERGENCY RATINGS (PO3 and PO2)

SCOPES

BUILDER H (Heavy) - BUH

Builders (H) construct, maintain, and repair wooden structures, such as trestles, piers, and wharves, and construct cofferdams; select and position piles for driving; hew, notch, and fit timber for site assembly; and cut, bore, treat with preservative, and place timber and planking for water front structures.

BUILDER L (Light) - BUL

Builders (L) construct, maintain, and repair wooden structures, such as office buildings and barracks; fabricate and erect forms for concrete structures; cut, fit, and erect building framework, partitions, and walls; erect, maintain, and repair prefabricated structures (light); operate power tools to produce matched and fitted assemblies; fit and install doors, windows, cabinets, and trim; and paint and varnish new and repaired surfaces.

BUILDER R (Concrete) - BUR

Builders (R) mix, place, and finish concrete for buildings, roads, bridges, foundations, retaining walls, and underwater structures; lay or set masonry; operate batch plants, control mixing of transit mix and place concrete; finish and cure concrete; place and finish concrete for slabs and panels; and manufacture concrete pipe and block.

QUALIFICATIONS FOR ADVANCEMENT

A. TOOLS AND EQUIPMENT	Required for Advancement to			
	BU	BUH	BUL	BUR
1.00 Practical Factors				
.01 Use, maintain, and repair handtools commonly used in construction of wooden and concrete structures . . . . .	-	E-4	E-4	E-4
.02 Operate and service power-driven portable tools . . . . .	-	E-4	E-4	E-4
.03 Operate planers, powersaws, jointers, sanders, and other woodworking shop equipment . . . . .	-	-	E-4	-
.04 Operate portable concrete and mortar mixers, concrete finishing machines, concrete vibrators, and masonry saws . . .	-	-	-	E-4
.40 Service, perform preventive maintenance on, and make repairs to:				
a. Planers, powersaws, jointers, sanders, and other woodworking shop equipment . . . . .	-	-	E-5	-
b. Concrete and mortar mixers, concrete finishing machines, concrete vibrators, and masonry saws . . . . .	-	-	-	E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BU BUH BUL BUR

A. TOOLS AND EQUIPMENT - Continued

2.00 Examination Factors

None.

B. PAINTS, PRESERVATIVES, AND GLAZING

1.00 Practical Factors

.01	Prepare surfaces for painting and varnishing . . . . .	-	-	E-4	-
.02	Apply paints, varnishes, and other chemical coatings . . . . .	-	E-4	E-4	-
.40	Prepare and apply impregnating preservatives . . . . .	-	E-5	E-5	-
.41	Mix paint and chemical coating to consistency required for brushing, rolling on, and spraying, adding thinners and dryers; box paints and chemical coatings . . . . .	-	-	E-5	-
.42	Use and maintain spray painting equipment . . . . .	-	-	E-5	-
.43	Cut glass and glaze window sash . . . . .	-	-	E-5	-

2.00 Examination Factors

None.

C. CONCRETE AND MASONRY

1.00 Practical Factors

.01	Serve as crew member in concrete and masonry operations . . . . .	-	-	-	E-4
.02	Mix and use mortars and grouts for concrete and masonry construction . . . . .	-	-	-	E-4
.40	Lay brick, concrete block, and tile; lay and bind masonry to form walls, piers, and abutments . . . . .	-	-	-	E-5
.41	Set steel forms for paving . . . . .	-	-	-	E-5
.42	Finish concrete to required type and surface . . . . .	-	-	-	E-5
.43	Cast and erect precast concrete structures . . . . .	-	-	-	E-5
.60	Control mixing of transit mix from batch plant . . . . .	E-6	-	-	-
.61	Use engineer's level to set stakes . . . . .	E-6	-	-	-
.62	Determine charges for producing required concrete mixes . . . . .	E-6	-	-	-
.63	Perform slump tests on concrete . . . . .	E-6	-	-	-

2.00 Examination Factors

.01	Methods of finishing concrete . . . . .	-	-	-	E-4
.40	Methods of grading aggregate . . . . .	-	-	-	E-5
.41	Characteristics and uses of concrete mixes; reasons for and methods of curing concrete . . . . .	-	-	-	E-5
.42	Use of special admixtures for concrete and placing of concrete by special methods . . . . .	-	-	-	E-5
.43	Methods of batching and weighing concrete . . . . .	-	-	-	E-5
.44	Principles of operation of concrete paving machines . . . . .	-	-	-	E-5
.45	Principles and procedures used in tying and placing reinforcing steel . . . . .	-	-	-	E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BU BUH BUL BUR

C. CONCRETE AND MASONRY - Continued

2.00 Examination Factors - Continued

.46	Principles and methods of setting floor and wall tile . . . . .	-	-	-	E-5
.60	Principles of layout and operation of concrete batching plants . . . . .	E-6	-	-	-
.61	Manufacture of reinforced concrete pipe and concrete block . . .	E-6	-	-	-
.62	Principles and methods of plastering and stuccoing . . . . .	E-6	-	-	-
.63	Determine quantities, types, and shapes of floor and wall tile and accessories . . . . .	E-6	-	-	-

D. CARPENTRY AND WOODEN STRUCTURES

1.00 Practical Factors

.01	Serve as a crew member in:				
	a. Erection of prefabricated structures . . . . .	-	-	E-4	-
	b. Construction and erection of waterfront structures, bridges, water storage tanks (wood), and cofferdams . . . . .	-	E-4	-	-
.02	Cut and join wooden members . . . . .	-	E-4	E-4	-
.03	Use and strip wooden and metal concrete forms . . . . .	-	E-4	E-4	E-4
.39	Perform assigned tasks in:				
	a. Rough carpentry . . . . .	-	E-4	E-4	-
	b. Roof construction . . . . .	-	-	E-4	-
	c. Finished carpentry . . . . .	-	-	E-5	-
	d. Waterfront structures, bridges, and cofferdams . . . . .	-	E-5	-	-
.40	Construct, erect, maintain, and repair field-type latrines and incinerators; and erect, under general supervision, prefabricated buildings and tents . . . . .	-	-	E-5	-
.41	Erect and repair wooden stave tanks . . . . .	-	E-5	-	-
.42	Prepare piles for placing . . . . .	-	E-5	-	-
.43	Act as a pile setter by placing and guiding piles . . . . .	-	E-5	-	-
.44	Construct wooden forms with necessary bracing for concrete construction . . . . .	-	E-5	E-5	-
.60	Build and install interior and exterior finish carpentry in accordance with plans, sketches, instructions, and specifications . . . . .	E-6	-	-	-

2.00 Examination Factors

.01	Types and uses of lumber; nominal and actual size of lumber and methods of computing board feet . . . . .	-	E-4	E-4	-
.02	Terminology for structural members of buildings and concrete forms . . . . .	-	E-4	E-4	E-4
.40	Layout of structural members in wooden structures and forms. . .	-	E-5	E-5	E-5
.41	Types and uses of piles; methods of driving piles . . . . .	-	E-5	-	-
.60	Types and characteristics of standard advance base prefabricated structures . . . . .	E-6	-	-	-
.61	Uses and methods of constructing cofferdams . . . . .	E-6	-	-	-
.62	Types of roofing and flooring materials and methods of application . . . . .	E-6	-	-	-



**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
EU BUH BUL BUR

**E. DRAWINGS AND SKETCHES**

**1.00 Practical Factors**

- .01 Read and work from simple drawings and sketches . . . . . - E-4 E-4 E-4
- .40 Read and work from building plans and specifications . . . . . - E-5 E-5 E-5
- .60 Prepare sketches for carpentry and concrete form work . . . . . E-6 - - -

**2.00 Examination Factors**

None.

**F. HOISTING EQUIPMENT AND TACKLE**

**1.00 Practical Factors**

- .01 Use standard hand signals for hoisting operations . . . . . - E-4 E-4 E-4
- .40 Erect and use simple gin poles and "A" frames to hoist construction materials . . . . . - E-5 E-5 E-5

**2.00 Examination Factors**

- .40 Methods of material handling . . . . . - E-5 E-5 E-5
- .41 Kinds and sizes of wire and manila rope used for swinging scaffolds and rigging simple gin poles and "A" frames . . . . . - E-5 E-5 E-5

**G. FOREMANSHIP**

**1.00 Practical Factors**

- .60 Prepare progress reports, job orders, and material requisitions and conduct inventories . . . . . E-6 - - -
- .61 Make equipment and material estimates from drawings, sketches, and specifications . . . . . E-6 - - -
- .62 Supervise and train personnel engaged in light, heavy, and concrete construction . . . . . E-6 - - -
- .80 Conduct training programs to qualify personnel for advancement in rating, including cross-training of personnel for advancement to the EU rating . . . . . E-7 - - -
- .81 Control site deployment of materials and equipment . . . . . E-7 - - -
- .82 Train individuals and drill crews in safe and expeditious execution of assigned tasks . . . . . E-7 - - -
- .83 Direct and coordinate composition and efforts of crews . . . . . E-7 - - -
- .84 Direct general job operations involving light, heavy, and concrete construction . . . . . E-7 - - -

**2.00 Examination Factors**

- .60 Principles and techniques of supervision and job control . . . . . E-6 - - -
- .61 Basic principles of camouflage . . . . . E-6 - - -

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BU BUH BUL BUR

H. DEFENSIVE TACTICS

1.00 Practical Factors

.01	Perform duties of a fire team leader . . . . .	-	E-4	E-4	E-4
.02	Maneuver fire team into formation using combat hand and arm signals . . . . .	-	E-4	E-4	E-4
.03	Demonstrate use of protective measures such as entrenchment, cover, and concealment . . . . .	-	E-4	E-4	E-4
.04	Utilize map and compass for locating objects, points, and elevations . . . . .	-	E-4	E-4	E-4
.05	Interpret signs and symbols used in military maps . . . . .	-	E-4	E-4	E-4
.06	Operate communication equipment for intracompany communication .	-	E-4	E-4	E-4
.39	Instruct personnel in duties at the following levels:				
	a. Fire team . . . . .	-	E-4	E-4	E-4
	b. Squad . . . . .	-	E-5	E-5	E-5
	c. Platoon . . . . .	E-6	-	-	-
	d. Company . . . . .	E-7	-	-	-
.40	Perform duties of a squad leader and platoon guide . . . . .	-	E-5	E-5	E-5
.41	Post and instruct perimeter guards . . . . .	-	E-5	E-5	E-5
.42	Perform duties of an assistant to the squad leader in scouting and patrolling missions . . . . .	-	E-5	E-5	E-5
.43	Prepare rough maps, field sketches, and overlays . . . . .	-	E-5	E-5	E-5
.60	Direct fire of support weapons pertaining to a platoon . . . . .	E-6	-	-	-
.61	Supervise patrolling and scouting missions . . . . .	E-6	-	-	-
.80	Perform duties of a platoon commander . . . . .	E-7	-	-	-
.81	Assist in formulating plans of action for a company . . . . .	E-7	-	-	-
.82	Assist in operations of a company command post . . . . .	E-7	-	-	-

2.00 Examination Factors

.01	Types and uses of weapons and ammunition used by the battalion . . . . .	-	E-4	E-4	E-4
.02	Field techniques for individual and group protection in NBC warfare . . . . .	-	E-4	E-4	E-4
.40	Elements of field sanitation . . . . .	-	E-5	E-5	E-5
.41	Battalion of defense organization . . . . .	-	E-5	E-5	E-5
.60	Methods of assigning field of fire, general target areas, or types of targets . . . . .	E-6	-	-	-

I. SAFETY

1.00 Practical Factors

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
BU BUH BUL BUR

I. SAFETY - Continued

2.00 Examination Factors

.01	Safety precautions to be observed in shops, in utilization of equipment and on construction jobs . . . . .	-	E-4	E-4	E-4
.02	Procedures and safety measures in mixing, storing, and using paints, varnishes, and impregnating preservatives . . . . .	-	E-4	E-4	-
.03	Safety precautions to be observed while engaged in the construction of buildings, waterfront structures, and concrete work . . . . .	-	E-4	E-4	E-4

**CONSTRUCTION MECHANIC (CM)**

**EMERGENCY RATING (PO1 and CPO)**

**SCOPE**

Construction Mechanics schedule, oversee and perform tasks involved in maintenance, repair and overhaul of automotive, materials-handling and construction equipment; assign and supervise activities of assistants who locate, analyze and correct malfunctions in equipment; issue repair parts; and maintain records and prepare requisitions and reports and train assistants in repair procedures and techniques.

**EMERGENCY RATINGS (PO3 and PO2)**

**SCOPES**

**CONSTRUCTION MECHANIC A (Automotive) - CMA**

Construction Mechanics (A) service, perform preventive maintenance on, repair and overhaul materials-handling equipment, automotive vehicles except dump trucks over 10 tons, gasoline and diesel engines, air compressors below 105 c.f.m., internal-combustion prime movers of arc welders, electric generators up to and including 5 kw., and mobile water distillation and purification units; and locate, analyze and correct faulty conditions in this equipment.

**CONSTRUCTION MECHANIC H (Construction) - CMH**

Construction Mechanics (H) service, perform preventive maintenance on, repair and overhaul construction equipment, gasoline and diesel engines, air compressors 105 c.f.m. and larger, and internal-combustion prime movers of electric generators larger than 5 kw.; and locate, analyze and correct faulty conditions in this equipment.

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
CM CMA CMH

**A. AUTOMOTIVE AND MATERIALS-HANDLING EQUIPMENT**

**1.00 Practical Factors**

.01	Service, adjust and make minor repairs to electrical systems used in automotive, materials-handling and construction equipment. . . . .	E-4	E-4	-
.02	Service automotive and materials-handling equipment in accordance with lubrication charts and manufacturers' service instructions. . .	E-4	-	-
.03	Service, perform preventive maintenance on, and make minor repairs to:			
	a. Chassis and frames of automotive and materials-handling equipment	E-4	-	-
	b. Gasoline and diesel fuel systems in automotive and materials-handling equipment . . . . .	E-4	-	-
.04	Service and adjust hydraulic, pneumatic and mechanical brakes on automotive and materials-handling equipment. . . . .	E-4	-	-
.05	Operate automotive and materials-handling equipment as required to perform maintenance, repair and overhaul tasks . . . . .	E-4	-	-
.40	Make major repairs to and overhaul power train units, electrical systems, hydraulic systems, pneumatic systems and fuel systems of automotive and materials-handling equipment. . . . .	E-5	-	-
.41	Adjust, service and repair springs, shock absorbers, axles, wheels and steering mechanisms of automotive and materials-handling equipment	E-5	-	-
.42	Repair and overhaul gasoline and diesel engines of automotive and materials-handling equipment . . . . .	E-5	-	-
.43	Service and repair air or vacuum booster brakes. . . . .	E-5	-	-
.60	Locate, analyze and direct the correction of abnormal operation or faulty condition in automotive and materials-handling equipment. . .	E-6	-	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
CM CMA CMH

A. AUTOMOTIVE AND MATERIALS-HANDLING EQUIPMENT - Continued

2.00 Examination Factors

.01	Function and relation of principal parts in gasoline and diesel engines . . . . .	E-4	E-4	-
.02	Construction and operation of two-stroke cycle and fourstroke internal combustion engines. . . . .	E-4	E-4	-
.03	Navy designations of lubricants used in automotive, materials-handling and construction equipment. . . . .	E-4	E-4	-
.04	Function and construction of:			
	a. Springs, axles, wheels and steering mechanisms used in automotive and materials-handling equipment . . . . .	E-4	E-4	-
	b. Power trains including clutches, transmissions, transfer cases, propeller shaft assemblies, final drives, differentials, fluid couplings, torque converters and planetary gear trains for automotive equipment . . . . .	E-4	-	-
.05	Operating principles of gasoline and diesel fuel systems . . . . .	E-4	E-4	-
.06	Operating principles of hydraulic systems, air compressors and air brakes used in automotive and materials-handling equipment . . . . .	E-4	-	-
.07	Basic theory of direct and alternating current pertaining to electrical systems used on automotive, materials-handling and construction equipment . . . . .	E-4	E-4	-

B. CONSTRUCTION EQUIPMENT

1.00 Practical Factors

.01	Service construction equipment in accordance with preventive maintenance service and inspection guides, manufacturers' lubrication charts and service instructions. . . . .	-	E-4	-
.02	Service, perform preventive maintenance on and make minor repairs to:			
	a. Chassis and frames of construction equipment . . . . .	-	E-4	-
	b. Gasoline and diesel fuel systems in construction equipment . . . . .	-	E-4	-
.03	Service and adjust hydraulic, pneumatic and mechanical brakes on construction equipment . . . . .	-	E-4	-
.04	Operate Construction equipment as required to carry out maintenance, repair and overhaul tasks. . . . .	-	E-4	-
.40	Make major repairs to chassis and frames of construction equipment . . . . .	-	E-5	-
.41	Make major repairs to and overhaul power train units, electrical systems, hydraulic systems, pneumatic systems and fuel systems of construction equipment . . . . .	-	E-5	-
.42	Adjust, service and repair springs, shock absorbers, axles, wheels and steering systems used in construction equipment. . . . .	-	E-5	-
.43	Perform major repairs and overhaul on gasoline and diesel engines used on construction equipment . . . . .	-	E-5	-
.60	Locate, analyze and direct the correction of abnormal operation or faulty condition in construction equipment . . . . .	-	-	E-6

2.00 Examination Factors

.01	Function and construction of springs, axles and steering mechanisms for construction equipment. . . . .	-	E-4	-
.02	Operating principles of hydraulic systems, air compressors and air brakes used in construction equipment. . . . .	-	E-4	-
.03	Function and construction of power trains, including clutches, transmissions, transfer cases, propeller shaft assemblies, final drives and differentials on construction equipment . . . . .	-	E-4	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
CM CMA CMH

B. CONSTRUCTION EQUIPMENT - Continued

2.00 Examination Factors - Continued

- .04 Principles of operation of fluid couplings, torque converters and automatic transmissions used in construction equipment . . . . . - E-4 -

C. TOOLS AND EQUIPMENT

1.00 Practical Factors

- .01 Use block and tackle and chain hoists and jacks to service, perform preventive maintenance on, repair and overhaul:
  - a. Automotive and materials-handling equipment. . . . . E-4 - -
  - b. Construction equipment . . . . . - E-4 -
- .02 Select and use hand and power tools and related materials commonly used to perform maintenance, repair and overhaul services to:
  - a. Automotive and materials-handling equipment. . . . . E-4 - -
  - b. Construction equipment . . . . . - E-4 -
- .40 Use shop test equipment and interpret readings . . . . . E-5 E-5 -
- .41 Use micrometers, inside-outside calipers, feeler gages and dial indicators to perform maintenance, repair and overhaul services to:
  - a. Automotive and materials-handling equipment. . . . . E-5 - -
  - b. Construction equipment . . . . . - E-5 -
- .42 Maintain and repair shop tools and equipment . . . . . E-5 E-5 -

2.00 Examination Factors

- .01 Principles of simple machines; use, theory and mechanical advantage of gears, pulleys and levers . . . . . E-4 E-4 -

D. TIRES AND BATTERIES

1.00 Practical Factors

- .01 Check, test and make repairs to tires and tubes. . . . . E-4 E-4 -
- .02 Service, test, charge and install storage batteries. . . . . E-4 E-4 -

2.00 Examination Factors

- .01 Storage of tires, tubes and batteries. . . . . E-4 E-4 -
- .02 Construction and characteristics of storage batteries. . . . . E-4 E-4 -
- .40 Principles of wheel alignment and balancing; causes of uneven or excessive wear on tires. . . . . E-5 - -

E. DRAWINGS, SKETCHES AND DIAGRAMS

1.00 Practical Factors

- .01 Read wiring diagrams, lubrication charts and schematic sketches to service, perform preventive maintenance on, repair and overhaul:
  - a. Automotive and materials-handling equipment. . . . . E-4 - -
  - b. Construction equipment . . . . . - E-4 -
- .40 Work from wiring diagrams and manufacturers' shop manuals in the maintenance, repair and overhaul of:
  - a. Automotive and materials-handling equipment. . . . . E-5 - -
  - b. Construction equipment . . . . . - E-5 -

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
CM CMA CMH

E. DRAWINGS, SKETCHES AND DIAGRAMS - Continued

2.00 Examination Factors

- .01 Common symbols and abbreviations used in diagrams, sketches and charts for automotive and construction equipment. . . . . E-4 E-4 -

F. SAFETY

1.00 Practical Factors

- .01 Demonstrate proper use of various safety devices and equipment located in shops . . . . . E-4 E-4 -

2.00 Examination Factors

- .01 Portable firefighting equipment for extinguishing petroleum and electric fires . . . . . E-4 E-4 -
- .02 Safety precautions to be observed while servicing and repairing:
  - a. Automotive and materials-handling equipment. . . . . E-4 - -
  - b. Construction equipment . . . . . - E-4 -
- .03 Safety precautions to be observed in testing, charging, repairing and servicing of storage batteries . . . . . E-4 E-4 -
- .04 Safety precautions to be observed in handling and mixing electrolyte . . . . . E-4 E-4 -

G. FOREMANSHIP

1.00 Practical Factors

- .60 Prepare inspection reports, shop repair orders and material and repair parts requests. . . . . - - E-6
- .61 Direct the preparation and maintenance of vehicle history jackets, preventive maintenance and overhaul schedules for automotive, materials-handling and construction equipment. . . . . - - E-6
- .62 Supervise and train personnel in the below-listed functions, on automotive, materials-handling and construction equipment:
  - a. Service and repair . . . . . - - E-6
  - b. Storage and preservation . . . . . - - E-6
- .63 Supervise and train personnel engaged in installing, use and removal of water fording gear on automotive and construction equipment . . . - - E-6
- .80 Conduct training program to qualify personnel for advancement in the CM rating. . . . . - - E-7
- .81 Plan and control layout of fixed and portable shop equipment for efficient operation of automotive, materials-handling and construction equipment repair facilities . . . . . - - E-7
- .82 Train individuals and drill crews on safe and expeditious execution of assigned tasks. . . . . - - E-7
- .83 Direct and coordinate composition and efforts of crews . . . . . - - E-7
- .84 Direct general job operations involving service and repair of automotive, materials-handling and construction equipment. . . . . - - E-7

2.00 Examination Factors

- .60 Principles and techniques of supervision and job control . . . . . - - E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
CM CMA CMH

H. DEFENSIVE TACTICS

1.00 Practical Factors

.01	Perform duties of a fire team leader . . . . .	E-4	E-4	-
.02	Maneuver fire team into formation using combat hand and arm signals.	E-4	E-4	-
.03	Demonstrate use of protective measures such as entrenchment, cover and concealment. . . . .	E-4	E-4	-
.04	Utilize map and compass for locating objects, points and elevations.	E-4	E-4	-
.05	Interpret signs and symbols used in military maps. . . . .	E-4	E-4	-
.06	Operate communication equipment for intracompany communication . . .	E-4	E-4	-
.39	Instruct personnel in duties at the following levels:			
	a. Fire team. . . . .	E-4	E-4	-
	b. Squad. . . . .	E-5	E-5	-
	c. Platoon. . . . .	-	-	E-6
	d. Company. . . . .	-	-	E-7
.40	Perform duties of a squad leader and platoon guide . . . . .	E-5	E-5	-
.41	Post and instruct perimeter guards . . . . .	E-5	E-5	-
.42	Perform duties of an assistant to the squad leader in scouting and patrolling missions. . . . .	E-5	E-5	-
.43	Prepare rough maps, filed sketches and overlays. . . . .	E-5	E-5	-
.60	Direct fire of support weapons pertaining to a platoon . . . . .	-	-	E-6
.61	Supervise patrolling and scouting missions . . . . .	-	-	E-6
.80	Perform duties of a platoon commander. . . . .	-	-	E-7
.81	Assist in formulating plans of action for a company. . . . .	-	-	E-7
.82	Assist in operations of a company command post . . . . .	-	-	E-7

2.00 Examination Factors

.01	Types and uses of ammunition used by the battalion . . . . .	E-4	E-4	-
.02	Field techniques for individual and group protection in NBC warfare.	E-4	E-4	-
.40	Elements of field sanitation . . . . .	E-5	E-5	-
.41	Battalion defense organization . . . . .	E-5	E-5	-
.60	Methods of assigning field of fire, general target areas or types of targets . . . . .	-	-	E-6
.61	Types and uses of infantry weapons in accordance with current construction battalion allowance . . . . .	-	-	E-6



ENGINEERING AID (EA)

EMERGENCY RATING (PO1 and CPO)

SCOPE

Engineering Aids plan, supervise, and perform tasks required in construction surveying, drafting, planning, and estimating, and quality control; prepare progress reports, time records, construction schedules and material, and labor estimates; establish and operate a basic quality control system for testing soils, concrete, and construction materials; prepare, edit, and reproduce construction drawings; and make and control surveys, performing such tasks as running and closing traverses, staking out underground excavations, and obtaining and converting field notes into topographic maps.

EMERGENCY RATINGS (PO3 and PO2)

SCOPES

ENGINEERING AID D (Draftsman) - EAD

Engineering Aids (D) prepare, edit, and file construction drawings, plans, sketches, tracings, and maps; operate machines to reproduce drawings; prepare material estimates and bills of material; process data required for operation of construction reports; operate transits, levels, and other surveying instruments; and perform basic quality control tests.

ENGINEERING AID S (Surveyor) - EAS

Engineering Aids (S) make reconnaissance, preliminary, final location, and construction surveys; operate, adjust, and maintain transits, levels, alidades and other surveying instruments; keep field notes; make drawings, sketches, and plot maps, cross sections and profiles; and perform engineering tests on soils, concrete, and construction materials.

QUALIFICATIONS FOR ADVANCEMENT

A. SURVEYING AND DRAFTING FUNDAMENTALS

Required for  
Advancement to  
EA EAD EAS

1.00 Practical Factors

.01	Identify principal methods of surveying . . . . .	-	E-4	E-4
.02	Demonstrate use of symbols, lines, and scales used on maps, site plans, cross sections and profiles, construction drawings, and charts . . . . .	-	E-4	E-4
.03	Make drawing measurements; divide and subdivide distances, using architectural and engineering scales . . . . .	-	E-4	E-4
.04	Draw plane geometric constructions . . . . .	-	E-4	E-4
.05	Letter neatly and legibly by freehand in commercial Gothic style and using lettering devices . . . . .	-	E-4	E-4
.06	Trace and revise drawings, maps, and charts . . . . .	-	E-4	E-4
.07	Draw freehand sketches from existing objects or dimensions and verbal descriptions . . . . .	-	E-4	E-4
.08	Read and interpret simple drawings, maps, and charts . . . . .	-	E-4	E-4
.09	Make third angle orthographic projection, single auxiliaries, and sectioning . . . . .	-	E-4	E-4
.10	Operate reproduction machines of the blueprint or ammonia vapor types . . . . .	-	E-4	E-4
.38	Operate overhead or opaque projectors . . . . .	-	E-4	E-5

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
EA EAD EAS

**A. SURVEYING AND DRAFTING FUNDAMENTALS - Continued**

**1.00 Practical Factors - Continued**

.39	Perform basic surveying duties:			
	a. Perform chaining procedures . . . . .	-	E-5	E-4
	b. Mark, place, and drive survey stakes, batter boards, and hubs . . . . .	-	E-5	E-4
	c. Set points on stakes, concrete, and asphalt . . . . .	-	E-5	E-4
	d. Maintain and make field repairs to steel tapes . . . . .	-	E-5	E-4
	e. Give accurate sights using plumb bob and range pole and demonstrate all standard surveyor's hand signals . . . . .	-	E-5	E-4
	f. Locate topography using metallic tapes . . . . .	-	E-5	E-4
	g. Read a level rod with and without a target and give plumb and accurate shots for leveling, using level rod . . . . .	-	E-5	E-4
	h. Select and set a turning point . . . . .	-	E-5	E-4
	i. Locate, select and give shots for topography with level rod or stadia board . . . . .	-	E-5	E-4
	j. Record field notes . . . . .	-	E-5	E-4
.40	Use tables and data from handbooks and technical publications for drafting and surveying purposes . . . . .	-	E-5	E-5

**2.00 Examination Factors**

.01	Reproduction methods, procedures, and materials . . . . .	-	E-4	E-4
.02	Use of NavDocks DM-6 and Military Standards . . . . .	-	E-4	E-4
.40	Principles of isometric and oblique drawing . . . . .	-	E-5	-
.41	Freehand perspective drawing . . . . .	-	E-5	-
.60	Types of map and chart projections (Mercator, polyconic, Lambert conformal, gnomonic, polar gnomonic and Universal Transverse Mercator) . . . . .	E-6	-	-

**B. OPERATION AND ADJUSTMENTS OF SURVEYING, DRAFTING, AND MATERIAL TESTING EQUIPMENT**

**1.00 Practical Factors**

.01	Clean, maintain, and stow:			
	a. Surveying equipment . . . . .	-	-	E-4
	b. Drafting and material testing equipment . . . . .	-	E-4	E-4
.39	Select and use:			
	a. Drafting equipment . . . . .	-	E-4	E-4
	b. Surveying and material testing equipment . . . . .	-	E-5	E-4

**2.00 Examination Factors**

.01	Nomenclature of drafting, surveying, and materials testing equipment . . . . .	-	E-4	E-4
.40	Adjustments of:			
	a. Drafting instruments and equipment . . . . .	-	E-5	E-5
	b. Surveying instruments and equipment and materials testing equipment . . . . .	-	-	E-5
.41	Procedures for repairing or obtaining repairs to, and replacement of, surveying, drafting, and materials testing equipment . . . . .	-	E-5	E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EA EAD EAS

C. TOPOGRAPHIC, LAND, AND CONSTRUCTION SURVEYING AND DRAFTING

1.00 Practical Factors

.01	Use reference handbooks and Military Standards related to construction work . . . . .	-	E-4	E-4
.02	Measure horizontal distance by taping and stadia . . . . .	-	-	E-4
.36	Measure vertical distance by direct and indirect leveling . . . . .	-	E-5	E-4
.37	Run a surveyor's compass . . . . .	-	E-5	E-4
.38	Make and reproduce from field notes or verbal instructions:			
	a. Contours, cross sections, and profiles . . . . .	-	E-4	E-4
	b. Topographic drawings . . . . .	-	E-5	E-5
	c. Maps and construction layouts for advanced bases and airfields . . . . .	E-6	-	-
.39	Land Surveys:			
	a. Set and mark monuments and reference marks . . . . .	-	-	E-4
	b. Identify corners, monuments, and reference marks . . . . .	-	-	E-5
.40	Make topographic surveys:			
	a. Run and close traverses; use bearings, azimuths, and angles. . . . .	-	-	E-5
	b. Locate details and relief using transit, stadia, and plane table . . . . .	-	-	E-5
	c. Establish a bench mark net . . . . .	-	-	E-5
.41	Make computations from and use utility, earthwork, paving, and building construction specifications and plans . . . . .	-	E-5	E-5
.42	Establish triangulation net for construction control points . . . . .	-	-	E-5
.43	Make and reproduce mechanical, electrical, architectural, and structural drawings . . . . .	-	E-5	-
.59	Construction surveys:			
	a. Layout horizontal and vertical curves . . . . .	-	-	E-5
	b. Perform surveys necessary for the location and construction of lines of transportation or communication, structures, and underground utilities . . . . .	E-6	-	-
.60	Make the following layouts:			
	a. Mechanisms, such as belts and pulleys, and systems of plumbing, heating, and ventilating . . . . .	E-6	-	-
	b. Architectural and structural . . . . .	E-6	-	-
	c. Electrical systems and equipment . . . . .	E-6	-	-

2.00 Examination Factors

.39	Forms, types, and methods of keeping field notes . . . . .	-	E-5	E-4
.40	Elements of the following as related to drafting: mechanical and electrical systems, topography, hydrography, and building construction . . . . .	-	E-5	-
.41	Elements of timber, steel, and concrete structures (materials and methods assembly) . . . . .	-	E-5	-
.42	Methods of laying out control grids in field and office . . . . .	-	E-5	E-5
.59	Methods of making:			
	a. Topographic and construction surveys . . . . .	-	-	E-5
	b. Land surveys . . . . .	E-6	-	-
.60	Methods and procedures for making and plotting beach surveys . . . . .	E-6	-	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EA EAD EAS

D. TRIANGULATION AND FIELD ASTRONOMY

1.00 Practical Factors

.60	Set up and keep field notes for sun and star observations. . . . .	E-6	-	-
.80	Make sun and star observations for bearing or azimuth, latitude, and longitude . . . . .	E-7	-	-

2.00 Examination Factors

.60	Sources and limits of error in triangulation . . . . .	E-6	-	-
.80	Classification and types of triangulation systems . . . . .	E-7	-	-
.81	Triangulation stations and signals . . . . .	E-7	-	-
.82	Elements of a triangulation survey . . . . .	E-7	-	-
.83	Principles of field astronomy . . . . .	E-7	-	-

E. MATHEMATICS

1.00 Practical Factors

.01	Make arithmetical computations, using fractions, decimals, square root, ratio and proportion, reciprocals, and percentages . . . . .	-	E-4	E-4
.02	Make computations of volumes and areas, using formulas and constants supplied from handbooks . . . . .	-	E-4	E-4
.03	Operate and make computations with a slide rule, calculator, and planimeter . . . . .	-	E-4	E-4
.04	Use trigonometric and logarithmic tables . . . . .	-	E-4	E-4
.39	Make conversions of:			
	a. Weights and measures . . . . .	-	E-4	E-4
	b. Time, distance, and courses . . . . .	-	E-4	E-4
	c. Electrical units (Ohm's law, watts, power, and horsepower) . . . . .	-	E-4	E-5
.40	Make surveying computations for drafting purposes including reduction of field notes and interpolation for contours . . . . .	-	E-5	E-5
.41	Make necessary computations for horizontal and vertical curves, using handbooks . . . . .	-	E-5	E-5
.42	Close a traverse and compute the area by triangles, coordinates, and double-meridian-distance . . . . .	-	E-5	E-5
.60	Make office computations for estimating earthwork quantities from cut and fill data, using handbooks . . . . .	E-6	-	-
.80	Make azimuth, latitude, longitude, and time computations from sun and star observations, using handbook . . . . .	E-7	-	-

2.00 Examination Factors

.40	Elements of plane trigonometry and basic algebra . . . . .	-	E-5	E-5
.79	Computations involved in:			
	a. Topographic and land surveying and drafting . . . . .	E-6	-	-
	b. Triangulation . . . . .	E-6	-	-
	c. Materials testing and estimating . . . . .	E-6	-	-
	d. Field astronomy . . . . .	E-7	-	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EA EAD EAS

F. PLANNING AND ESTIMATING

1.00 Practical Factors

.40	Prepare material requirements from construction drawings and specifications for elementary structures, such as a one-car garage . . . . .	-	E-5	E-5
.41	Record labor, equipment, and material utilization . . . . .	-	E-5	E-5
.58	Prepare the following reports:			
	a. Progress and performance . . . . .	-	E-5	E-5
	b. Equipment usage . . . . .	E-6	-	-
	c. Technical ("as built") . . . . .	E-6	-	-
	d. Completion (interim and terminal) . . . . .	E-7	-	-
.59	Use and interpret:			
	a. Material status reports . . . . .	-	E-5	E-5
	b. Shipping manifests and packing lists . . . . .	E-6	-	-
	c. Financial reports . . . . .	E-7	-	-
.60	Determine manpower and equipment requirements for construction jobs from standard tables and publications . . . . .	E-6	-	-
.61	Coordinate the preparation of material requirements from construction drawings . . . . .	E-6	-	-
.80	Utilize labor estimates and equipment requirements to establish labor force and equipment production schedules . . . . .	E-7	-	-
.81	Determine material delivery schedules (material echeloning) . . . . .	E-7	-	-
.82	Evaluate project progress using construction supervisors' reports . . . . .	E-7	-	-

2.00 Examination Factors

.01	Standard material specifications, Navy, and Federal Supply Catalog Systems, and construction material nomenclature . . . . .	-	E-4	E-4
.02	Use and purpose of Management Reports and Records . . . . .	-	E-5	E-5
.40	General methods and sequence of construction . . . . .	-	E-5	E-5
.41	Purpose and use of material waste allowance . . . . .	-	E-5	E-5
.60	Use of performance norms . . . . .	E-6	-	-
.61	Elements of advance base planning . . . . .	E-6	-	-
.62	Methods and procedures for rescheduling of production (job compression) . . . . .	E-6	-	-
.63	Relationship of indirect or overhead labor to direct labor . . . . .	E-6	-	-

G. QUALITY CONTROL

1.00 Practical Factors

.37	Perform tests on soils and aggregate:			
	a. Mechanical analysis, density (laboratory and field), moisture content and specific gravity . . . . .	-	E-5	E-4
	b. Atterberg limits . . . . .	E-6	-	-

QUALIFICATIONS FOR ADVANCEMENT

G. QUALITY CONTROL - Continued

Required for  
Advancement to  
EA EAD EAS

1.00 Practical Factors - Continued

- .38 Concrete testing:
  - a. Prepare concrete cylinder and beams for strength analysis . . - E-4 E-4
  - b. Perform slump test . . . . . - E-5 E-4
  - c. Test standard cylinders for compressive strength . . . . . - - E-5
  - d. Test standard beams for flexural strength . . . . . E-6 - -
- .39 Bituminous testing:
  - a. Prepare standard samples from plant and pavement for testing purposes . . . . . - E-4 E-4
  - b. Perform standard penetration tests . . . . . - - E-5
  - c. Test asphalt mix to determine optimum asphalt content . . . . E-6 - -
  - d. Perform the complete Marshall test . . . . . E-6 - -
- .80 Classify soil samples . . . . . E-7 - -

2.00 Examination Factors

- .40 Effects of water-cement ratio, aggregate size, various cements, air entraining and curing methods on ultimate strength of concrete . . . . . - E-5 E-5
- .60 Methods used to conduct basic soil surveys . . . . . E-6 - -
- .61 Use and characteristics of commonly used bituminous materials and asphalt paving mixes . . . . . E-6 - -

H. NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) WARFARE DEFENSE

1.00 Practical Factors

- .40 Operate Geiger-Mueller and ionization-type radiac survey meters . - E-5 E-5
- .41 Read and charge currently approved types of radiac dosimeters . . - E-5 E-5
- .60 Describe control central procedures for recording information concerning extent and degree of contamination from Nuclear, Biological, and Chemical warfare . . . . . E-6 - -
- .80 Supervise and instruct personnel of a survey and monitoring party. E-7 - -

2.00 Examination Factors

- .01 Kinds of nuclear radiation . . . . . - E-4 E-4
- .40 Use of Geiger-Mueller and ionization-type survey instruments; units of measure for radiation; reading and recording findings . . - E-5 E-5
- .41 Purpose and use of pocket dosimeter and film badges . . . . . - E-5 E-5
- .60 Detection and monitoring of nuclear and chemical warfare agents by observation and use of detector devices . . . . . E-6 - -
- .61 Methods of nuclear radiation monitoring and survey; rapid survey, detailed survey, and supplementary and personnel monitoring . . . E-6 - -

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
EA EAD EAS

**I. DEFENSIVE TACTICS**

**1.00 Practical Factors**

.01	Perform duties of a fire team leader and maneuver fire team into formation using combat hand and arm signals . . . . .	-	E-4	E-4
.02	Demonstrate use of protective measures such as entrenchment, cover, and concealment . . . . .	-	E-4	E-4
.03	Utilize map and compass for locating objects, points and elevations, and interpret signs and symbols used in military maps . . .	-	E-4	E-4
.04	Operate communication equipment for intracompany communication . .	-	E-4	E-4
.39	Instruct personnel in duties at the following levels:			
a.	Fire team . . . . .	-	E-4	E-4
b.	Squad . . . . .	-	E-5	E-5
c.	Platoon . . . . .	E-6	-	-
d.	Company . . . . .	E-7	-	-
.40	Perform duties of a squad leader and platoon guide . . . . .	-	E-5	E-5
.41	Post and instruct perimeter guards . . . . .	-	E-5	E-5
.42	Perform duties of an assistant to the squad leader in scouting and patrolling missions . . . . .	-	E-5	E-5
.43	Prepare rough maps, field sketches, and overlays . . . . .	-	E-5	E-5
.60	Direct fire of support weapons pertaining to a platoon . . . . .	E-6	-	-
.61	Supervise patrolling and scouting missions . . . . .	E-6	-	-
.80	Perform duties of a platoon commander . . . . .	E-7	-	-
.81	Assist in formulating plans of action for a company and in operations of a company command post . . . . .	E-7	-	-

**2.00 Examination Factors**

.01	Types and uses of ammunition used by the battalion . . . . .	-	E-4	E-4
.02	Field techniques for individual and group protection in NBC defense . . . . .	-	E-4	E-4
.40	Elements of field sanitation . . . . .	-	E-5	E-5
.60	Battalion defense organization . . . . .	E-6	-	-
.61	Methods of assigning field of fire, general target areas, or types of targets . . . . .	E-6	-	-

**J. SAFETY**

**1.00 Practical Factors**

.40	Initiate and complete current safety and accident report forms . .	-	E-5	E-5
.80	Organize and administer a safety program . . . . .	E-7	-	-

**2.00 Examination Factors**

.01	Safety precautions to be observed in Engineering Aid work and while working in and around construction sites . . . . .	-	E-4	E-4
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QUALIFICATIONS FOR ADVANCEMENT

K. ORGANIZATION AND SUPERVISION

Required for  
Advancement to  
EA EAD EAS

1.00 Practical Factors

- .01 File drawings, tracings, prints, publications, and drafting room data . . . . . - E-4 E-4
- .40 Prepare progress reports, records, and charts of construction operations . . . . . - E-5 E-5
- .60 Perform the duties of a drafting room supervisor, chief of party, and head of planning and estimating or quality control section . . . . . E-6 - -
- .61 Edit drawings, maps, and charts for accuracy, workmanship, neatness, and conformity to accepted drafting methods . . . . . E-6 - -
- .62 Prepare manpower, equipment, and time requirements for survey field parties, drafting room, planning and estimating, and quality control projects . . . . . E-6 - -
- .80 Conduct a technical training program for personnel engaged in surveying, drafting, and materials testing and estimating. . . . . E-7 - -

2.00 Examination Factors

- .60 Principles and techniques of supervision and job control . . . . . E-6 - -



**EQUIPMENT OPERATOR (EO)**

**EMERGENCY RATING (PO1 and CP0)**

**SCOPE**

Equipment Operators plan, supervise, and perform tasks involving employment of automotive, materials-handling, and construction equipment; control deployment and use of materials-handling, hauling, construction, earthmoving, quarrying, and roadbuilding equipment; direct and coordinate efforts of individuals and crews in execution of construction, earthmoving, roadbuilding, and asphalt-paving assignments; maintain records and reports on mobile and stationary equipment used; and organize and supervise automotive and construction equipment pools.

**EMERGENCY RATINGS (PO3 and PO2)**

**SCOPES**

**EQUIPMENT OPERATOR H (Hauling) - EOH**

Equipment Operators (H) operate and service automotive, materials-handling, and paving equipment, and stationary processing plants; transport personnel and materials, perform operator's service checks on such vehicles as buses, trucks, semitrailers, asphalt-paving equipment, and forklifts; operate asphalt plants and rock-crushing plants; dispatch and maintain required records for automotive equipment.

**EQUIPMENT OPERATOR N (Construction Equipment) - EON**

Equipment Operators (N) operate and service construction and earthmoving equipment; read and follow grade stakes in excavating, filling, and grading areas to specifications; operate shovels and cranes in loading, lifting, and dredging; adapt cable assemblies and change attachments on equipment; and maintain required records on assigned equipment.

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
EO    EOH    EON

**A. HAULING AND MATERIALS-HANDLING**

**1.00 Practical Factors**

- |     |   |   |     |     |
|-----|---|---|-----|-----|
| .39 | Operate and perform prescribed operator's service checks on:  |   |     |     |
| a.  | Light automotive vehicles . . . . .   | - | E-4 | E-4 |
| b.  | Trucks, including cargo trucks, dump trucks, tractors,<br>and semi-trailers . . . . .   | - | E-4 | -   |
| c.  | Auxiliary hauling equipment, such as winches, dump hoists,<br>and tank truck pumps . . . . .  | - | E-4 | -   |
| d.  | Dock mules and forklifts . . . . .  | - | E-4 | -   |
| e.  | Buses and personnel vans (Must be 21 years of age. This<br>qualification item will be held in abeyance until age 21<br>is reached.) . . . . . | - | E-4 | -   |
| f.  | Dump trucks over 10-cubic yard capacity, and special<br>vehicles such as lumber carrier and transit mix trucks . . . . .                      | - | E-5 | -   |

**2.00 Examination Factors**

- |     |  |   |     |     |
|-----|--|---|-----|-----|
| .01 | Principles of operation of 2- and 4-stroke-cycle diesel<br>engine and 4-stroke-cycle gasoline engine . . . . . | - | E-4 | E-4 |
|-----|--|---|-----|-----|

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
EO EOH EON

**A. HAULING AND MATERIALS-HANDLING - Continued**

**2.00 Examination Factors - Continued**

.02	Starting and stopping procedures of different types of gasoline and diesel engines . . . . .	-	E-4	E-4
.03	Types, uses, and care of wire rope . . . . .	-	E-4	E-4
.04	Navy designation of lubricants and fuels (Mogas, Avgas) used in automotive and materials-handling and construction equipment. .	-	E-4	E-4
.05	Mechanical limitations in loading, moving, and braking materials-handling and hauling equipment . . . . .	-	E-4	-
.06	Functions and major parts of hauling, materials-handling, and weight-handling equipment . . . . .	-	E-4	-
.07	Commonly used makes and types of trucks, cargo and dump trucks through 5 tons, buses and truck tractors, light vehicles, and materials-handling equipment . . . . .	-	E-4	-
.08	Use of slings, nets, box hooks, and pallet slings . . . . .	-	-	E-4
.09	Effective payload, maximum payload, average rate of operation and gross limits of hauling and materials-handling equipment . . .	-	E-4	-

**B. CONSTRUCTION EQUIPMENT**

**1.00 Practical Factors**

.01	Read and interpret grade stakes in making cuts and fills . . . . .	-	E-4	E-4
.02	Recognize standard signals for directing equipment operators . . .	-	E-4	E-4
.38	Operate and perform prescribed operator's lubrication and service checks on:			
	a. Tractors, wheel, or crawler in pulling operations . . . . .	-	-	E-4
	b. Tractors, wheel, or crawler with attachments, such as dozer blade and front-end loader . . . . .	-	-	E-4
	c. Scrapers, crawler tractor-drawn . . . . .	-	-	E-4
	d. Cranes, crawler or wheel, mounted in hoisting operations . . .	-	-	E-4
	e. Scrapers, rubber-tired tractor-drawn . . . . .	-	-	E-4
	f. Ditching machine, wheel, ladder, or vertical boom type . . . . .	-	-	E-4
	g. Air compressors . . . . .	-	-	E-4
	h. Graders, motorized . . . . .	-	-	E-5
	i. Crane, rigged as clamshell, dragline, shovel, or backhoe . . .	-	-	E-5
	j. Crane, rigged as piledriver . . . . .	E-6	-	-
.39	Change attachments and adapt cable assemblies on:			
	a. Tractors and tractor-drawn scrapers and cranes for hoisting . . . . .	-	-	E-4
	b. Clamshell, dragline, shovel, and backhoe attachment . . . . .	-	-	E-5
	c. Crane rigged as piledriver . . . . .	-	-	E-5
.40	Use leveling instruments to check grades . . . . .	-	-	E-5

**2.00 Examination Factors**

.01	Makes, types, functions, and major parts of cranes and attachments, ditchers, compaction equipment, graders, tractors, and scrapers . . . . .	-	-	E-4
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QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EO EOH EON

B. CONSTRUCTION EQUIPMENT - Continued

2.00 Examination Factors - Continued

.02	Mechanical limitations in loading, digging, moving, swinging, and lifting with construction equipment . . . . .	-	-	E-4
.40	Effective payload, maximum payload, average rate of operation and gross limits of construction equipment . . . . .	-	-	E-5
.60	Types of piles; methods and rate of driving piles in different types of soils . . . . .	E-6	-	-

C. QUARRYING, CRUSHING, BATCHING, AND PAVING

1.00 Practical Factors

.01	Serve as crew member in asphalt paving; quarrying and rock crushing; and asphalt batching . . . . .	-	E-4	-
.39	Operate and perform prescribed operator's lubrication and service checks on:			
a.	Self-propelled road rollers . . . . .	-	E-4	-
b.	Asphalt paver and asphalt distributor, and quarrying equipment . . . . .	-	E-5	-
c.	Asphalt plant, portable or stationary and allied equipment; rock crushing equipment . . . . .	E-6	-	-

2.00 Examination Factors

.40	Laying procedure, maintenance, and repair of asphalt pavement. . .	-	E-5	-
.60	Principles of quarry operation . . . . .	E-6	-	-
.61	Principles of mixing asphalt . . . . .	E-6	-	-

D. SAFETY

1.00 Practical Factors

None.

2.00 Examination Factors

.01	Safety precautions to be observed in operating and servicing:			
a.	Automotive and materials-handling equipment . . . . .	-	E-4	-
b.	Construction equipment . . . . .	-	-	E-4
c.	Rock crushing, batching, and paving equipment . . . . .	-	E-4	-
.02	Safe practices for quarry operations . . . . .	-	E-4	E-4
.03	Safety precautions to be observed in handling fuels and lubricants . . . . .	-	E-4	E-4
.04	Use of portable firefighting equipment for extinguishing petroleum and electric fires . . . . .	-	E-4	E-4

QUALIFICATIONS FOR ADVANCEMENT

E. FOREMANSHIP

Required for  
Advancement to  
EO EOH EON

1.00 Practical Factors

.40	Dispatch and keep required records . . . . .	-	E-5	E-5
.60	Prepare progress reports, job orders, material requisitions, and required transportation requests . . . . .	E-6	-	-
.61	Supervise and train personnel engaged in hauling and materials- handling, earthwork, quarrying, crushing, batching, and paving operations . . . . .	E-6	-	-
.80	Make equipment and material estimates from drawings, sketches, and specifications . . . . .	E-7	-	-
.81	Supervise and perform duties of excavation and grade foreman on earthmoving projects . . . . .	E-7	-	-
.82	Conduct training programs to qualify personnel for advancement in rating, including cross-training of personnel for advance- ment to the EO rating . . . . .	E-7	-	-
.83	Control site deployment of materials and equipment . . . . .	E-7	-	-
.84	Train individuals and drill crews in safe and expeditious execution of assigned tasks . . . . .	E-7	-	-
.85	Direct and coordinate composition and efforts of crews . . . . .	E-7	-	-
.86	Direct general job operations involving hauling, earthwork, plant operation, and asphalt paving . . . . .	E-7	-	-
.87	Organize and supervise a construction equipment pool, including crane testing and calibration procedures; and a transportation pool, including driver qualification and licensing procedures. . .	E-7	-	-

2.00 Examination Factors

.60	Principles and techniques of supervision and job control . . . . .	E-6	-	-
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F. DEFENSIVE TACTICS

.01	Perform duties of a fire team leader . . . . .	-	E-4	E-4
.02	Maneuver fire team into formation using combat hand and arm signals . . . . .	-	E-4	E-4
.03	Demonstrate use of protective measures such as entrenchment, cover, and concealment . . . . .	-	E-4	E-4
.04	Use map and compass for locating objects, points, and elevations .	-	E-4	E-4
.05	Interpret signs and symbols used in military maps . . . . .	-	E-4	E-4
.06	Operate communication equipment for intracompany communication .	-	E-4	E-4
.39	Instruct personnel in duties at the following levels:			
	a. Fire team . . . . .	-	E-4	E-4
	b. Squad . . . . .	-	E-5	E-5
	c. Platoon . . . . .	E-6	-	-
	d. Company . . . . .	E-7	-	-
.40	Perform duties of a squad leader and platoon guide . . . . .	-	E-5	E-5
.41	Post and instruct perimeter guards . . . . .	-	E-5	E-5
.42	Perform duties of an assistant to the platoon or squad leader in scouting and patrolling missions . . . . .	-	E-5	E-5
.43	Prepare rough maps, field sketches, and overlays . . . . .	-	E-5	E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
EO EOH EON

F. DEFENSIVE TACTICS - Continued

1.00 Practical Factors - Continued

.60	Direct fire of support weapons pertaining to a platoon . . . . .	E-6	-	-
.61	Supervise patrolling and scouting missions . . . . .	E-6	-	-
.80	Perform duties of a platoon commander . . . . .	E-7	-	-
.81	Assist in formulating plans of action for a company . . . . .	E-7	-	-
.82	Assist in operations of a company command post . . . . .	E-7	-	-

2.00 Examination Factors

.01	Types and uses of ammunition used by the battalion . . . . .	-	E-4	E-4
.02	Field techniques for individual and group protection in NBC warfare . . . . .	-	E-4	E-4
.40	Elements of field sanitation . . . . .	-	E-5	E-5
.41	Battalion defense organization . . . . .	-	E-5	E-5
.60	Methods of assigning field of fire, general target areas, or types of targets . . . . .	E-6	-	-
.61	Types and uses of infantry weapons in accordance with current construction battalion allowance . . . . .	E-6	-	-

G. NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) WARFARE DEFENSE

1.00 Practical Factors

None.

2.00 Examination Factors

.01	Use of approved decontaminants for area and building decontamination . . . . .	-	E-4	E-4
.40	Methods of decontamination of areas and buildings and equip- ment contaminated by nuclear or chemical warfare agents . . . . .	-	E-5	E-5

STEELWORKER (SW)

EMERGENCY RATING (PO1 and CPO)

SCOPE

Steelworkers plan, supervise and perform tasks directly related to fabrication, erection and dismantling of metal and metal-girded structures; control site deployment of materials and equipment; direct and coordinate composition and efforts of crews who fabricate, assemble, erect, position and join skeletal and complete units and sections; and train and drill individuals and crews in safe and expeditious execution of fabrication and erection tasks.

EMERGENCY RATINGS (PO3 and PO2)

SCOPES

STEELWORKER E (Erector) - SWE

Steelworkers (E) erect and dismantle structures such as steel towers, tanks, pontoons, metal-girded utilities, buildings and prefabs; assemble and rig construction equipment (exclusive of mobile construction equipment), construct staging and platforms; erect, position and connect structural beams and fabricated sections; and position and anchor reinforcing steel, tubes and ducts.

STEELWORKER F (Fabricator) - SWF

Steelworkers (F) form, condition and join units and sections of ferrous and nonferrous metals and sheet metal used in field construction and in maintenance of construction equipment; lay out, cut, form, build up, hard-face, heattreat, braze and weld; and shape, position, anchor and rivet sheet metal ducts and panels and reinforcing steel.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SWE SWF SW

A. HOISTING EQUIPMENT, TACKLE, RIGGING AND WORKING PLATFORMS

1.00 Practical Factors

.01	Splice fiber line and wire rope. . . . .	E-4	-	-
.02	Reeve common block and tackle arrangements . . . . .	E-4	-	-
.03	Serve as crew member in field rigging. . . . .	E-4	-	-
.40	Use blocks and tackles, hand, derrick and truck winches, hoists, jacks, rollers and cable slings to move heavy objects; erect scaffolding; erect and use "A" frames, gin poles and derricks. . . . .	E-5	-	-
.41	Rig wire rope, using hot sockets, clips and other attachments. . . . .	E-5	-	-
.42	Direct movement of cranes and other hoisting devices in moving or positioning heavy objects. . . . .	E-5	-	-
.43	Make wire rope slings and fiber line slings. . . . .	E-5	-	-

2.00 Examination Factors

.01	Types and uses of fiber line and wire rope; uses of various wire-rope and fiber-line splices; size, care and maintenance of wire rope and fiber line; uses of fiber-line knots, bends and hitches. . . . .	E-4	-	-
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QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SWE SWF SW

A. HOISTING EQUIPMENT, TACKLE, RIGGING AND WORKING PLATFORMS - Continued

2.00 Examination Factors - Continued

.02	Erection and uses of common types of hoisting rigs, scaffolds and guys; mechanical advantage of common block and tackle arrangements .	E-4	-	-
.03	Methods and techniques for directing operators of hoisting devices, using standard hand signals. . . . .	E-4	-	-

B. WELDING

1.00 Practical Factors

.39	Perform oxyacetylene and electric arc welding:			
a.	In flat and vertical positions on steel. . . . .	E-5	E-4	-
b.	On all shapes of ferrous metals in all positions . . . . .	-	E-5	-
c.	On all shapes of aluminum, stainless steel and other commonly used nonferrous metals in all positions. . . . .	-	E-5	-
.40	Build-up hard-face worn metal parts. . . . .	-	E-5	-

2.00 Examination Factors

.01	Identification of compressed gas cylinders by standard markings. . .	E-4	E-4	-
.38	Types, sizes, strength and uses of various welds . . . . .	E-5	E-4	-
.39	Types and uses of electrodes, filler rods and fluxes for welding, brazing and soldering. . . . .	E-5	E-4	-
.40	Types and applications of welded joints. . . . .	-	E-5	-
.41	Principles and methods of maintaining and adjusting arc and oxyacetylene welding and cutting equipment, including manifold gas distribution systems . . . . .	E-5	E-5	-
.42	Methods of controlling expansion during welding, preheating and postheating, skip welding, spacing and heat transfer . . . . .	-	E-5	-

C. METAL WORKING AND FABRICATION

1.00 Practical Factors

.01	Cut metal with oxyacetylene torch. . . . .	E-4	E-4	-
.02	Serve as crew member in:			
a.	Laying out and fabricating steel structures. . . . .	-	E-4	-
b.	Treating and working metal shapes. . . . .	-	E-4	-
.03	Lay out and fabricate elementary designs and shapes in:			
a.	Sheet metal. . . . .	-	E-4	-
b.	Structural members, light and heavy. . . . .	-	E-4	-
.04	Compute mathematically, basic problems in metal layout and construction	-	E-4	-
.40	Lay out and fabricate metal structures, using welding, brazing, soldering and riveting processes . . . . .	-	E-5	-
.41	Apply simple heat-treating process to metal, such as pre- and post-heat, annealing, tempering and hardening . . . . .	-	E-5	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SWE SWF SW

C. METAL WORKING AND FABRICATION - Continued

1.00 Practical Factors - Continued

.60 Develop patterns and templates for metal fabrication . . . . . - - E-6

2.00 Examination Factors

.01 Principles and techniques of cutting metals with oxyacetylene  
equipment. . . . . E-4 E-4 -  
.60 Methods and procedures for laying out and fabricating metal  
sheets, plates and shapes in shop and field. . . . . - - E-6  
.61 Shop and field methods of treating metals; principles of metal  
testing for tensile strength and hardness. . . . . - - E-6  
.62 Shop and field methods for testing strength of wire rope and fiber  
line . . . . . - - E-6  
.63 Physical and chemical properties of steel. . . . . - - E-6

D. STEEL PLACEMENT AND ERECTION

1.00 Practical Factors

.01 Serve as crew member in:  
a. Erecting and dismantling steel structures. . . . . E-4 - -  
b. Bending, placing and tying reinforcing steel . . . . . E-4 E-4 -  
.02 Use Federal Standard Stock Catalog Color Code Chart to identify  
steel, aluminum, stainless steel and cast iron . . . . . E-4 E-4 -  
.40 Bend, place and tie reinforcing steel in accordance with plans and  
specifications . . . . . E-5 E-5 -  
.41 Erect and dismantle steel structures such as towers, buildings,  
pontoons and tanks; climb and work in raising gangs as a connector  
or tag man . . . . . E-5 - -  
.60 Set up and operate a reinforcing steelbending shop . . . . . - - E-6

2.00 Examination Factors

.01 Basic types and shapes of structural and reinforcing steel . . . . . E-4 E-4 -  
.02 Compute mathematically basic problems in steel erection and  
construction . . . . . E-4 - -  
.40 Methods and procedures for assembling prefabricated structures  
such as pontoons, towers, tanks and buildings. . . . . E-5 - -

E. HANDTOOLS

1.00 Practical Factors

.01 Select and use handtools for:  
a. Loft and field rigging . . . . . E-4 - -  
b. Erecting and dismantling steel structures. . . . . E-4 - -  
c. Metal layout and fabrication . . . . . - E-4 -  
d. Bending, placing and tying reinforcing steel . . . . . E-4 E-4 -



**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
SWE SWF SW

**E. HANDTOOLS - Continued**

**2.00 Examination Factors**

None.

**F. DRAWINGS AND SKETCHES**

**1.00 Practical Factors**

.01	Read and work from drawings and sketches . . . . .	E-4	E-4	-
.40	Read and interpret prints, drawings, specifications and sketches . .	E-5	E-5	-
.60	Make sketches for rigging, metal structures, reinforcing steel, and metal fabrication. . . . .	-	-	E-6

**2.00 Examination Factors**

None.

**G. SAFETY PRECAUTIONS**

**1.00 Practical Factors**

None.

**2.00 Examination Factors**

.01	Safety precautions to be observed in rigging and erection, welding and fabrication. . . . .	E-4	E-4	-
.40	Strengths, safe working loads and safety factors for fiber line and wire rope. . . . .	E-5	-	-

**H. FOREMANSHIP**

**1.00 Practical Factors**

.60	Prepare progress reports, job orders and equipment and material requisitions . . . . .	-	-	E-6
.61	Make equipment and material estimates from drawings, sketches and specifications . . . . .	-	-	E-6
.62	Supervise and train personnel engaged in rigging, erection and fabrication. . . . .	-	-	E-6
.80	Conduct training programs to qualify personnel for advancement in rating, including cross-training of personnel for advancement to the SW rating. . . . .	-	-	E-7
.81	Control site deployment of materials and equipment . . . . .	-	-	E-7
.82	Train individuals and drill crews in safe and expeditious execution of assigned tasks. . . . .	-	-	E-7
.83	Direct and coordinate composition and efforts of crews . . . . .	-	-	E-7
.84	Direct general job operations involving rigging, erection and fabrication. . . . .	-	-	E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
SWE SWF SW

H. FOREMANSHIP - Continued

2.00 Examination Factors

- .60 Principles and techniques of supervision and job control . . . . . - - E-6
- .80 Methods of visual inspection of welds and fabricated metal structures - - E-7

I. DEFENSIVE TACTICS

1.00 Practical Factors

- .01 Perform duties of a fire team leader . . . . . E-4 E-4 -
- .02 Maneuver fire team into formation using combat hand and arm signals. E-4 E-4 -
- .03 Demonstrate use of protective measures such as entrenchment, cover and concealment. . . . . E-4 E-4 -
- .04 Utilize map and compass for locating objects, points and elevations. E-4 E-4 -
- .05 Interpret signs and symbols used in military maps. . . . . E-4 E-4 -
- .06 Operate communication equipment for intracompany communication . . . E-4 E-4 -
- .39 Instruct personnel in duties at the following levels:
  - a. Fire team. . . . . E-4 E-4 -
  - b. Squad. . . . . E-5 E-5 -
  - c. Platoon. . . . . - - E-6
  - d. Company. . . . . - - E-7
- .40 Perform duties of a squad leader and platoon guide . . . . . E-5 E-5 -
- .41 Post and instruct perimeter guards . . . . . E-5 E-5 -
- .42 Perform duties of an assistant to the squad leader in scouting and patrolling missions. . . . . E-5 E-5 -
- .43 Prepare rough maps, field sketches and overlays. . . . . E-5 E-5 -
- .60 Direct fire of support weapons pertaining to platoon . . . . . - - E-6
- .61 Supervise patrolling and scouting missions . . . . . - - E-6
- .80 Perform duties of a platoon commander. . . . . - - E-7
- .81 Assist in formulating plans of action for a company. . . . . - - E-7
- .82 Assist in operations of a company command post . . . . . - - E-7

2.00 Examination Factors

- .01 Types and uses of ammunition used by the battalion . . . . . E-4 E-4 -
- .02 Field techniques for individual and group protection in NBC warfare. E-4 E-4 -
- .40 Elements of field sanitation . . . . . E-5 E-5 -
- .41 Battalion defense organization . . . . . E-5 E-5 -
- .60 Methods of assigning field or fire, general target areas or types of targets. . . . . - - E-6

**UTILITIESMAN (UT)**

**EMERGENCY RATING (FO1 and CPO)**

**SCOPE**

Utilitiesmen plan, supervise, and perform tasks as prescribed by drawings and specifications involved in installation, maintenance, and repair of heating, steam, fuels, water distribution and treatment systems, air-conditioning and refrigeration equipment, and sewage disposal facilities; schedule and evaluate installation and operational tasks and routines; oversee and perform tasks in procurement and issue of supplies and repair parts; prepare records and reports; draw or alter schematics; and train assistants in installation, operation, and repair procedures and techniques.

**EMERGENCY RATINGS (FO3 and PO2)**

**SCOPES**

**UTILITIESMAN A (Air Conditioning) - UTA**

Utilitiesmen (A) install, operate, service, and repair air-conditioning and refrigeration equipment; maintain required suction and discharge pressures on compressors and pumps; repack valves; fit pipe; inspect refrigeration systems for leaks; purge air and charge refrigeration systems; clean and defrost refrigeration coils; and regulate temperatures of refrigerators, cold-storage spaces, and air-cooled compartments.

**UTILITIESMAN B (Boilerman) - UTB**

Utilitiesmen (B) install, operate, service, and repair steam boilers; regulate steam pressures and fuel supply; operate related machinery and record pressures of steam, fuel, oil, air, and feed water; test boiler and feed water; test boiler for leaks; clean fire and water sides; replace tubes; cut, fit, and install boiler castings and gaskets; test fuel oils; repair and calibrate gages; install and repair galley equipment.

**UTILITIESMAN P (Plumber) - UTP**

Utilitiesmen (P) assemble and install piping, equipment, and facilities to provide steam, fuels, air water, and waste disposal; cut, bend, and fit commonly used piping; make pipe joints by threading, caulking, fitting, or soldering; install fixtures, such as toilets, sinks, valves, and traps; clean and repair waste disposal and piping systems; cover pipe with insulative and protective materials.

**UTILITIESMAN W (Water and Sanitation) - UTW**

Utilitiesmen (W) install, operate, service, and repair water distillation and purification equipment and pumps; operate water supply installations and pumping stations; operate and service prime movers used to supply utilities; distill and purify water; and make chemical tests to determine safeness and potability of water.

**QUALIFICATIONS FOR ADVANCEMENT**

		Required for Advancement to				
		UT	UTA	UTB	UTP	UTW
<b>A. PLUMBING AND PIPEFITTING</b>						
1.00 Practical Factors						
.01	Cut pipe: copper, steel, cast iron, clay, and asbestos cement.	-	E-4	E-4	E-4	E-4
.02	Prepare pipes for joining: clean, ream, cut threads, flare, and swedge . . . . .	-	E-4	E-4	E-4	E-4
.03	Bend pipe and tubing; join pipe and tubing by soldering, mastics, threaded flanges, couplings, and fittings; prepare and place pipe lagging and other insulative and protective materials on piping and pressure vessels . . . . .	-	E-4	E-4	E-4	E-4

QUALIFICATIONS FOR ADVANCEMENT

A. PLUMBING AND PIPEFITTING - Continued

Required for  
Advancement to  
UT UTA UTB UTP UTW

1.00 Practical Factors - Continued

.04	Assist in laying sewer, drainage, and utilities distribution pipe to line, grade, and specification. . . . .	-	E-4	E-4	E-4	E-4
.05	Assist in checking installation and performing and interpreting results of tests to piping systems . . . . .	-	-	-	E-4	-
.40	Lay sewer, drainage, and utilities distribution pipe to grade and specification. . . . .	-	-	-	E-5	-
.41	Install plumbing and related systems in structures, including fixtures and accessories to systems . . . . .	-	-	-	E-5	-
.42	Perform and interpret results of mechanical tests used in plumbing and utilities distribution and collection systems . . . . .	-	-	-	E-5	-
.43	Inspect, repair, and maintain plumbing and utilities distribution and collection systems . . . . .	-	-	-	E-5	E-5

2.00 Examination Factors

.01	Standard color coding and markings used on shore piping systems . . . . .	-	E-4	E-4	E-4	E-4
.02	Methods of pipe and tubing identification and measurement . .	-	E-4	E-4	E-4	E-4
.40	Characteristics of types of utilities distribution and collection systems. . . . .	-	-	-	E-5	E-5
.41	Methods of installing, maintaining, and repairing low-pressure compressed air systems . . . . .	-	-	-	E-5	-

B. FURNACES, BOILERS, AND PRESSURE VESSELS

1.00 Practical Factors

.01	Clean watersides and firesides, using hand and power driven equipment, including boiling out a boiler. . . . .	-	-	E-4	-	-
.02	Perform routine boiler and feed water tests . . . . .	-	-	E-4	-	-
.03	Replace hand and manhole gaskets, gage glasses, pressure gages, and strainers. . . . .	-	-	E-4	-	-
.04	Operate, regulate, adjust, and keep operational logs for stationary steam boilers. . . . .	-	-	E-4	-	-
.40	Replace defective boiler tubes. . . . .	-	-	E-5	-	-
.41	Perform and interpret results of tests made on boilers and pressure vessels. . . . .	-	-	E-5	-	-
.42	Install and repair boiler floors, walls, and linings for steam boilers; mold and install clay on boilers . . . . .	-	-	E-5	-	-
.43	Repair steam, water, and fuel leaks on lines, fittings, and auxiliary boiler equipment, including separators, steam traps, heaters, and flow meters; repair air leakage in furnaces, castings stacks, and boiler attachment . . . . .	-	-	E-5	-	-
.44	Install and repair galley equipment such as oilfired ranges and ovens, coppers, steam kettels, steam traps, steam tables and dishwashing machines . . . . .	-	-	E-5	-	-
.60	Install stationary steam boilers and accessories in accordance with plans . . . . .	E-6	-	-	-	-
.61	Test, troubleshoot, and adjust mechanical control systems; install automatic controls and make repairs to mechanical control systems . . . . .	E-6	-	-	-	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
UT UTA UTB UTP UTW

B. FURNACES, BOILERS, AND PRESSURE VESSELS - Continued

2.00 Examination Factors

.01 Construction, parts and operating principles of steam boilers and auxiliary equipment . . . . .	-	-	E-4	-	-
.40 Classifications and tests of heating fuels and storage of fuels. . . . .	-	-	E-5	-	-
.41 Principles and methods of boiler and feed water treatment . .	-	-	E-5	-	-

C. REFRIGERATION AND AIR CONDITIONING EQUIPMENT

1.00 Practical Factors

.01 Operate, service, stand watch on, and keep operational logs for refrigeration equipment and secure refrigeration and air-conditioning equipment and systems. . . . .	-	E-4	-	-	-
.02 Make minor repairs to, and perform preventive maintenance on, refrigeration and air-conditioning equipment and systems . . . . .	-	E-4	-	-	-
.03 Perform routine tests for locating leaks of refrigerant in air-conditioning equipment . . . . .	-	E-4	-	-	-
.04 Purge air from systems; dehydrate, test, and charge refrigeration equipment with proper types of refrigerants . .	-	E-4	-	-	-
.40 Test, troubleshoot, adjust, and repair refrigeration and air-conditioning equipment, including control systems . . . .	-	E-5	-	-	-
.41 Perform and interpret results of mechanical tests used in refrigeration and air-conditioning equipment. . . . .	-	E-5	-	-	-
.42 Install refrigeration and air-conditioning equipment. . . . .	-	E-5	-	-	-
.43 Operate, service, adjust controls, maintain logs, and perform necessary tests on air-conditioning units . . . . .	-	E-5	-	-	-
.44 Install a simple electric and pneumatic control system composed of a controller, a controlled device, and a source of power . . . . .	-	E-5	-	-	-

2.00 Examination Factors

.01 Principles of refrigeration cycles; characteristics and properties of refrigerants. . . . .	-	E-4	-	-	-
.02 Purposes, construction, and operating principles of refrigeration units and their component parts, and units for year-round air-conditioning systems . . . . .	-	E-4	-	-	-
.40 Formulas and use of the psychrometric chart . . . . .	-	E-5	-	-	-

D. WATER TREATMENT AND SANITATION

1.00 Practical Factors

.01 Install, operate, and maintain water purification and distillation equipment. . . . .	-	-	-	-	E-4
.02 Perform tests and interpret results in water treatment and sanitation. . . . .	-	-	-	-	E-4
.03 Perform preventive maintenance on water distillation, distribution and purification equipment . . . . .	-	-	-	-	E-4
.40 Install and perform major repair and overhaul of water distillation and purification equipment . . . . .	-	-	-	-	E-5

2.00 Examination Factors

.01 Construction, parts, and operating principles of sewage disposal equipment. . . . .	-	-	-	-	E-4
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QUALIFICATIONS FOR ADVANCEMENT

	Required for Advancement to				
	UT	UTA	UTB	UTP	UTW
<b>D. WATER TREATMENT AND SANITATION - Continued</b>					
2.00 Examination Factors - Continued					
.40					
Techniques and procedures employed in testing and treatment of sewage . . . . .	-	-	-	-	E-5
.41					
Methods and procedures used in treatment and disposal of water contaminated by NBC warfare agents. . . . .	-	-	-	-	E-5
.42					
Water purification by filtration, sedimentation, distillation, flocculation, and chemical treatment. . . . .	-	-	-	-	E-5
.60					
Principal sources of water and comparative safeness of each . . . . .	E-6	-	-	-	-
.61					
Techniques and procedures employed in treatment plants. . . . .	E-6	-	-	-	-
<b>E. GAGES AND VALVES</b>					
1.00 Practical Factors					
.01					
Grind in or replace valve disks and seats . . . . .	-	E-4	E-4	E-4	E-4
.60					
Test, adjust, and recalibrate pressure gages. . . . .	E-6	-	-	-	-
2.00 Examination Factors					
.01					
Uses and purpose of grinding compounds. . . . .	-	E-4	E-4	E-4	E-4
.40					
Construction, parts, and operating principles of Bourdon tube-type pressure gages. . . . .	-	E-5	E-5	E-5	E-5
<b>F. PUMPS, COMPRESSORS, AND PRIME MOVERS</b>					
1.00 Practical Factors					
.01					
Operate and perform operator maintenance on prime movers commonly employed by utilitiesmen in assigned missions. . . . .	-	E-4	E-4	E-4	E-4
.02					
Operate, adjust, service, and perform preventive maintenance on pumps and compressors commonly employed by:					
a. Water supply, sanitation, and water purification. . . . .	-	-	-	-	E-4
b. Boilers . . . . .	-	-	E-4	-	-
c. Refrigeration and air-conditioning. . . . .	-	E-4	-	-	-
d. Water distribution. . . . .	-	-	-	E-4	-
.40					
Make major repairs to pumps for:					
a. Water treatment and sanitation. . . . .	-	-	-	-	E-5
b. Boilers . . . . .	-	-	E-5	-	-
c. Refrigeration and air-conditioning. . . . .	-	E-5	-	-	-
d. Water distribution. . . . .	-	-	-	E-5	-
2.00 Examination Factors					
.01					
Types of pumps; limitations and capabilities of each. . . . .	-	E-4	E-4	E-4	E-4
<b>G. TOOLS</b>					
1.00 Practical Factors					
.01					
Identify, maintain, and use hand and power tools, equipment, and materials commonly employed by utilitiesmen:					
a. Plumbing. . . . .	-	-	-	E-4	-
b. Refrigeration and air-conditioning. . . . .	-	E-4	-	-	-
c. Boilers . . . . .	-	-	E-4	-	-
d. Water treatment and sanitation. . . . .	-	-	-	-	E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
UT UTA UTB UTP UTW

G. TOOLS - Continued

2.00 Examination Factors

.01 Use and purpose of hand and power tools commonly employed  
by utilitiesmen . . . . . - E-4 E-4 E-4 E-4

H. DRAWINGS AND SKETCHES

1.00 Practical Factors

.01 Read simple working drawings and sketches . . . . . - E-4 E-4 E-4 E-4  
.40 Work from plans and specifications . . . . . - E-5 E-5 E-5 E-5  
.60 Prepare working sketches with appropriate symbols and lines . E-6 - - - -

2.00 Examination Factors

None.

I. SAFETY

1.00 Practical Factors

.01 Demonstrate techniques in the use of firefighting  
equipment . . . . . - E-4 E-4 E-4 E-4

2.00 Examination Factors

.01 Safety precautions and procedures to be observed while  
working on plumbing, refrigeration, air-conditioning,  
boilers, water treatment, and sanitation . . . . . - E-4 E-4 E-4 E-4  
.02 First-aid procedures used when exposed to refrigerants  
and toxic fuels . . . . . - E-4 E-4 E-4 E-4  
.03 Selection and use of firefighting equipment . . . . . - E-4 E-4 E-4 E-4

J. FOREMANSHIP

1.00 Practical Factors

.60 Prepare inspection and progress reports, job orders, and  
material requisitions; stow and account for repair parts . . E-6 - - - -  
.61 Make equipment and material estimates from drawings,  
sketches, and specifications . . . . . E-6 - - - -  
.62 Supervise and train personnel engaged in installation,  
operation, maintenance, and repair of plumbing, water  
and steam distribution, air-conditioning, water treatment  
and sanitation systems, and boilers . . . . . E-6 - - - -  
.80 Develop operational procedures and prepare reports for  
utility equipment and systems . . . . . E-7 - - - -  
.81 Conduct training programs to qualify personnel for  
advancement in rating including cross-training of  
personnel for advancement to UT rating . . . . . E-7 - - - -  
.82 Control site deployment of materials and equipment . . . . E-7 - - - -  
.83 Train individuals and drill crews in safe and expeditious  
execution of assigned tasks . . . . . E-7 - - - -  
.84 Direct and coordinate composition and efforts of crews . . . E-7 - - - -  
.85 Direct general job operations involving plumbing, water  
and steam distribution, air-conditioning, boilers, water  
treatment and sanitation systems . . . . . E-7 - - - -

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
UT UTA UTB UTP UTW

J. FOREMANSHIP - Continued

1.00 Practical Factors - Continued

.86 Plan, estimate, and schedule construction projects, using latest approved methods, including Critical Path Method (CPM). . . . . E-7 - - - -

2.00 Examination Factors

.60 Principles and techniques of supervision and job control. . . E-6 - - - -

K. DEFENSIVE TACTICS

1.00 Practical Factors

.01 Perform duties of a fire team leader. . . . . - E-4 E-4 E-4 E-4  
 .02 Maneuver fire teams into formations by the use of hand and arm signals . . . . . - E-4 E-4 E-4 E-4  
 .03 Demonstrate use of protective measures such as entrenchment, cover, and concealment. . . . . - E-4 E-4 E-4 E-4  
 .04 Utilize map and compass for locating objects, points, and elevations. . . . . - E-4 E-4 E-4 E-4  
 .05 Interpret signs and symbols used in military maps . . . . . - E-4 E-4 E-4 E-4  
 .06 Operate communication equipment for intracompany communication . . . . . - E-4 E-4 E-4 E-4  
 .39 Instruct personnel in duties at the following levels:  
     a. Fire team . . . . . - E-4 E-4 E-4 E-4  
     b. Squad . . . . . - E-5 E-5 E-5 E-5  
     c. Platoon . . . . . E-6 - - - -  
     d. Company . . . . . E-7 - - - -  
 .40 Perform duties of a squad leader and platoon guide. . . . . - E-5 E-5 E-5 E-5  
 .41 Post and instruct perimeter guards. . . . . - E-5 E-5 E-5 E-5  
 .42 Perform duties of an assistant to the squad leader in scouting and patrolling missions. . . . . - E-5 E-5 E-5 E-5  
 .43 Prepare rough maps, field sketches, and overlays. . . . . - E-5 E-5 E-5 E-5  
 .60 Direct fire of support weapons pertaining to a platoon. . . . E-6 - - - -  
 .61 Supervise patrolling and scouting missions. . . . . E-6 - - - -  
 .80 Perform duties of a platoon commander . . . . . E-7 - - - -  
 .81 Assist in formulating plans of action for a company . . . . . E-7 - - - -  
 .82 Assist in operations of a company command post. . . . . E-7 - - - -

2.00 Examination Factors

.01 Types and uses of ammunition used by the battalion. . . . . - E-4 E-4 E-4 E-4  
 .02 Field techniques for individual and group protection in NBC warfare . . . . . - E-4 E-4 E-4 E-4  
 .40 Elements of field sanitation. . . . . - E-5 E-5 E-5 E-5  
 .41 Battalion defense organization. . . . . - E-5 E-5 E-5 E-5  
 .60 Methods of assigning field of fire, general target areas, or types of targets . . . . . E-6 - - - -

L. NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC) WARFARE DEFENSE

1.00 Practical Factors

.40 Perform necessary tests used in detecting contamination by NBC warfare of water supply and sewage facilities . . . . . - - - - E-5

2.00 Examination Factors

.40 Technical procedures employed in obtaining samples of water supply contaminated by NBC warfare agents . . . . . - E-5 E-5 E-5 E-5





**FI**



**PS**

# **PORT SECURITY GROUP VII**

**Fire Fighter  
Port Securityman**

**FI  
PS**

**Amend. No. 2**

2. 10.1

★ PORT SECURITYMAN (PS) / FIREFIGHTER (FI)

EMERGENCY RATING

SCOPE

PORT SECURITYMAN - (PS) (PS3 through PSCM)

Port Securitymen are specialists fully qualified in the knowledge, techniques, skills, and equipment of enforcing the regulations and orders relative to the protection and security of vessels, harbors, ports, and waterfront facilities. They enforce the regulations "Explosives or Other Dangerous Articles on Board Vessels" and "Rules and Regulations for Military Explosives and Hazardous Munitions"; supervise and control the safe handling, transportation, stowage, and storage of explosives and other dangerous cargoes; in restricted areas, prevent unauthorized persons from entering upon the vessel or waterfront facility, and carefully examine all authorized persons permitted to do so. They are well versed in the field of fire inspection, prevention, detection, control, and extinguishment, and assist in combating fires on board vessels and at waterfront facilities,

EMERGENCY RATING

SCOPE

FIREFIGHTER - (FI) (FI1 through FICM)

The Firefighter is a senior petty officer specialist in the field of fire inspection, prevention, detection, control, and extinguishment. He advances from the PS rating and functions primarily in port areas on waterfront facilities and aboard merchant and naval ships and smaller craft. Firefighters are required to instruct personnel in the techniques of firefighting and to organize and train firefighting units.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PS FI

A. SECURITY OF VESSELS AND WATERFRONT FACILITIES

1.00 Practical Factors

.01	Identify credentials accepted by Commandant of the Coast Guard of persons requiring access to vessels and waterfront facilities in a restricted area and/or security zone . . . . .	E-4	-
.02	Identify dangerous cargo classes by labels and by DOT markings . . . . .	E-4	-
.03	Conduct preliminary investigations and make reports on Oil Pollution and Refuse Act violations . . . . .	E-4	-
.40	Conduct a complete waterfront safety inspection based on the requirements of a designated waterfront facility, with emphasis on fire-prevention aspects . . . . .	E-5	-
.41	Demonstrate proper handling and operation of radiax devices as related to port security . . . . .	E-5	-
.60	Instruct Port Securitymen in the performance of their duties . . . . .	E-6	-
.61	Instruct a patrol detail in the use of a night stick, service pistol, and restraining holds . . . . .	E-6	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PS FI

A. SECURITY OF VESSELS AND WATERFRONT FACILITIES - Continued

1.00 Practical Factors - Continued

- .62 Instruct personnel in the procedures for maintaining the security of a restricted area and security zone . . . . . E-6 -
- .80 Instruct personnel in methods and measures of combating sabotage . E-7 E-7

2.00 Examination Factors

- .01 Basic provisions of CG-239 and related parts of CG-299 regarding the security of vessels and waterfront facilities . . . . . E-4 -
- .02 Requirements for obtaining and use of a Port Security Card . . . . E-4 -
- .03 Purpose and duties of routine port security patrols . . . . . E-4 -
- .04 Organizational authority between the Coast Guard and other supervisory personnel (military and civilian) in the waterfront area . E-4 -
- .05 Responsibilities of government agencies and organizations on the waterfront . . . . . E-4 -
- .06 Responsibilities of civilian agencies and organizations on the waterfront . . . . . E-4 -
- .07 Basic features and characteristics of typical freight, tank, and passenger vessels . . . . . E-4 -
- .08 Basic requirements for compatible stowage of dangerous cargoes on piers . . . . . E-4 -
- .09 Names of deck tools, materials, and general shipboard and waterfront terminology . . . . . E-4 -
- .40 Basic requirements for compatible stowage of dangerous cargoes aboard vessels . . . . . E-5 -
- .60 Organization of vessel and pier inspection parties . . . . . E-6 -
- .61 Basic sabotage techniques and devices . . . . . E-6 E-6
- .80 Methods and measures of combating sabotage . . . . . E-7 E-7

B. LAW ENFORCEMENT TECHNIQUES

1.00 Practical Factors

- .01 Set up required equipment and demonstrate fingerprinting techniques E-4 -
- .02 Demonstrate approach and execution of an arrest . . . . . E-4 -
- .03 Demonstrate approach and execution of both frisk and wall searches E-4 -
- .04 Demonstrate methods of self-defense including:
  - a. Police arm bar . . . . . E-4 -
  - b. Rear arm lock . . . . . E-4 -
  - c. Neck drag . . . . . E-4 -
  - d. Front wrist take down . . . . . E-4 -
  - e. Break away . . . . . E-4 -
  - f. Come-along including wrist and finger control . . . . . E-4 -
- .05 Demonstrate use of the police baton offensively and defensively . E-4 -
- .60 Conduct a complete report of investigation . . . . . E-6 -
- .61 Employ techniques of controlling local disasters or disturbances in the waterfront area . . . . . E-6 -

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PS FI

B. LAW ENFORCEMENT TECHNIQUES - Continued

2.00 Examination Factors

- .01 Law of arrest and procedures to make a legal arrest including degree of force, such as use of small arms and police baton . . . . . E-4 -
- .02 Techniques in handling and preserving physical evidence . . . . . E-4 -
- .03 Law enforcement regulations enforced by port security units (e.g., Oil Pollution, Loadline Act) . . . . . E-4 -
- .40 Principles of observation and description . . . . . E-5 -
- .80 Authorization, limitations, and procedures under martial law as applicable to local disasters or disturbances . . . . . E-7 -

C. DANGEROUS CARGO REGULATIONS

1.00 Practical Factors

- .40 Use 46 CFR, Parts 146-149, to determine how different types of dangerous cargo are classified, labeled, stowed, and transported . . . . . E-5 -
- .60 Instruct personnel in safety precautions concerning explosives and explosives loading . . . . . E-6 -
- .80 Instruct personnel in the regulations contained in 46 CFR, Parts 146-149 . . . . . E-7 -

2.00 Examination Factors

- .40 Procedures in handling radioactive materials . . . . . E-5 -
- .41 Safety precautions concerning explosives and explosives loading . . . . . E-5 -
- .60 Knowledge of 46 CFR, Parts 146-149 . . . . . E-6 -

D. DANGEROUS CARGO STOWAGE

1.00 Practical Factors

- .40 Interpret a cargo stowage plan . . . . . E-5 -
- .41 Inspect a merchant vessel for the proper stowage of dangerous cargo, including supporting papers required (dry cargo, tankers and barges) . . . . . E-5 -
- .60 Board and inspect tankers and barges for compliance with regulations governing bulk dangerous cargoes, to include: tank vessels (46 CFR, Parts 30 through 40); certain dangerous cargoes on self-propelled vessels (46 CFR, Part 98); and certain dangerous cargoes on nonself-propelled vessels (46 CFR, Part 151) . . . . . E-6 -
- .61 Instruct and supervise personnel in duties of an explosives-loading inspector . . . . . E-6 -
- .62 Instruct personnel in working knowledge of rigging booms, receiving cargo falls, and securing guys, especially with respect to safety precautions . . . . . E-6 -
- .63 Draw up a cargo stowage plan showing the proper stowage of ammunition and explosives . . . . . E-6 -
- .80 Instruct in shoring, tomming, and tiering of all classes of dangerous cargoes . . . . . E-7 -

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PS      FI

D. DANGEROUS CARGO STOWAGE - Continued

1.00: Practical Factors - Continued

- .81 Instruct in the hand and mechanical means permitted for handling dangerous cargoes; required slings, cargo nets, trays, skipboards, pieplates, palletized units, sideboards, tongs; permitted weights of drafts; leaky containers; rough handling by longshoremen . . . . . E-7 -
- .82 Instruct personnel in stowage requirements of all classes of cargoes with respect to stowage in the same hold, in magazine compartment, on deck, between deck, and under deck . . . . . E-7 -

2.00 Examination factors

- .01 Nomenclature of cargo-vessel loading gear and related terms . . . . . E-4 -
- .02 Duties of the following members of an explosives loading detail:
  - a. Gangway watch . . . . . E-4 -
  - b. Roving deck watch . . . . . E-4 -
  - c. Roving pier watch . . . . . E-4 -
- .40 Principal hazards, characteristics, and causes of ignition or explosion of various classes of military explosives and hazardous munitions . . . . . E-5 -
- .41 Various assignments and the basic responsibilities of all the members of an explosives-loading detail . . . . . E-5 -
- .42 Cargo stowage and cargo plans . . . . . E-5 -
- .43 Methods of rigging and operating equipment for loading and off-loading liquid cargoes . . . . . E-5 -
- .60 Duties of an explosives-loading supervisor . . . . . E-6 -
- .80 Shoring, tomming, and tiering of all classes of dangerous cargoes . . . . . E-7 -
- .81 Hand and mechanical means permitted for handling dangerous cargoes; required slings, cargo nets, trays, skipboards, pieplates, palletized units, sideboards, tongs, permitted weights of drafts; leaky containers; rough handling by longshoremen . . . . . E-7 -
- .82 Stowage requirements of all classes of cargoes with respect to stowage in the same hold, in magazine compartment, on deck, between deck, and under deck . . . . . E-7 -

E. FIREFIGHTING TECHNIQUES

1.00 Practical Factors

- .01 Man the different positions of a 1-1/2" and 2-1/2" hose (i.e., nozzle man, backup man and/or safety man) . . . . . E-4 -

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PS FI

E. FIREFIGHTING TECHNIQUES - Continued

1.00 Practical Factors - Continued

- .02 Perform all evolutions with standard fire hose including:
  - a. Coupling sections . . . . . E-4 -
  - b. Make up standard loads and rolls . . . . . E-4 -
  - c. Catching the hydrant . . . . . E-4 -
  - d. Forward and reverse lays . . . . . E-4 -
  - e. Advance hoses both aloft and in ground lays . . . . . E-4 -
  - f. Standard hose carries . . . . . E-4 -
  - g. Use of standard tools, adapters, hose, ropes, couplings, wye connections, and accessories . . . . . E-4 -
- .03 Perform the following with all types of portable ladders:
  - a. Carrying ladder . . . . . E-4 -
  - b. One-, two-, and four-man raises . . . . . E-4 -
  - c. Dogging (locking) . . . . . E-4 -
  - d. Climb the ladder . . . . . E-4 -
  - e. Demonstrate the leg lock . . . . . E-4 -
  - f. Bridging . . . . . E-4 -
- .04 Describe or perform the forcible entry of locked doors and windows, using approved techniques and equipment . . . . . E-4 -
- .60 Operate unit vehicles . . . . . - E-6
- .61 Organize and conduct fire drills on military and civilian facilities . . . . . - E-6
- .62 Design fire map with pre-fire plans for area responsible . . . - E-6
- .63 Demonstrate practical hose layouts which involve long lays, relays, drafting; rig ice hydrant . . . . . - E-6
- .64 Demonstrate ability to handle all kinds of boats used for firefighting and their equipment if facilities are available . . . - E-6
- .65 Under simulated conditions, demonstrate attack on a fire on board an anchored ship and on a pier . . . . . - E-6
- .66 Compute friction loss in hose lines, back pressure, action of gravity on above-ground lays and streams . . . . . - E-6
- .67 Instruct personnel in operating characteristics and use of firefighting equipment and firefighting principles . . . . . - E-6
- .68 Instruct personnel as to fire transmission and spread . . . . - E-6
- .80 Organize fire party; deploy men and equipment in firefighting on vessels and at terminals . . . . . - E-7

2.00 Examination Factors

- .01 Hazards involved and precautions necessary to prevent excessive exposure of personnel to smoke, fire, and chemical fumes . . . E-4 -
- .02 Hazards and precautions to be observed in making a forcible entry into burning structure . . . . . E-4 -
- .03 Principal firefighting hazards to man and equipment when fighting pier fires . . . . . E-4 -
- .04 Basic construction and layout of a typical pier, including under-pier fire stops, location of alarms, sprinklers, etc . . E-4 -

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to

E. FIREFIGHTING TECHNIQUES - Continued

PS FI

2.00 Examination Factors - Continued

.05	Rule-of-thumb calculations to determine various pressures, hose nozzle sizes, and lengths and heights of hose lays in regard to:		
	a. Water flow in GPM . . . . .	E-4	-
	b. Friction loss . . . . .	E-4	-
	c. Water available in a specific area. . . . .	E-4	-
.06	Knowledge of proper inspection and operation of automatic fire doors and fusible links . . . . .	E-4	-
.07	Knowledge of common substances that <u>cannot</u> safely be extinguished by water, such as certain chemicals that react violently and dangerously with water . . . . .	E-4	-
.60	Basic operation of the following types of alarm and detection systems:		
	a. Thermostatic devices . . . . .	-	E-6
	b. Smoke detectors . . . . .	-	E-6
	c. Water flow alarms . . . . .	-	E-6
	d. Rate of rise . . . . .	-	E-6
	e. Fixed temperature . . . . .	-	E-6
.61	Ventilation procedures to be observed when fighting shipboard fires . . . . .	-	E-6
.62	Ventilation procedures to be observed when fighting structural fires . . . . .	-	E-6
.63	Understanding and knowledge of how to employ basic procedures, size-up, call help, cover exposure, confinement of fire, extinguishment, and overhaul . . . . .	-	E-6
.64	Knowledge of the general organization of firefighting unit . . . . .	-	E-6
.65	Knowledge of how to devise pre-fire plans for areas for which responsible . . . . .	-	E-6
.66	Methods of breaching walls, proper use of pulldown hook . . . . .	-	E-6
.80	Relation of various shipboard systems to the firefighting problem (power, fuel, oil, electrical, ventilation) . . . . .	-	E-7
.81	Fire-resistive construction, heavy mill, steel, reinforced concrete, etc . . . . .	-	E-7
.82	Flow and pressure test procedures for mains, hydrants, and nozzles . . . . .	-	E-7
.83	Knowledge of dust explosions . . . . .	-	E-7
.84	Emergency tactics under conflagration or fire conditions . . . . .	-	E-7

F. USE, CARE AND STOWAGE OF FIREFIGHTING EQUIPMENT

1.00 Practical Factors

.01	Operate unit's fire pumps . . . . .	E-4	-
.02	Demonstrate pump operator's standard hand signals . . . . .	E-4	-
.03	Use OBA, demand type, and hose masks . . . . .	E-4	-
.04	Using standard fire hose, demonstrate the method for producing water curtains for exposure protections . . . . .	E-4	-

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to

F. USE, CARE AND STOWAGE OF FIREFIGHTING EQUIPMENT - Continued

PS FI

1.00 Practical Factors - Continued

.40	Instruct personnel in the use of a basic piece of firefighting equipment for the performance of a specific firefighting operation . . . . .	E-5	-
.60	Demonstrate use of rescue knot, Stokes litter, and boatswain's chair in rescue . . . . .	-	E-6
.61	Replace hose couplings, use ring expander . . . . .	-	E-6
.62	Make minor repairs to nozzles, adapters, and applicators . . .	-	E-6
.63	Service and make general repairs to masks and breathing apparatus. . . . .	-	E-6
.64	Test and repair ladders. . . . .	-	E-6
.65	Supervise and train personnel in use and operating characteristics of firefighting equipment and firefighting principles .	-	E-6
.66	Instruct personnel in methods and various types of extinguishing applications (i.e., water, foam, steam, CO <sub>2</sub> ) that are best used against particular types of explosives, ammunition, other dangerous articles or substances, and combustible liquids . .	-	E-6
.67	Instruct personnel in firefighting both on vessels and at terminals . . . . .	-	E-6
.68	Instruct personnel in the basic knowledge of hull structure of various cargo vessels, including location of holds, hatches, passageways, and compartments . . . . .	-	E-6

2.00 Examination Factors

.01	Accepted techniques for applying various types of water streams and their main uses in firefighting . . . . .	E-4	-
.02	Proper care of hose and hose fittings including protection from or remedy for:		
	a. Mechanical injury . . . . .	E-4	-
	b. Heat . . . . .	E-4	-
	c. Mildew . . . . .	E-4	-
	d. Chemical contacts . . . . .	E-4	-
.03	Proper use of various extinguishing and wetting agents and how they work . . . . .	E-4	-
.04	Nomenclature and operating principles of the various types of first-aid fire extinguishers . . . . .	E-4	-
.05	Use and care of protective clothing, such as helmets, coats, boots, and gloves . . . . .	E-4	-
.60	Standard threads and replacement of couplings . . . . .	-	E-6
.61	Principles, construction, and use of fog systems . . . . .	-	E-6
.62	Service and repair of masks and breathing equipment . . . . .	-	E-6
.63	Accepted salvage procedures, care of covers, use of covers for drainage . . . . .	-	E-6
.64	Use of deluge sets, extra-high-pressure fog, fog-foam . . . . .	-	E-6
.65	General requirements for procuring, stowing, and replacing supplies and spare parts for firefighting . . . . .	-	E-6
.66	Use of oxyacetylene welding and cutting equipment . . . . .	-	E-6
.67	Basic type of fireboats and special firefighting equipment used on fireboats . . . . .	-	E-6



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PS FI

F. USE, CARE AND STOWAGE OF FIREFIGHTING EQUIPMENT - Continued

2.00 Examination Factors - Continued

.80 Firefighting both on vessels and terminals; knowledge of control and spread of fires . . . . . - E-7

G. SPRINKLERS, DETECTION, AND ALARM SYSTEMS

1.00 Practical Factors

.60 Conduct elementary operating inspection of fire detection and extinguishing systems aboard merchant vessels . . . . . E-6 E-6  
 .80 Make detailed inspections of detection, alarm, and extinguishing systems ashore . . . . . E-7 E-7  
 .81 Test water supply pressures; use pitot tubes . . . . . E-7 E-7

2.00 Examination Factors

.01 Nomenclature and operating principles of typical wet and dry pipe sprinkler systems . . . . . E-4 -  
 .60 Fog and water curtains, automatic water spray systems . . . . . E-6 E-6  
 .80 Inspection and test procedures for sprinkler systems . . . . . E-7 E-7

H. COMMUNICATIONS

1.00 Practical Factors

.01 Demonstrate use of radiotelephone, using proper procedures and circuit discipline . . . . . E-4 -

2.00 Examination Factors

None.

I. SMALL ARMS

1.00 Practical Factors

.01 Fire all unit service weapons . . . . . E-4 -  
 .40 Demonstrate proficiency in use of .45 cal. service pistol by firing the Course "E" (Pistol and Revolver National Match Course) or its equivalent . . . . . E-5 -  
 .60 Instruct in proper use of unit weapons, and protective mask . . . E-6 E-6

2.00 Examination Factors

None.

SENIOR CHIEF PORT SECURITYMAN (PSCS)/SENIOR CHIEF FIREFIGHTER (FICS)

A. SECURITY OF VESSELS AND WATERFRONT FACILITIES		Required for	
		Advancement to	
1.00 Practical Factors		PS	FI
.90	Supervise law enforcement procedures as related to the legal authority in Port Security . . . . .	E-8	-
.91	Supervise and direct loading, stowing, securing of, and off-loading of dangerous cargo. (As provided for by CG-239 and 46 CFR 146-149 30-40, 98 and 151) . . . . .	E-8	-
.92	Supervise and direct effective fire prevention . . . . .	-	E-8
.93	Demonstrate knowledge of elements of fire-resistive construction . . . . .	-	E-8
.94	Inspect firefighting appliances and equipment on tankers and barges . . . . .	-	E-8
2.00 Examination Factors			
.90	Regulations governing classification, preparation, security, and declassification of classified material . . . . .	E-8	E-8
.91	Knowledge, legal authority, and responsibility for the enforcement of the Load Line Act . . . . .	E-8	E-8
.92	Knowledge, legal authority, and responsibility for the enforcement of Tank Vessel regulations and the regulations covering bulk dangerous cargoes on unmanned barges . . . . .	E-8	E-8
.93	Technical knowledge and supervision of the many aspects of safety and fire protection as related to Port Security . . . . .	-	E-8

MASTER CHIEF PORT SECURITYMAN (PSCM)/MASTER CHIEF FIREFIGHTER (FICM)

A. SECURITY OF VESSELS AND WATERFRONT FACILITIES			
1.00 Practical Factors			
.95	Prepare an Organization Bill showing chain of command and listing duties of sections and sub-sections of a Port Security installation . . . . .	E-9	-
.96	Prepare a Fire Bill for a Port Security Installation . . . . .	-	E-9
.97	Manage and supervise operations and procedures at Port Security installations involving:		
	a. Security and Law Enforcement . . . . .	E-9	-
	b. Dangerous Cargo . . . . .	E-9	-
	c. Safety and Fire Prevention . . . . .	E-9	E-9
.98	Develop training program for rating . . . . .	E-9	E-9
.99	Develop a safety program . . . . .	E-9	E-9
.991	Demonstrate administrative techniques and ability necessary for the operation of a Port Security installation . . . . .	E-9	E-9
.992	Evaluate the capabilities and limitations of a designated waterfront facility . . . . .	E-9	-
2.00 Examination Factors			
.95	Scope and missions of the Port Securityman and Firefighter . . . . .	E-9	E-9

MASTER CHIEF PORT SECURITYMAN (PSCM)/MASTER CHIEF FIREFIGHTER (FICM)

A. SECURITY OF VESSELS AND WATERFRONT FACILITIES - Continued

Required for  
Advancement to  
PS FI

2.00 Examination Factors - Continued

- |     |  |     |     |
|-----|--|-----|-----|
| .96 | New trends in firefighting equipment systems and installations . .                       | -   | E-9 |
| .97 | New trends in firefighting techniques . . . . .  | -   | E-9 |
| .98 | Current law enforcement concepts involving the entire Port Security<br>program . . . . . | E-9 | -   |

# BEACH PATROL GROUP VIII

Light Plane Pilot  
~~Coastal Force~~

APL  
GF #4

**BEACH PATROL  
GROUP VIII**

Light Plane Pilot  
~~Coastal Force~~

APL  
GF #4

**LIGHT PLANE PILOT (APL)**

**EMERGENCY RATING (PO2 through MCPO)**

**SCOPE**

Light plane pilots are qualified for the actual control of heavier-than-air light aircraft, and are assigned to duty involving flying as pilots or co-pilots. They have a thorough knowledge of Coastal Force duties and operational techniques pertaining to speciality.

**QUALIFICATIONS FOR ADVANCEMENT IN RATE**

**NOTE** - The qualification requirements for advancement to Chief Petty Officer consist of greater proficiency in skills and greater scope of knowledges prescribed for the second and first class petty officer rates.

**A. SAFETY AND SURVIVAL**

**Required for  
Advancement to  
APL**

**1.00 Practical Factors**

- .40 Be capable of properly using all survival equipment used with aircraft being operated . . . . . E-5
- .41 Be familiar with all types of aviation survival equipment . . . . . E-5
- .42 Readily identify U.S. and foreign vessels and aircraft as required. . . . . E-5
- .43 Understand both the capabilities and limitations of small boats . . . . . E-5
- .44 Demonstrate ability to administer first-aid treatment . . . . . E-5
- .45 Demonstrate ability to use small arms . . . . . E-5
- .46 Observe safety precautions in and around aircraft . . . . . E-5

**2.00 Examination Factors**

- .40 Operation and function of aviation ordnance equipment used in aircraft being operated . . . . . E-5
- .41 Methods of using standard aviation survival equipment . . . . . E-5
- .42 Safety precautions for handling of small arms . . . . . E-5

**B. AIRCRAFT FLIGHT AND MAINTENANCE**

**1.00 Practical Factors**

- .40 Exercise good judgment and show technical skill and piloting ability in regard to aerial tactics, aerial navigation, aircraft inspections and communications . . . . . E-5
- .41 Perform instrument flying and night flying, using radio aids to navigation . . . . . E-5

**2.00 Examination Factors**

- .40 Theory of operation, nomenclature, performance, inspections, materials, and maintenance of aircraft engines. . . . . E-5
- .41 Nomenclature, upkeep, inspections, maintenance, and materials of aircraft structures. . . . . E-5
- .42 Theory of flight. . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AFL

B. AIRCRAFT FLIGHT AND MAINTENANCE - Continued

2.00 Examination Factors - Continued

- .43 Effects of weight and balance on operation of aircraft. . . . . E-5
- .44 Aircraft control instruments, principles of operation,  
use and their errors. . . . . E-5
- .45 Proper inspection and maintenance procedures for aircraft being  
operated. . . . . E-5

C. NAVIGATIONS, COMMUNICATIONS AND WEATHER

1.00 Practical Factors

- .40 Send and receive international Morse Code by individual  
characters with blinker light and key . . . . . E-5

2.00 Examination Factors

- .40 Operation and function of airborne radio and electrical  
equipment used in aircraft being operated . . . . . E-5
- .41 Navigation including dead reckoning, and operations and  
functions of navigation equipment used in aircraft being  
operated. . . . . E-5
- .42 Applied communications procedure, sending and receiving,  
communication instructions. . . . . E-5
- .43 Aerological aids to flying including synoptic weather maps,  
sequence reports, weather conditions effecting flying, such  
as cloud formations and dew point . . . . . E-5
- .44 Recognition of storm warnings, boat signals and distress signals. . . . . E-5

D. ADMINISTRATION AND SUPPLY

1.00 Practical Factors

- .40 Prepare aircraft maintenance and operational reports as  
required by current directives. . . . . E-5
- .41 Prepare reports as required by Coastal Force directives . . . . . E-5
- .42 Have a thorough knowledge of Coastal Force duties pertaining  
to his specialty. . . . . E-5
- .60 Organize and operate a light plane detail consisting of one  
or more aircraft. . . . . E-6

2.00 Examination Factors

- .40 Federal Aviation Agency regulations, including rules governing  
operation of aircraft, communications, and weather minimums;  
general content and use of technical bulletins, manuals, and  
spare parts catalogs. . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
APL

D. ADMINISTRATION AND SUPPLY - Continued

2.00 Examination Factors - Continued

- .41 Knowledge of organization of Coast Guard, Coast Guard Aviation,  
and Coastal Forces; chain of command . . . . . E-5
- .42 Definition of arrest; elements of a lawful arrest; consequences  
of a false arrest . . . . . E-5
- .60 Procedures for ordering, receiving, issuing, inventorying, and  
keeping records for aviation spare parts . . . . . E-6





AG



LI



MU



PH



TD

# MISCELLANEOUS GROUP IX

Aerographer's Mate	AG	
<del>Lithographer</del>	<del>LI</del>	#5
Musician	MU	
Photographer's Mate	PH	
Tradevman	TD	
Marine Science Technician	MST	#4

Amend. No. 2

" EMERGENCY RATING"

AEROGRAPHER'S MATE (AG)

~~GENERAL RATING~~

SCOPE

Aerographer's Mates observe, collect, record and analyze meteorological and sea condition data for military use; make visual and instrumental weather and sea condition observations; interpret weather codes and enter data on appropriate charts; and forecast weather and sea conditions from proper charts in order to furnish advice concerning probable changes in the weather and sea conditions and the effect of the weather and sea upon operations.

NOTE: Practical Factors for the Aerographer rating are applicable to the Weather Unit equipment assigned or available.

SERVICE RATING

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AG

A. METEOROLOGY AND CLIMATOLOGY

1.00 Practical Factors

None.

2.00 Examination Factors

- .01 Application of basic laws of motion, gases, heat and energy to meteorology. . . . . E-4
- .02 General characteristics of frontal systems; vertical-structure and composition of the atmosphere. . . . . E-4
- .40 Primary, secondary and tertiary circulations of the earth's atmosphere . E-5
- .41 Types of weather associated with fronts, airmasses, cyclonic and anticyclonic systems . . . . . E-5
- .60 Formation, structure and characteristics of fronts, airmasses, cyclonic and anticyclonic systems . . . . . E-6
- .80 Weather and climate of the world . . . . . E-7

B. INSTRUMENTS AND EQUIPMENT

1.00 Practical Factors

- .01 Operate weather facsimile and teletype equipment . . . . . E-4
- .02 Prepare radiosonde transmitter and balloon for release; check operation of equipment. . . . . E-4
- .03 Perform routine checks and preventive maintenance of standard nonelectronic meteorological instruments . . . . . E-4
- .04 Exercise care in handling and stowing aerological instruments. . . . . E-4
- .40 Perform operator's preventive maintenance of standard meteorological electronic equipment . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AG

B. INSTRUMENTS AND EQUIPMENT - Continued

1.00 Practical Factors - Continued

.60 Test, calibrate and adjust meteorological instruments, excluding electronic components. . . . . E-6

2.00 Examination Factors

.01 Precautionary measures to be observed in the care and handling of meteorological instruments . . . . . E-4  
 .02 Operating principles and functions of standard non-electronic meteorological instruments . . . . . E-4  
 .40 Basic functions and general operating principles of standard electronic meteorological instruments . . . . . E-5

C. OBSERVATION

1.00 Practical Factors

.01 Make, record and prepare for transmission surface observations and upper wind observations. . . . . E-4  
 .40 Make radiosonde and rawinsonde observations . . . . . E-5  
 .60 Interpret and evaluate radar echoes of weather . . . . . E-6

2.00 Examination Factors

None.

D. CODES AND PLOTTING

1.00 Practical Factors

.01 Decode weather codes and plot data on surface and upper air charts . . . E-4  
 .02 Decode and plot a radiological fallout message . . . . . E-4  
 .40 Determine times of sunrise, sunset, moonrise, moonset and twilight; determine tidal information. . . . . E-5  
 .60 Construct a radiological fallout plot from upper wind observations . . . E-6

2.00 Examination Factors

.01 Meteorological terminology, legends used on analyzed charts, and common symbols and codes. . . . . E-4

E. ANALYZING AND FORECASTING

1.00 Practical Factors

.01 Sketch isobars, principal fronts and precipitation areas on a synoptic weather chart. . . . . E-4

**QUALIFICATIONS FOR ADVANCEMENT**

Required for  
Advancement to  
AG

**E. ANALYZING AND FORECASTING - Continued**

**1.00 Practical Factors - Continued**

- .40 Draw a synoptic weather chart showing fronts, isobars, isallobars, and precipitation . . . . . E-5
- .41 Draw upper air charts . . . . . E-5
- .60 Analyze arowagrams and use resultant data in forecasting . . . . . E-6
- .61 Analyze synoptic charts showing projected movement of all fronts, pressure systems, and regions of frontogenesis, frontolysis, cyclogenesis, and anticyclogenesis . . . . . E-6
- .62 Prepare weather and sea-swell forecasts for ship or aircraft operations . . . . . E-6
- .63 Make weather forecasts for extended flights and flight planning, including preparation of weather vertical cross-sectional diagram . . . E-6
- .80 Prepare and verify prognostic surface and upper air charts . . . . . E-7
- .81 Make weather forecasts for extended periods . . . . . E-7
- .82 Draw a streamline analysis . . . . . E-7

**2.00 Examination Factors**

- .60 Principles of surface and upper air analysis and prognostication of fronts and pressure systems in the preparation of forecasts . . . . E-6
- .61 Principles and methods of forecasting sea, surf, and swell . . . . . E-6

**F. ADMINISTRATION**

**1.00 Practical Factors**

- .01 Typewrite for 5 minutes at 20 words per minute (See Performance Test Instructions) . . . . . E-4
- .40 Maintain current weather office files of applicable publications, charts, directives, and manuals . . . . . E-5
- .60 Supervise the use, filing, and maintenance of publications, charts, and records . . . . . E-6
- .80 Organize and administer a weather unit . . . . . E-7
- .81 Supervise the preparation of charts and reports . . . . . E-7
- .82 Instruct and supervise personnel in the use and maintenance of meteorological equipment and in the collection, analysis and use of meteorological data . . . . . E-7

**2.00 Examination Factors**

- .40 Procedures for requisitioning meteorological supplies, equipment, and publications . . . . . E-5
- .60 Disposal instructions for meteorological charts, records, and reports . . E-6
- .61 Current directives pertaining to weather for flight clearance . . . . . E-6
- .80 Procedures for surveying and accounting of meteorological material and equipment . . . . . E-7
- .81 Initial requirements governing organization, administration, and installation of equipment in a weather unit . . . . . E-7

★ SENIOR CHIEF AEROGRAPHER'S MATE (AGCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
AG

- 1.00 Practical Factors
  - .90 Conduct a program of inspection to ensure compliance with safety instructions and regulations pertaining to the operation and maintenance of aerological equipment . . . . . E-8
  - .91 Analyze climatological data . . . . . E-8
  - .92 Analyze, evaluate, and forecast typhoon/hurricane movements and composition . . . . . E-8
  - .93 Plan and conduct weather briefings at staff or planning levels . . . . . E-8
  - .94 Perform specialized types of analyses, such space differential, tropopause, jet stream and isotach, wind shear, and streamline (continuous and discontinuous) . . . . . E-8
- 2.00 Examination Factors
  - .90 Tropical meteorology and associated weather phenomena . . . . . E-8
  - .91 Ocean currents and related weather phenomena . . . . . E-8
  - .92 Polar meteorology and associated weather phenomena . . . . . E-8
  - .93 General requirements and procedures of weather communications . . . . . E-8
  - .94 Mission, organization, and functions of the Naval Weather Service . . . . . E-8

★ MASTER CHIEF AEROGRAPHER'S MATE (AGCM)

QUALIFICATIONS FOR ADVANCEMENT

- 1.00 Practical Factors
  - .95 Plan, implement, and monitor a safety program for aerological equipment and spaces . . . . . E-9
  - .96 Provide technical information and advice concerning operational use, capabilities, limitations, and reliability of aerological equipment and information . . . . . E-9
  - .97 Make vertical analyses of oceanographic soundings to determine thermocline depth, trapping layers, salinity, and sonar range depths. . . . . E-9
  - .98 Evaluate recent meteorological developments and publications in terms of local needs and activities and, when appropriate, integrate knowledge/procedure into local routine . . . . . E-9
- 2.00 Examination Factors
  - .95 Theory of long waves . . . . . E-9
  - .96 Principles of micro-meteorology . . . . . E-9
  - .97 Principles and application of oceanography to sonar range forecasting . . . . . E-9

MARINE SCIENCE TECHNICIAN (MST)

GENERAL RATING

SCOPE★

Marine Science Technicians observe, collect, record, reduce, analyze, and disseminate meteorological and oceanographic data for military and civil use; make visual and instrumental weather and oceanographic observations; conduct routine chemical analysis; encode and decode data; enter data on appropriate logs, charts, and forms; and analyze and interpret weather and sea conditions to furnish advice concerning probable changes and their effect on operations.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to MST

A. SAFETY

1.00 Practical Factors

- .01 Demonstrate and observe safety instructions and regulations pertaining to the operation and maintenance of meteorological and oceanographic equipment and instruments ..... E-4
- .02 Inspect work areas for potentially hazardous conditions and practices; and demonstrate inspection requirements ..... E-4
- .40 Interpret directives and instructions on safety precautions to identify those applicable to work areas, meteorological and oceanographic equipment and instruments; and demonstrate applicable safety precautions ..... E-5
- ★.60 Conduct a program of inspection to ensure compliance with safety instructions and regulations pertaining to the operation and maintenance of meteorological and oceanographic equipment and instruments ..... E-6

2.00 Examination Factors

None.

B. EQUIPMENT AND INSTRUMENTS

1.00 Practical Factors

- ★.01 Operate teletype equipment for 5 minutes at 20 words per minute (See Performance Test Instructions) ..... E-4
- .02 Perform basic calculations using digital computer ..... E-4
- .03 Perform routine checks and preventive maintenance of standard non-electronic equipment and instruments ..... E-4
- .04 Perform operator's preventive maintenance of standard meteorological and oceanographic electronic equipment ..... E-4
- .05 Operate standard meteorological and oceanographic equipment and instruments ..... E-4
- .40 Test, calibrate, adjust and perform basic repairs on meteorological and oceanographic instruments, excluding electronic components ..... E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to MST

B. EQUIPMENT AND INSTRUMENTS - Continued

2.00 Examination Factors

- .01 Precautionary measures to be observed in the care and handling of meteorological and oceanographic equipment and instruments ..... E-4
- .02 Operating principles and functions of standard non-electronic meteorological and oceanographic equipment and instruments ..... E-4
- .40 Basic functions and principles of standard electronic meteorological and oceanographic instruments ..... E-5

C. OBSERVATIONS

1.00 Practical Factors

- .01 Make, record, and prepare for transmission surface observations ..... E-4
- .02 Make, record, and prepare for transmission standard oceanographic station observations ..... E-4
- .41 Supervise the taking of an oceanographic station ..... E-5
- ★ .60 Organize observational programs according to specifications ..... E-6

2.00 Examination Factors

- ★ .01 Basic principles of surface observations ..... E-4
- .40 Standard sampling equipment for the collection of physical, chemical, biological, and geological data ..... E-5

★ D. CODES AND PLOTTING

1.00 Practical Factors

- .01 Encode data collected from meteorological and oceanographic observations ..... E-4
- .02 Decode meteorological and oceanographic messages for evaluation of data ..... E-4
- ★ .03 Plot meteorological and oceanographic data on appropriate surface, sub-surface, and upper air charts, graphs, and nomograms ..... E-4

2.00 Examination Factors

- ★ .01 Standard Meteorological and oceanographic terminology and commonly used codes, symbols and legends ..... E-4

★ E. DATA PROCESSING AND ANALYSIS

1.00 Practical Factors

- .01 Plot meteorological and oceanographic data on appropriate surface, sub-surface, and upper air charts, graphs, and nomograms ..... E-4
- .02 Sketch routine isopleths of M&O parameters ..... E-4

QUALIFICATIONS FOR ADVANCEMENT

		Required for Advancement to MST
<b>E. DATA PROCESSING AND ANALYSIS - Continued</b>		
1.00 Practical Factors - Continued		
.03	Conduct routine chemical analyses of serial oceanographic samples ...	E-4
.40	Analyze serial oceanographic data for quality control .....	E-5
★ .41	Process serial oceanographic data for submission to data centers .....	E-5
★ .42	Draw, analyze and interpret standard meteorological and oceanographic charts and graphs .....	E-5
★ .60	Plan and direct oceanographic data processing functions of a unit .....	E-6
★ .61	Perform specialized types of analyses of oceanographic data .....	E-6
★ .62	Make vertical analyses of serial oceanographic observations to determine thermocline depth, trapping layers, and sonar range depths .....	E-6
.80	Plan and direct meteorological data processing functions of a unit .....	E-7
.81	Analyze climatological data of the air-sea interface .....	E-7
2.00 Examination Factors		
.01	Basic principles of meteorological and oceanographic data pro- cessing .....	E-4
.02	Mathematical functions as applied to meteorological and oceanographic data processing .....	E-4
.40	Principles of meteorological and oceanographic data quality control .....	E-5
.60	Principles of advanced meteorological and oceanographic data processing .....	E-6
★ .80	Principles of advanced meteorological data processing .....	E-7
<b>F. FUNDAMENTALS OF MARINE SCIENCE AND CLIMATOLOGY</b>		
1.00 Practical Factors		
None.		
2.00 Examination Factors		
★ .01	Application of basic laws of physics to meteorology and oceanography .....	E-4
.02	Vertical and horizontal structure, composition, and general characteristics of the atmosphere and oceans .....	E-4
.40	Primary, secondary, and tertiary circulations of the earth's at- mosphere and oceans .....	E-5
.41	Types of weather associated with fronts, air masses, and pressure systems .....	E-5
.42	Principles affecting sea surface drift problems .....	E-5
.60	Formation, structure, and characteristics of fronts, airmasses, watermasses, and pressure systems .....	E-6



QUALIFICATIONS FOR ADVANCEMENT

F. FUNDAMENTALS OF MARINE SCIENCE AND CLIMATOLOGY - Continued Required for  
Advancement to MST

2.00 Examination Factors - Continued

- .61 Physical properties and distribution of sea water that affect the formation, drift, and deterioration of sea ice, sound propagation, and light transmission ..... E-6
- .62 Theory of ocean currents ..... E-6
- .63 Watermasses and budgets of the world's oceans ..... E-6
- .80 Climatology of the air-sea interface ..... E-7
- .83 Effects of topography on world climates ..... E-7

G. ADMINISTRATION

1.00 Practical Factors

- .40 Maintain office or laboratory files of applicable correspondence, publications, charts, directives, and manuals ..... E-5
- ★ .60 Instruct and supervise personnel in the use and maintenance of oceanographic equipment; and in the collection, analysis, and use of oceanographic data ..... E-6
- .80 Instruct and supervise personnel in the use and maintenance of meteorological equipment; and in the collection, analysis, and use of meteorological data ..... E-7

2.00 Examination Factors

- .40 Procedures for requisitioning and maintaining the inventory of meteorological and oceanographic supplies and equipment within allowances specified in current directives ..... E-5
- .41 Disposal instructions for meteorological and oceanographic charts, records, and reports ..... E-5
- .42 Current directives pertaining to routine Coast Guard oceanographic programs ..... E-5
- .60 Procedures for surveying and accounting for meteorological and oceanographic material and equipment ..... E-6
- ★ .61 Initial requirements governing organization, administration, and installation of equipment in an oceanographic unit or laboratory ..... E-6
- .80 Initial requirements governing organization, administration, and installation of equipment in a meteorological office ..... E-7

SENIOR CHIEF MARINE SCIENCE TECHNICIAN (MSTCS)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .90 Plan, implement, and monitor a safety program for meteorological and oceanographic equipment and spaces ..... E-8
- .91 Provide technical information and advice concerning operational use, capabilities, limitations, and reliability of meteorological and oceanographic equipment and information ..... E-8

SENIOR CHIEF MARINE SCIENCE TECHNICIAN (MSTCS) - Continued

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors - continued

- .92 Plan and conduct meteorological and oceanographic briefings at staff or planning levels ..... E-8
- .93 Plan and direct oceanographic surveys ..... E-8

2.00 Examination Factors

- ★.90 Tropical meteorology and Forecasting ..... E-8
- .91 Ocean currents and related weather phenomena ..... E-8
- .92 Polar meteorology and oceanography and associated phenomena ..... E-8
- .93 Mission, organization, and functions of the National Marine Science effort ..... E-8

MASTER CHIEF MARINE SCIENCE TECHNICIAN (MSTCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Evaluate recent meteorological and oceanographic developments and publications in terms of local needs and activities and, when appropriate, integrate knowledge/procedure into local routine ..... E-9

2.00 Examination Factors

- ★.95 Theory of Atmospheric waves ..... E-9
- .96 Principles of micro-analysis and internal wave studies ..... E-9
- .97 Principles and application of oceanography to sonar range forecasting ..... E-9

2-11-2

MUSICIAN (MU)

GENERAL RATING (PO2, PO1, POC, POCS, POCM)

SCOPE

Musicians provide music as members of bands and orchestras for various functions and ceremonies in the interest of morale and esprit de corps, in support of recruiting functions and public and foreign relations; perform on one or more designated instruments; and perform other musical skills as may be required in the performance of the rating.

NOTE - Candidates for advancement will be examined in practical factors by a Bandmaster. In the absence of a Bandmaster candidates will be examined by a Chief Musician.

QUALIFICATIONS FOR ADVANCEMENT (Applicable to the Official Coast Guard Band Only)

Required for Advancement to MU

A. THEORY

1.00 Practical Factors

- .40 Play from memory all major and minor scales and major and minor triads (Except Drummers) . . . . . E-5
- .41 Play moderately difficult technical exercises, drummers play from memory, all 26 rudiments . . . . . E-5
- .58 Instrumental requirements for advancement in rate shall be the same as required for initial acceptance in the Official United States Coast Guard Band. "Prior to being accepted in the United States Coast Guard Band, applicant shall demonstrate in the presence of the band director a high degree of proficiency while performing difficult literature from the band library. All applicants shall possess instrumental ability of a degree enabling them to assume and meet principal chair requirements of the band."
- .59 Be able to copy music legibly and accurately
- .60 Transpose a tone higher or lower at sight . . . . . E-6
- .61 Play advanced technical exercises . . . . . E-6
- .80 Play highly advanced exercises, drummers play all advanced band music . . . . . E-7
- .81 Play all band parts in advanced music . . . . . E-7

2.00 Examination Factors

- .40 Qualities of sound, notation, scales and transposition . . . . . E-5
- .41 Passing tones and auxiliaries . . . . . E-5
- .60 Nonessential tones . . . . . E-6

B. HARMONY

1.00 Practical Factors

None.

2.00 Examination Factors

- .40 Intervals, construction of triads . . . . . E-5
- .41 Elementary use of triads, dominant 7th chords . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MU

B. HARMONY - Continued

2.00 Examination Factors - Continued

- .60 Secondary triads, chord progressions, simple modulation and diatonic sevenths . . . . . E-6
- .80 Higher dominant discords; secondary dominants; chromatic supertonic chords; Neapolitan sixth chords, altered tonics; chords of the augmented sixth chromatic alterations; advanced modulations . . . . . E-7

C. KNOWLEDGE OF INSTRUMENTS

1.00 Practical Factors

- .40 Maintain, regulate and make minor repairs to instrument(s) played . . . . . E-5

2.00 Examination Factors

- .40 Pitch of all band instruments . . . . . E-5
- .60 Range of all band instruments . . . . . E-6
- .80 Technical difficulties of instruments . . . . . E-7

D. ADMINISTRATION

1.00 Practical Factors

- .40 Be able to perform all marching maneuvers to a high degree of perfection . . . . . E-5

2.00 Examination Factors

- .40 Music and ruffles and flourishes required for official visits . . . . . E-5
- .41 Regulations governing honors, ceremonies and escorts . . . . . E-5

E. FORMS IN MUSIC

1.00 Practical Factors

None.

2.00 Examination Factors

- .40 Principles of form . . . . . E-5
- .60 Small forms . . . . . E-6

★ SENIOR CHIEF MUSICIAN (MUCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
MU

1.00 Practical Factors

.90 Supervise daily operation of a Coast Guard band . . . . . E-8

2.00 Examination Factors

.90 Manuals, texts, materials, and training aids utilized in the  
training and directing of bands and musician personnel . . . . . E-8  
.91 Organization and function of Coast Guard bands . . . . . E-8

★ MASTER CHIEF MUSICIAN (MUCM)

QUALIFICATIONS FOR ADVANCEMENT

.95 Evaluate musical background and instrumental proficiency and  
potential of applicants for the Coast Guard music program . . . . . E-9  
.96 Conduct a large band in performance of advanced literature . . . . . E-9

2.00 Examination Factors

.95 Principles of musical aptitude and instrumental proficiency tests . . . E-9  
.96 Plans and policies of the Coast Guard music program . . . . . E-9

PHOTOGRAPHER'S MATE (PH)

GENERAL RATING

SCOPE

Photographer's Mates accomplish photographic work required by the Coast Guard; record actual or simulated battle operations; make pictorial records of historical and newsworthy events aboard ships and at shore stations; operate and maintain various types of motion picture and still cameras; operate service aerial cameras; perform copying, developing, printing, and finishing operations; operate any projection equipment connected with an audio-visual presentation; and when operating with the Navy will be expected to have a basic knowledge of Navy equipment and procedures.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for Advancement to PH

A. SAFETY

1.00 Practical Factors

- .01 Observe safety precautions in handling, stowing, and mixing corrosive, toxic, and flammable chemicals, supplies, and equipment used in photography . . . . . E-4
- .60 Inspect photographic work areas and equipment for potentially hazardous conditions and practices and take appropriate action . . . . . E-6
- .61 Interpret directives and instructions on safety precautions to identify those applicable to photographic work areas and equipment; establish safeguards, procedures, and standards to insure compliance by personnel supervised . . . . . E-6

2.00 Examination Factors

- .01 Procedures for neutralizing acids and alkalis used in photography. . . . . E-4
- .02 Types of antidotes for toxic agents used in photography and procedures for administering . . . . . E-4

B. PHOTOGRAPHING

1.00 Practical Factors

- .01 Select correct combinations of f/stop and shutter speeds to obtain optimum depth of field and exposure using an exposure meter . . . . . E-4
- .02 Select light filters for black and white photography . . . . . E-4
- .03 Identify commonly used film and load in plate holders, cartridges, and magazines . . . . . E-4
- .04 Set and operate hand and view cameras to take still photographs of a routine or historical nature . . . . . E-4
- .05 Take oblique aerial photographs . . . . . E-4
- .06 Adjust exposure meter for zero reading and check movement for freedom and balance . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PH

B. PHOTOGRAPHING - Continued

1.00 Practical Factors - Continued

.07	Set and operate cameras for photographic copying . . . . .	E-4
.40	Take photographs suitable for public information purposes . . . . .	E-5
.41	Arrange lighting and subject matter or personnel as necessary to make a professional looking photograph . . . . .	E-5
.42	Select light filters for color photography . . . . .	E-5
.43	Set and operate hand and view cameras to take photographs of immediate interest . . . . .	E-5
.44	Set and operate portable, 100-foot load motion picture cameras used in the Coast Guard . . . . .	E-5
.45	Depict an event by taking a series of photographs and assembling them in proper sequence . . . . .	E-5
.80	Determine types of cameras and associated equipment and materials necessary for any type of photographic assignment . . . . .	E-7
.81	Operate professional, production type motion picture cameras used in the Coast Guard . . . . .	E-7

2.00 Examination Factors

.01	Uses of Coast Guard photography . . . . .	E-4
.02	Types and characteristics of black and white film, including infrared. .	E-4
.03	Principles of illumination for personnel photography . . . . .	E-4
.04	Principles of flash (synchro-flash) photography . . . . .	E-4
.05	Fundamentals of motion picture photography . . . . .	E-4
.06	Procedures for handling and operating photographic equipment and supplies in hot and cold weather extremes . . . . .	E-4
.07	Nomenclature and functions of ground cameras and accessories, projectors, and viewing machines . . . . .	E-4
.40	Techniques of photographic composition . . . . .	E-5
.41	Fundamentals of aerial photography . . . . .	E-5
.42	Types of aerial photographic reconnaissance missions and equipment needed . . . . .	E-5
.43	Types and characteristics of color film . . . . .	E-5
.44	Techniques of portraiture . . . . .	E-5
.60	Fundamentals of preflight inspections of precision fixed vertical aerial reconnaissance and mapping cameras and control systems . . . . .	E-6
.61	Fundamentals of aerial mapping . . . . .	E-6
.62	Principles of operation of night aerial cameras and associated equipment . . . . .	E-6
.63	Types, characteristics, and applications of lighting equipment used for motion picture photography . . . . .	E-6
.64	Purpose and uses of high-speed motion picture cameras . . . . .	E-6
.65	Elements of motion picture production . . . . .	E-6
.80	Techniques and equipment used for radarscope and gun-camera photography . . . . .	E-7
.81	Operating principles of image motion compensating magazines and stabilized mounts used with aerial cameras . . . . .	E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PH

C. PROCESSING

1.00 Practical Factors

- .01 Weight, mix, and prepare photographic solutions following prescribed formulas . . . . . E-4
- .02 Develop black and white film by tray and tank processes . . . . . E-4
- .03 Recognize film negative defects caused by improper exposure, development, impurities, temperature, changes, and improper stowage . . . . . E-4
- .04 Develop, fix, and wash black and white photographic prints of high quality . . . . . E-4
- .05 Adjust and operate contact and projection printers . . . . . E-4
- .06 Affix identification to and file negatives and prints . . . . . E-4
- .07 Adjust and operate matte and glossy print dryers . . . . . E-4
- .40 Process sheet and roll color film . . . . . E-5
- .41 Adjust and operate photocopy machines . . . . . E-5
- .42 Apply intensification, reduction, and harmonizing treatment to negatives . . . . . E-5
- .43 Spot prints and opaque negatives . . . . . E-5
- .44 Caption photographs used for public information purposes . . . . . E-5
- .45 Edit, splice, and title motion picture film . . . . . E-5
- .60 Select color compensation filters and make color prints . . . . . E-6
- .61 Review completed laboratory work to ensure quality control . . . . . E-6

2.00 Examination Factors

- .01 Copyright and reproduction regulations . . . . . E-4
- .02 Types, characteristics, and uses of photographic chemicals, print papers, and other positive material including slides . . . . . E-4
- .03 Techniques of print and negative control . . . . . E-4
- .40 Techniques for reducing underexposed or underdeveloped color transparencies and basic methods of processing color films . . . . . E-5
- .41 Types of continuous strip printers and aerial photograph projection printers . . . . . E-5
- .42 Methods of processing aerial film and assembling prints into mosaics . . . . . E-5
- .43 Methods of threading and operating aerial roll film dryers . . . . . E-5
- .44 Principles of operation of motion picture film printers . . . . . E-5
- .60 Principles of operation of automatic continuous processing machines . . . . . E-6
- .80 Principles of stereoscopic orientation and mounting . . . . . E-7

D. PHOTOGRAPHIC EQUIPMENT MAINTENANCE AND OPERATION

1.00 Practical Factors

- .01 Perform preventive maintenance and minor repairs on:
  - a. Ground and hand aerial cameras . . . . . E-4
  - b. Laboratory equipment . . . . . E-4
- .40 Replace worn or damaged non-critical:
  - a. Camera parts . . . . . E-5
  - b. Laboratory equipment parts . . . . . E-5
- .41 Operate 16mm motion picture projectors, 35mm slide projectors, and other audio-visual aids . . . . . E-5



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PH

D. PHOTOGRAPHIC EQUIPMENT MAINTENANCE AND OPERATION - Continued

1.00 Practical Factors - Continued

- .60 Check shutter synchronization in ground still cameras to determine if adjustments are required . . . . . E-6
- .61 Evaluate operation of high-speed motion picture cameras to determine if corrective action is required . . . . . E-6
- .62 Evaluate performance of overhauled or newly installed photographic equipment . . . . . E-6
- .63 Supervise maintenance of photographic equipment . . . . . E-6
- .80 Analyze malfunctions in photographic equipment and determine corrective action . . . . . E-7
- .81 Screen defective photographic equipment for feasibility of local repair in lieu of exchange . . . . . E-7

2.00 Examination Factors

- .01 Types and characteristics of lubricants and solvents used for maintenance of photographic equipment . . . . . E-4
- .40 Types and operating principles of shutters and shutter trip mechanisms . . . . . E-5
- .60 Principles of photo aircraft viewfinders . . . . . E-6
- .61 Preparation of photographic equipment to be used in climatic extremes. . . . . E-6

E. THEORY AND PRINCIPLES

1.00 Practical Factors

None.

2.00 Examination Factors

- .01 Meaning of photographic terms and units of measure . . . . . E-4
- .02 Elementary physics of light, optics, and electricity . . . . . E-4
- .03 Properties of light sensitive emulsions . . . . . E-4
- .04 Elementary chemistry of negative and print development . . . . . E-4
- .05 Principles of photographic filters . . . . . E-4
- .06 Types and characteristics of photographic lenses . . . . . E-4
- .07 Functions of component parts of a simple camera . . . . . E-4
- .08 Spectral sensitivity of photographic emulsions and safe-light filter transmission . . . . . E-4
- .40 Theory of color photography . . . . . E-5
- .41 Effects of radiant energy on light-sensitive photographic equipment and materials . . . . . E-5
- .42 Effects of environment on photographic equipment and materials . . . . . E-5
- .60 Principles of electrical circuits used in photographic equipment . . . . . E-6
- .61 Fundamentals of quality control in photographic processing . . . . . E-6
- .62 Location of mechanical and electrical failures in photographic equipment and procedures for correction . . . . . E-6
- .80 Fundamentals of photographic sensitometry . . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PH

F. ADMINISTRATION

1.00 Practical Factors

- .40 Be familiar with the contents of Chapter 10, Guide to Public Information Services (CG-247) . . . . . E-5
- .60 Use Navy Stock List, NavSandA 2002, Section VIII, Cognizance Symbol I, to identify and order technical publications, directives, and manuals . . . . . E-6
- .61 Identify photographic parts and materials by nomenclature and stock number and prepare supply requisitions . . . . . E-6
- .62 Conduct inventories and maintain custody records . . . . . E-6
- .63 Establish negative and positive print files and ensure security . . . . . E-6
- .64 Prepare periodic reports of photographic operations . . . . . E-6
- .65 Initiate surveys of accountable photographic equipment . . . . . E-6
- .66 Demonstrate to and instruct personnel in performance of simple photographic duties . . . . . E-6
- .67 Organize and supervise the operation and maintenance of photographic equipment and the ordering of and use of supplies . . . . . E-6
- .68 Schedule photographic work and monitor progress to expedite completion . . . . . E-6
- .69 Prepare for special assignments by estimating photographic equipment, material, and personnel required . . . . . E-6
- .80 Determine and affix security classification to photographs, negatives, and data sheets; supervise personnel in maintaining security . . . . . E-7
- .81 Supervise the use, filing, and maintenance of photographic publications, logs, and records . . . . . E-7
- .82 Plan and lay out a typical photographic unit, including personnel requirements, type and quantity of materials and equipment necessary, and arrangement of space, ventilation, lighting, and storage of equipment . . . . . E-7

2.00 Examination Factors

- .01 General content and use of technical bulletins, publications, and catalogs pertaining to photography . . . . . E-4
- .40 Regulations concerning the marking and forwarding of negatives, prints, and motion picture film . . . . . E-5
- .41 Rules governing release of Coast Guard photographs . . . . . E-5
- .42 Sources of technical information pertaining to all photographic material and equipment . . . . . E-5
- .60 Organization and function of Coast Guard photography . . . . . E-6
- .61 Procedures of preventive maintenance pertaining to photographic equipment . . . . . E-6
- .62 Regulations and procedures pertaining to procurement, transfer, and disposal of photographic supplies and equipment . . . . . E-6
- .63 Instructions concerning maintaining a motion picture film library . . . . . E-6
- .80 Fundamentals of underwater photography . . . . . E-7

★ SENIOR CHIEF PHOTOGRAPHER'S MATE (PHCS)

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
PH

1.00 Practical Factors

- .90 Monitor all phases of photographic production processes to ensure compliance with standards of quality and workmanship . . . . . E-8
- .91 Review utilization of space, equipment, personnel, and material in photographic units to ensure applicable requirements are met . . . . . E-8
- .92 Plan, implement, supervise, and report on evaluations of new equipment, materials, and processes . . . . . E-8

2.00 Examination Factors

- .90 Principles of combining location, set design, composition, size, movement and dramatic action to obtain optimum effectiveness of presentation in still and motion photography . . . . . E-8
- .91 Specifications for passport photographs . . . . . E-8

★ MASTER CHIEF PHOTOGRAPHER'S MATE (PHCM)

QUALIFICATIONS FOR ADVANCEMENT

1.00 Practical Factors

- .95 Prescribe guidelines for safety instruction pertaining to photographic equipment, chemicals, and materials . . . . . E-9
- .96 Establish standards and procedures to be used in reviewing photographic production work to ensure that it is acceptable for release . . . . . E-9
- .97 Provide technical information and advice concerning operational use, capabilities, and limitations of photographic services . . . . . E-9

2.00 Examination Factors

- .95 Techniques for implementing a theme and for featuring subjects or characters in still or motion photographs . . . . . E-9
- .96 Types and purposes of funds for the operation of photographic facilities . . . . . E-9
- .97 Regulations and procedures concerning travel of personnel and equipment for photographic assignments . . . . . E-9

TRADESMAN (TD)

EMERGENCY RATING

SCOPE

Tradesmen install, service, maintain, and repair training devices; operate and perform operational and preventive maintenance on operational equipment used in conjunction with training devices; assist in the development, operation, and/or improvement used to train and maintain the proficiency of individuals and/or teams.

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TD

A. SAFETY

1.00 Practical Factors

- .01 Observe safety precautions in making adjustments and measurements on energized electrical and electronics equipment. . . . . E-4
- .02 Observe safety precautions in working with deenergized equipment to eliminate hazards of residual charges . . . . . E-4
- .03 Observe safety precautions in handling, stowing, and disposing of radioactive, cathode-ray and fluorescent tubes. . . . . E-4
- .40 Inspect work areas, tools, equipment, and training devices to detect potentially hazardous and unsafe conditions and take appropriate corrective action. . . . . E-5
- .60 Interpret directives and instructions on safety precautions to identify those applicable to training device work areas and equipment; establish safeguards, procedures, and standards to ensure compliance by personnel supervised . . . . . E-6
- .80 Organize and administer a program of safety instruction applicable to training devices and facilities. . . . . E-7

2.00 Examination Factors

None.

B. TRAINING DEVICE OPERATION

1.00 Practical Factors

- .01 Conduct voice communications on interphone and simulated radio circuits using proper procedures, terminology, and abbreviations. . . . . E-4
- .02 Perform preoperating checks on training devices. . . . . E-4
- .40 Operate training devices as an instructor of individuals and/or teams. . . . . E-5
- .60 Train personnel in the instructional use of training devices . . . . . E-6
- .80 Evaluate operators of training devices to determine their qualification to operate individual training devices . . . . . E-7

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TD

B. TRAINING DEVICE OPERATION - Continued

2.00 Examination Factors

.01	Basic principles of aircraft flight. . . . .	E-4
.02	Purposes and uses of aircraft indicating instruments . . . . .	E-4
.03	Basic procedures of aircraft flight operations . . . . .	E-4
.04	Instrument flight procedures . . . . .	E-4
.40	Basic principles of air route traffic control procedures . . . . .	E-5
.41	Fundamentals of ship and submarine operation simulated by training devices . . . . .	E-5
.42	Applications of radar; types, uses, and interpretation of radar indicators . . . . .	E-5
.60	Fundamentals of tactical problems simulated by training devices. . . . .	E-6
.61	Operating Principles of aircraft power plants. . . . .	E-6

C. TRAINING DEVICE PREVENTIVE MAINTENANCE

1.00 Practical Factors

.01	Clean, lubricate, and service training devices . . . . .	E-4
.02	Perform routine maintenance checks and inspections . . . . .	E-4
.03	Check for proper operation and adjust electrical control systems and indicating systems . . . . .	E-4
.04	Locate and identify maintenance test points. . . . .	E-4
.05	Check vacuum pumps, air compressors, and hydraulic pumps for correct output . . . . .	E-4
.06	Check air conditioners and ventilators to ensure proper environmental conditions for training devices. . . . .	E-4
.40	Perform calibrations, adjustments, and tests on electronic circuits. . . . .	E-5
.41	Check electrical generators, frequency changers, and rectifiers for proper operation . . . . .	E-5
.60	Analyze results of tests on training devices and take appropriate corrective action. . . . .	E-6
.80	Evaluate overhauled and newly installed training devices for proper operation . . . . .	E-7
.81	Supervise and direct inspection and maintenance of training devices. . . . .	E-7
.82	Determine deficiencies, analyze discrepancy trends, and develop inspection procedures. . . . .	E-7
.83	Prepare a schedule for preventive maintenance of training devices in compliance with current policies and procedures . . . . .	E-7

2.00 Examination Factors

.01	Cable, wire, and connector identification system . . . . .	E-4
.02	Lubricants and solvents used in the maintenance of training devices. . . . .	E-4
.40	Types and applications of electrical circuit protective devices. . . . .	E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TD

D. TRAINING DEVICE CORRECTIVE MAINTENANCE

1.00 Practical Factors

- .01 Test, select, and replace circuit parts, including electron tubes. . . . E-4
- .02 Localize defective parts in simple circuits through measurement of voltage, current, and resistance . . . . . E-4
- .03 Verify discrepancies in training devices and isolate defective components by troubleshooting procedures . . . . . E-4
- .40 Analyze operation of electronic circuits used in training devices and isolate malfunctions . . . . . E-5
- .41 Determine, through consideration of value, power dissipation, and tolerance, a suitable part or combination of parts to substitute for a defective component part. . . . . E-5
- .42 Replace components of and calibrate instrument indicating systems. . . . E-5
- .60 Inspect completed repairs to training devices to ensure that applicable technical specifications and standards of workmanship are met. . . . . E-6
- .61 Accomplish qualitative performance checks on repaired training devices . E-6
- .80 Screen defective exchangeable components for feasibility of local repair . . . . . E-7

2.00 Examination Factors

- .01 Types and characteristics of motors and generators . . . . . E-4
- .40 Electrical and electronic local and remote control circuits which use electronic and thermal relays, multiple switching arrangements, time delay circuits, and motor control circuits . . . . . E-5
- .60 Maintenance and repair techniques of miniaturized, printed, and potted circuits, including transistor circuits . . . . . E-6
- .80 Procedures for obtaining field engineering services. . . . . E-7

E. SYNCHROS, SERVO SYSTEMS, AND COMPUTERS

1.00 Practical Factors

- .01 Remove, install, mechanically align, and electrically zero synchros. . . E-4
- .02 Locate defects in mechanical computing elements, including differentials, linkages, cams, and slides. . . . . E-4
- .03 Adjust open loop control systems . . . . . E-4
- .04 Test functional computing elements, including potentiometers, motors, and function generators. . . . . E-4
- .40 Make phase, balance, and feedback adjustments to servoamplifiers . . . . E-5
- .41 Repair electromechanical servoactuators. . . . . E-5
- .42 Troubleshoot, adjust, and maintain servosystems used in training devices . . . . . E-5
- .43 Test and repair linear computing elements, including summing networks, phase inverters, and operational amplifiers. . . . . E-5
- .44 Repair functional computing elements, including potentiometers, motors, and function generators. . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TD

E. SYNCHROS, SERVOSYSTEMS, AND COMPUTERS - Continued

- 1.00 Practical Factors - Continued
  - .60 Analyze computer system malfunctions and isolate erroneous or inoperative unit, section, or element; take appropriate corrective action . . . . . E-6
  - .80 Evaluate results of tests and measurements performed on computers, servosystems, and synchros. . . . . E-7
- 2.00 Examination Factors
  - .01 Principles of component parts of hydraulic and pneumatic systems . . . . . E-4
  - .02 Fundamentals and applications of synchros and servosystems . . . . . E-4
  - .40 Types and characteristics of computing elements used to solve or simulate mathematical relationships. . . . . E-5
  - .41 Basic principles of analog-digital and digital-analog conversion . . . . . E-5
  - .42 Fundamentals and applications of input/output equipment for digital computer system. . . . . E-5
  - .60 Theory and operating characteristics of servosystems and computer circuits employing magnetic amplifiers and/or transistors. . . . . E-6
  - .80 Principles and application of digital memory devices used in training devices . . . . . E-7
  - .81 Procedures for selection of computer scale factors . . . . . E-7

F. THEORY AND PRINCIPLES

- 1.00 Practical Factors
  - None.
- 2.00 Examination Factors
  - .01 Meaning of electrical and electronic terms and units of measure. . . . . E-4
  - .02 Principles of electron tubes and solid state devices . . . . . E-5
  - .03 Principles of rectifiers, filters, and regulators in power supply circuits. . . . . E-4
  - .04 Principles of basic machines . . . . . E-4
  - .05 Theory of a.c. and d.c. electricity and principles of magnetism. . . . . E-4
  - .06 Elementary physics of heat, light, sound, fluids, gases, and electricity . . . . . E-4
  - .07 Function and characteristics of electronic circuit parts . . . . . E-4
  - .40 Principles of:
    - a. Dectectors, amplifiers, and oscillators. . . . . E-5
    - b. Phase inverters and cathode followers. . . . . E-5
    - c. Amplitude and frequency modulation . . . . . E-5
    - d. Resonant circuits, coupling circuits, and filter networks. . . . . E-5
    - e. Cathode ray tubes. . . . . E-5
    - f. LCR differentiating and integrating circuits . . . . . E-5
  - .41 Solid state devices circuit application. . . . . E-5
  - .60 Characteristics and principles of magnetic amplifiers. . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TD

F. THEORY AND PRINCIPLES - Continued

2.00 Examination Factors - Continued

- .61 Principles of limiter, clamper, counter, and discriminator circuits. . . E-6
- .62 Principles of sweep generators, gated amplifiers, and timing circuits. . E-6

G. TEST EQUIPMENT, DRAWINGS, SCHEMATICS, AND PUBLICATIONS

1.00 Practical Factors

- .01 Select and use test equipment to measure voltage, current, and resistance . . . . . E-4
- .02 Select, use, and maintain common hand tools, portable power tools, and measuring instruments in maintenance and repair of training devices. E-4
- .03 Locate and identify training device components by reference to handbooks of maintenance and service instructions. . . . . E-4
- .04 Use electrical and electronic schematics to trace circuits . . . . . E-4
- .05 Use mechanical, electrical, and electronic schematics and drawings to install and assemble components of training devices. . . . . E-4
- .40 Select and use frequency generators and oscilloscopes. . . . . E-5
- .60 Analyze tests and measurements to be made on training device components and determine most appropriate test equipment to use. . . . E-6
- .61 Interpret mechanical, electrical, and electronic schematics and drawings and make simplified versions. . . . . E-6

2.00 Examination Factors

- .01 Theory and operating characteristics of basic electrical measuring instruments. . . . . E-4
- .02 Types and uses of information contained in training device operating and maintenance publications . . . . . E-4
- .40 Types and application of general purpose electronics test equipment used in maintaining training devices . . . . . E-5
- .41 Circuit loading effects of test equipment. . . . . E-5

H. TRAINING AIDS

1.00 Practical Factors

- .01 Operate and perform minor repairs on training aids such as movie projectors, tape recorders (except those used in simulators), and slide projectors . . . . . E-4
- .40 Repair and maintain training aids. . . . . E-5
- .60 Devise, construct, or procure training aids for the support of classroom instruction. . . . . E-6
- .80 Assist operating units in the selection, development, and procurement of training aids in support of training programs . . . . . E-7



QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
TD

H. TRAINING AIDS - Continued

2.00 Examination Factors

- .01 Procedures for inspecting and repairing training films . . . . . E-4
- .40 Types and uses of training aids . . . . . E-5

I. ADMINISTRATION

1.00 Practical Factors

- .60 Identify and order technical publications, directives, and manuals . . . . . E-6
- .61 Identify and order parts, tools, equipment, and material . . . . . E-6
- .62 Conduct inventories and maintain custody records . . . . . E-6
- .63 Maintain records of operational utilization and equipment histories of training devices . . . . . E-6
- .64 Train personnel in the operation and maintenance of training devices . . . . . E-6
- .80 Coordinate maintenance of technical-bureau-controlled equipment employed with training devices . . . . . E-7
- .81 Organize and supervise facilities for repair and maintenance of training devices . . . . . E-7
- .82 Supervise the use, filing and maintenance of pertinent publications, logs and records; supervise preparation of required reports . . . . . E-7

2.00 Examination Factors

- .40 Procedures for procuring and stocking locally standard and non-standard repair parts in accordance with applicable ESO and ASO instructions and directives . . . . . E-5
- .60 Procedures for control, distribution, requisition, and disposition of training devices and associated material . . . . . E-6
- .61 Procedures for effecting modifications to training devices . . . . . E-6
- .62 Procedures for requesting the development of training aids and devices . . . . . E-6
- .63 General content and use of the Training Device Guide and Naval Training Device Center Index of Publications . . . . . E-6
- .80 Organization of and field services provided by the U. S. Naval Training Device Center . . . . . E-7
- .81 Procedures for administering the suballotment provided for supporting the installation, maintenance, and operation of training devices . . . . . E-7
- .82 Procedures for processing training devices into the overhaul program . . . . . E-7
- .83 Source of information for determining security classification of training devices and associated equipment and material . . . . . E-7
- .84 Use of applicable allowance lists, parts catalogs and forms in requisitioning and disposal of training devices and their spare parts . . . . . E-7



DT



HM

**DENTAL  
MEDICAL  
GROUP X**

Dental Technician  
Hospital Corpsman

DT  
HM

DENTAL TECHNICIAN (DT)

GENERAL RATING

SCOPE

Dental Technicians perform clinical and administrative duties, assisting dental officers in treatment of patients, giving first aid, preparing and carrying out dental administrative assignments, giving oral prophylactic treatment under supervision, and assisting in the preventive dental program. Dental Technicians may be qualified in other than the foregoing, such as dental prosthetic laboratory techniques and maintenance and repair of dental equipment. Dental Technicians must be prepared to assist in the prevention and treatment of nuclear, biological and chemical (NBC) warfare casualties.

SERVICE RATINGS

None.

QUALIFICATIONS FOR ADVANCEMENT

Required for Advancement to DT

A. BASIC SCIENCES

1.00 Practical Factors

None.

2.00 Examination Factors

.01 Pharmacology:

- a. Toxicology . . . . . E-4
- b. Properties, actions and dosage of drugs . . . . . E-4

.02 Elementary knowledge of anatomy and physiology with emphasis on head, neck and oral structure . . . . . E-4

.03 Recognition of common diseases of the gums . . . . . E-4

B. ADVANCED FIRST AID

1.00 Practical Factors

- .01 Render dental first aid . . . . . E-4
- .02 Give venipunctures as related to first aid . . . . . E-4

2.00 Examination Factors

- .01 Types and uses of dressings, bandages and splints . . . . . E-4
- .02 Dental first aid treatment . . . . . E-4
- .03 Parenteral therapy procedures . . . . . E-4
- .60 Early treatment and medical management of mass casualties . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DT

C. PRACTICAL PROCEDURES

1.00 Practical Factors

- .01 Keep dental department spaces and equipment in clean and sanitary condition . . . . . E-4
- .02 Prepare patients for dental examination and general dental treatment . . . . . E-4
- .03 Prepare dental materials such as amalgam alloy, dental cements, and impression materials for making impressions and restoring defective teeth . . . . . E-4
- .04 Sterilize and prepare complete dental set-ups for general dental treatment and minor exodontic procedures . . . . . E-4
- .05 Assist dental officer during examination and treatment of patients by performing the following:
  - a. Arrange dental instruments and materials and hand them to dental officer when required . . . . . E-4
  - b. Retract oral tissues to expose affected areas and maintain a clear field of operation . . . . . E-4
  - c. Direct water and air syringes to facilitate operative procedures . . . . . E-4
  - d. Position suction equipment and swab operative areas to remove accumulation of oral debris . . . . . E-4

2.00 Examination Factors

- .01 Preparation of dental operating room . . . . . E-4
- .02 Sterilization procedures . . . . . E-4
- .03 Preparation of patient for examination and general dental treatment . . . . . E-4
- .04 Nomenclature of operative instruments . . . . . E-4
- .05 Cabinet arrangement . . . . . E-4
- .06 Chair procedures for general dental treatment and minor exodontia . . . E-4
- .07 Manipulation of amalgam alloy, dental cements, acrylic rosins and impression materials . . . . . E-4

D. ORAL HYGIENE

1.00 Practical Factors

- .01 Remove stains and deposits from teeth, apply abrasive mixture and polish teeth. . . . . E-4
- .40 Instruct personnel in proper daily oral health care . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DT

D. ORAL HYGIENE - Continued

2.00 Examination Factors

- .01 Causes of formation of deposits on teeth . . . . . E-4
- .02 Prophylaxis procedures . . . . . E-4
- .60 Preventive dentistry . . . . . E-6

E. ROENTGENOLOGY

1.00 Practical Factors

- .01 Expose, process, mount and file periapical and bitewing x-ray films . . E-4
- .40 Expose and process occlusal and extra-oral films . . . . . E-5
- .60 Expose and process dental x-ray films of the head, torso and  
extremities . . . . . E-6

2.00 Examination Factors

- .01 Principles of roentgenography . . . . . E-4
- .02 The Rule of Isometry . . . . . E-4
- .03 Processing of x-ray films under high-temperature conditions . . . . . E-4
- .40 Roentgenographic techniques for occlusal and extra-oral films . . . . . E-5
- .41 Radiation hazards and monitoring . . . . . E-5

F. ORAL SURGERY PROCEDURE

1.00 Practical Factors

- .40 Prepare patients for oral surgery . . . . . E-5
- .41 Sterilize and prepare dental surgical trays for oral surgery . . . . . E-5
- .42 Act as surgical assistant in oral surgery procedures . . . . . E-5
- .60 Give patient postoperative medicaments and instructions as  
directed . . . . . E-6

2.00 Examination Factors

- .40 Preparation of patients for oral surgery . . . . . E-5
- .41 Instruments and appliances used in oral surgery . . . . . E-5
- .42 Oral surgical techniques . . . . . E-5

G. PROSTHODONTICS (Dental Technicians, Prosthetic only)

1.00 Practical Factors

- .01 Construct casts from various types of impressions . . . . . E-4
- .02 Prepare record bases and occlusion rims . . . . . E-4
- .03 Flask, pack, process, deflask, finish and polish partial and  
complete dentures . . . . . E-4
- .04 Repair, reconstruct, and reline complete and partial dentures . . . . . E-4

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DT

G. PROSTHODONTICS - Continued

1.00 Practical Factors - Continued

- .05 Contour wax dentures . . . . . E-4
- .40 Wax, sprue, invest, burn-out, cast and finish metal frameworks. . . . . E-5
- .41 Survey and transfer partial denture designs as directed . . . . . E-5
- .42 Perform wire bending and soldering procedures . . . . . E-5
- .43 Arrange teeth for complete and partial dentures . . . . . E-5
- .60 Construct inlays, crowns and bridges . . . . . E-6
- .61 Supervise a dental laboratory . . . . . E-6

2.00 Examination Factors

- .01 Principles and procedures in the use of prosthetic materials . . . . . E-4
- .40 Heat-treatment procedures and properties of gold alloys . . . . . E-5

H. DENTAL EQUIPMENT REPAIR (Dental Technicians, Repair only)

1.00 Practical Factors

- .01 Care for and sharpen dental instruments . . . . . E-4
- .02 Oil and clean dental equipment . . . . . E-4
- .03 Care for x-ray equipment . . . . . E-4
- .40 Perform preventive maintenance, repair and service on:
  - a. Air, gas and water systems . . . . . E-5
  - b. Unit electrical systems . . . . . E-5
  - c. Foot pump and motor chairs . . . . . E-5
  - d. Dental operating room accessory equipment . . . . . E-5
  - e. X-ray equipment . . . . . E-5
  - f. Sterilizers and autoclaves . . . . . E-5
  - g. Dental handpieces . . . . . E-5
  - h. Laboratory equipment . . . . . E-5

2.00 Examination Factors

- .40 Safety factors in use of dental equipment . . . . . E-5
- .41 Functions of parts in dental equipment. . . . . E-5
- .42 Electrical safety precautions . . . . . E-5

I. DENTAL ADMINISTRATION

1.00 Practical Factors

- .01 Chart dental conditions on proper dental records . . . . . E-4
- .02 Record dental treatment using prescribed dental abbreviations . . . . . E-4
- .03 Prepare dental appointment schedules . . . . . E-4
- .40 Prepare dental forms and records required for the functioning of  
dental activities . . . . . E-5
- .41 Prepare official correspondence . . . . . E-5

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
DT

I. DENTAL ADMINISTRATION - Continued

1.00 Practical Factors - Continued

- .42 Maintain and file records, correspondence, directives, and publications . . . . . E-5
- .43 Typewrite for 5 minutes at 20 words per minute (See Performance Test Instructions) . . . . . E-5
- .60 Maintain service records and prepare reports required of dental activities . . . . . E-6
- .61 Procure, maintain records for, and issue or dispose of, dental supplies and equipment including Coast Guard stock account procedures . . . . . E-6
- .62 Organize and set up files in accordance with Coast Guard filing system . . . . . E-6
- .63 Supervise dental storeroom or administrative office . . . . . E-6
- .64 Prepare and deliver lectures on oral hygiene and dental first aid . . . . . E-6
- .65 Instruct dental personnel in cleaning, wrapping, sterilizing and laying out dental surgical trays for all oral surgical procedures . . . E-6
- .80 Prepare and maintain a master scheduling appointment system for use in a large dental facility . . . . . E-7

2.00 Examination Factors

- .01 Methods, procedures and forms for charting . . . . . E-4
- .02 Preparation and maintenance of dental treatment forms and records . . . E-4
- .60 Purpose and general content of Coast Guard filing system . . . . . E-6
- .61 Security regulations for classified matter . . . . . E-6
- .62 Organization and administration of Coast Guard dental activities . . . E-6
- .63 Organization and functions of the Medical Department of the Coast Guard . . . . . E-6
- .80 Appropriation accounting: appropriations, allotments, allotment control and estimates of requirements . . . . . E-7
- .81 Personnel accounting in accordance with the Coast Guard Personnel Accounting Manual (CG-216) . . . . . E-7

J. NUCLEAR, BIOLOGICAL AND CHEMICAL (NBC) WARFARE DEFENSE

1.00 Practical Factors

None.

2.00 Examination Factors

- .01 Nuclear warfare defense; recognition factors, self-help and care of casualties . . . . . E-4
- .02 Recognition and treatment of chemical warfare casualties . . . . . E-4
- .03 Biological warfare and functional understanding of isolation techniques and control of epidemics . . . . . E-4

**★ SENIOR CHIEF DENTAL TECHNICIAN (DTCS)**

**QUALIFICATIONS FOR ADVANCEMENT**

**Required for  
Advancement to  
DT**

**1.00 Practical Factors**

None.

**2.00 Examination Factors**

- .90 Organization and function of medical elements of disaster control units . . . . . E-8
- .91 Principles of military personnel management . . . . . E-8
- .92 Dental operatory equipage and furnishing requirements . . . . . E-8

**★ MASTER CHIEF DENTAL TECHNICIAN (DTCM)**

**QUALIFICATIONS FOR ADVANCEMENT**

**1.00 Practical Factors**

None.

**2.00 Examination Factors**

- .95 Supervision of the Records Management Program . . . . . E-9
- .96 Procedures for conducting dental surveys and inspections . . . . . E-9
- .97 Dental department training opportunities for enlisted personnel, including schools and correspondence courses . . . . . E-9



## HOSPITAL CORPSMAN (HM)

### GENERAL RATING

#### SCOPE

Hospital Corpsmen perform duties as assistants in the prevention and treatment of disease and injuries, and in the administration of medical departments ashore and afloat; perform first aid; assist in the transportation of the sick and injured; assist with physical examinations; give nursing care to patients, including the administration of medicines and parenteral solutions; collect laboratory specimens and perform simple laboratory procedures; assist in the procurement, storage, and issue of medical supplies; instruct in personal hygiene, first aid, and self-aid; prepare and maintain medical records and reports; assist in the maintenance of sanitary conditions; and must be prepared to assist in the prevention and treatment of nuclear, biological, and chemical warfare casualties. Senior Hospital Corpsmen perform all the duties of the medical department, within the limitations of their professional competence, on small ships and stations to which no medical officer is attached. In addition to their general duties, Hospital Corpsmen may be trained to perform specialized duties in the operating room, clinical laboratory, X-ray, medical records office, and in other clinical and administrative departments. Also, Hospital Corpsmen may receive technical specialized training in service schools as designated by the Commandant.

#### SERVICE RATING

None.

#### QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
HM

##### A. ANATOMY AND PHYSIOLOGY

###### 1.00 Practical Factors

None.

###### 2.00 Examination Factors

- |  |     |
|--|-----|
| .01 Cell and tissue structure . . . . .  | E-4 |
| .02 Osteology: nomenclature, location and function . . . . .   | E-4 |
| .03 Myology: nomenclature, location and function of major muscles. .   | E-4 |
| .04 Elementary description and function of the circulatory, respiratory, digestive, genitourinary, endocrine and nervous systems; and the special sense organs . . . . . | E-4 |

##### B. FIRST AID, MINOR SURGERY AND EMERGENCY PROCEDURES

###### 1.00 Practical Factors

- |   |     |
|---|-----|
| .01 Apply various types of bandages, splints and dressings. . . . .                   | E-4 |
| .02 Demonstrate cardio-pulmonary resuscitation . . . . .                              | E-4 |
| .03 Administer first aid treatment to the injured and sick . . . . .                  | E-4 |
| .04 Transport injured without litter by approved hand- or back-carry method . . . . . | E-4 |
| .40 Suture minor wounds; demonstrate minor surgical procedures. . . .                 | E-5 |
| .41 Prepare and sterilize complete tray for minor surgical operation . . . . .        | E-5 |

###### 2.00 Examination Factors

- |  |     |
|--|-----|
| .01 Definitions and rules for first aid to the injured . . . . .       | E-4 |
| .02 Types and uses of bandages and dressings for battle wounds . . . . | E-4 |

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
HM

B. FIRST AID, MINOR SURGERY AND EMERGENCY PROCEDURES - Continued

2.00 Examination Factors - Continued

- .03 Types and uses of splints, splinting and other immobilization methods . . . . . E-4
- .04 First aid governing removal of foreign bodies from ears, eyes, nose, throat and superficial tissue . . . . . E-4
- .05 First aid supplies and equipment . . . . . E-4
- .39 First aid and/or minor surgery as emergency treatment for:
  - a. Asphyxia, hemorrhage, shock, wounds, sprains, dislocations, fractures and burns. . . . . E-4
  - b. Unconsciousness, heat stroke, heat exhaustion, frostbite, immersion foot, abscesses, bites and inflammations . . . . . E-4
  - c. Acute thoracic, abdominal and genitourinary conditions and dental conditions . . . . . E-5
- .40 Instruments and appliances for minor surgery . . . . . E-5
- .60 Anesthetic agents and techniques of administration; safeguards on producing anesthesia . . . . . E-6

C. PRINCIPLES AND TECHNIQUES OF PATIENT CARE

1.00 Practical Factors

- .01 Administer medicines by various routes . . . . . E-4
- .02 Record data on appropriate clinical forms . . . . . E-4
- .03 Supervise cleaning and sterilization of ward mess gear . . . . . E-4
- .40 Supervise lower-rated men in performance of clinic or ward duties . . . . . E-5

2.00 Examination Factors

- .01 Methods necessary for efficient management of a general medical or surgical ward . . . . . E-4
- .02 Principles of collection of specimens . . . . . E-4
- .03 General nursing procedures, and methods and care of patients, including surgical, infectious and contagious disease nursing . . . . . E-4
- .04 Sterilization and sterile techniques . . . . . E-4
- .05 Classification of diets, special methods of feeding, preparation of trays and feeding of patients . . . . . E-4
- .06 Techniques of catheterization . . . . . E-4
- .07 Approximate equivalents of apothecary, metric and household systems in common use . . . . . E-4
- .40 Diet therapy - health and disease . . . . . E-5

D. PHARMACY

1.00 Practical Factors

- .40 Dispense simple pharmaceutical preparations . . . . . E-5
- .60 Prepare simple pharmaceutical preparations . . . . . E-6

2.00 Examination Factors

- .60 Systems of weights and measures: apothecary, avoirdupois and metric . . . . . E-6
- .61 Pharmaceutical arithmetic, processes, preparations, incompatibility . . . . . E-6
- .62 Prescription writing and filling . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
HM

E. PHARMACOLOGY AND TOXICOLOGY

1.00 Practical Factors

None.

2.00 Examination Factors

- .01 Young's and Clarke's rules for calculating dosage . . . . . E-4
- .02 Uses, actions and cautions concerning commonly used drugs . . . . . E-4
- .03 Custody, handling and control of dangerous drugs . . . . . E-4
- .04 Maintenance of antidote locker and chart . . . . . E-4
- .60 Advanced therapeutics and toxicology . . . . . E-6

F. PREVENTIVE MEDICINE

1.00 Practical Factors

- .01 Keep medical and surgical wards and medical department equipment and storage spaces in orderly and sanitary condition . . . . . E-4
- .02 Inspect fresh and staple foodstuffs to determine fitness for human consumption . . . . . E-4

2.00 Examination Factors

- .01 Methods and materials used disinfecting and in keeping medical department spaces in clean and sanitary condition . . . . . E-4
- .02 Relation of personal hygiene and proper clothing in preservation of good health . . . . . E-4
- .03 Rodent and pest control methods and procedures . . . . . E-4
- .04 Types and methods of immunization . . . . . E-4
- .05 Contagious and communicable diseases: sources of infection, modes of transmission and methods of control . . . . . E-4
- .06 Water: source, purification and storage in the field . . . . . E-4
- .07 Soil: its relation to health and disease . . . . . E-4
- .08 Sewage: refuse and excreta disposal in the field . . . . . E-4
- .09 Ventilation, heating, lighting and berthing as applicable to health standards . . . . . E-4
- .10 Methods and principles of food storage, inspection and handling . . . . . E-4
- .11 Milk: storage, purification and bacteriological standards . . . . . E-4

G. CHEMICAL, BIOLOGICAL AND RADIOLOGICAL WARFARE

1.00 Practical Factors

None.

2.00 Examination Factors

- .01 Radiological defense, self-help and care of casualties . . . . . E-4
- .02 Recognition and treatment of chemical warfare casualties . . . . . E-4
- .60 Biological warfare and functional understanding of isolation techniques and control of epidemics . . . . . E-6

QUALIFICATIONS FOR ADVANCEMENT

Required for  
Advancement to  
HM

H. CLINICAL LABORATORY

1.00 Practical Factors

.01 Perform elementary laboratory procedures, such as urinalysis, blood counts and preparation of smears . . . . . E-4

2.00 Examination Factors

.01 Principles of urinalysis, blood counts and staining . . . . . E-4

I. CLERICAL FORMS AND PROCEDURES

1.00 Practical Factors

.01 Typewrite for 5 minutes at 20 words a minute (See Performance Test Instructions) . . . . . E-4

.40 Prepare official correspondence and routine official reports . . . . . E-5

.80 Assemble statistical data and prepare comprehensive official reports . . . . . E-7

2.00 Examination Factors

.01 Health record entry procedures . . . . . E-4

.02 Medical department blank forms and their identification and preparation . . . . . E-4

.40 Preparation, routing and classification of correspondence . . . . . E-5

.41 Coast Guard standard filing methods . . . . . E-5

.60 Preparation of official forms other than those of the medical department . . . . . E-6

.61 Personnel records and accounting; preparation of patient admission records; service records; messages; reenlistment procedures and records; reports, correspondence and messages concerned with the care of the dead . . . . . E-6

.62 Medical department supplies, property accounting, budgets and other financial procedures . . . . . E-6

J. ADMINISTRATION AND ORGANIZATION

1.00 Practical Factors

.60 Supervise medical department storeroom or office section . . . . . E-6

.61 Supervise procurement of provisions . . . . . E-6

.62 Supervise medical records office of ship or station . . . . . E-6

.63 Prepare and deliver lectures on venereal disease preventive measures and first aid . . . . . E-6

2.00 Examination Factors

.60 Standard medical department organization on ship or shore station . . . . . E-6

.61 Standard organization of headquarters and district medical divisions . . . . . E-6

.80 Medical department administration: interpretation and application of instructions pertaining to the medical department contained in the Medical Manual (CG-294), Personnel Manual (CG-207), Exchange Manual (CG-309), Comptroller Manual (CG-264) and DOD-HEW Joint "Medicare" Directive . . . . . E-7

**★ SENIOR CHIEF HOSPITAL CORPSMAN (HMCS)**

**QUALIFICATIONS FOR ADVANCEMENT**

**Required for  
Advancement to  
HM**

**1.00 Practical Factors**

None.

**2.00 Examination Factors**

- |   |     |
|---|-----|
| .90 Personnel management and administration . . . . .                   | E-8 |
| .91 Early treatment and medical management of mass casualties . . . . . | E-8 |
| .92 Supervision of the Records Management Program . . . . .             | E-8 |
| .93 Medical Department equipage and furnishings requirements . . . . .  | E-8 |

**★ MASTER CHIEF HOSPITAL CORPSMAN (HMCM)**

**QUALIFICATIONS FOR ADVANCEMENT**

**1.00 Practical Factors**

None.

**2.00 Examination Factors**

- |   |     |
|---|-----|
| .95 Medical Department orientation . . . . .  | E-9 |
| .96 Medical Department training opportunities for enlisted personnel,<br>including schools and correspondence courses . . . . .                               | E-9 |
| .97 Functions of medical element of a disaster control unit: general,<br>medical service, casualty sorting, medical supplies, and<br>communications . . . . . | E-9 |

**CORRELATION  
TABLE**

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★ APPENDIX A

CORRELATION TABLE FOR AVIATION SURVIVALMAN (ASM)

ASM Number	Corresponding Numbers		ASM Number	Corresponding Numbers	
	PR	AO		PR	AO
A1.01	A1.01	New	E1.40	E1.40	+C1.03
A1.39a	New	A1.39a	E1.41	E1.41	+C1.02
b	New	b	E1.60	E1.60	New
c	New	c	E1.61	E1.61	New
d	A1.40	New	E1.62	New	New
A1.80	A1.80	New			
A1.81	New	A1.81	F1.01	New	E1.01
			F1.40	New	+E1.02
B1.01	B1.02	New	F1.41	New	+E1.03
B1.02	B1.03	New	F1.42	New	E1.40
B1.03	B1.04	New	F1.43	New	E1.41
B1.40	B1.40	New	F1.44	New	E1.42
B1.60	B1.80	New	F1.60	New	E1.60
B1.81	B1.81	New	F1.80	New	E1.80
C1.01	C1.01	New	G1.01	New	F1.01
C1.02	C1.02	New	G1.40	*+E1.03	+F1.02
C1.03	C1.03	New	G1.41	New	F1.40
C1.04	C1.04	New	G1.60	New	F1.60
C1.40	C1.40	New	G1.61	New	F1.61
C1.41	C1.41	New			
C1.42	C1.42	New	H1.01	*E1.03	G1.01
C1.43	C1.43	New	H1.40	New	G1.40
C1.60	C1.60	New	H1.60	New	G1.60
C1.61	#C1.80	New	H1.80	New	G1.80
D1.01	D1.01	C1.01	J1.01	New	I1.01
D1.40	D1.41	+C1.03	J1.40	New	I1.40
D1.41	D1.42	New	J1.60	New	I1.60
D1.42	D1.43	New			
D1.60	#D1.81	+C1.40	K1.01	F1.01	New
			K1.02	F1.02	New
E1.01	E1.01	C1.01	K1.03	D1.02	New
E1.02	E1.02	New	K1.04	D1.03	New
E1.03	E1.03	E1.01	K1.40	F1.40	New
E1.04	*D2.01	C1.01	K1.41	F1.41	New
E1.05	#D1.41	C1.03	K1.60	F1.60	New
	#D1.42		K1.61	F1.61	New
			K1.62	#D1.80	New

NOTES: # Downgraded - The old qualification item has been made a requirement for advancement to a lower paygrade.  
 + Upgraded - The old qualification item has been made a requirement for a higher paygrade. Personnel who have completed these factors are to be credited for having done so on Form CG-3303C.  
 \* Substantially Revised - All such items have been revised to an extent that requalification is required.



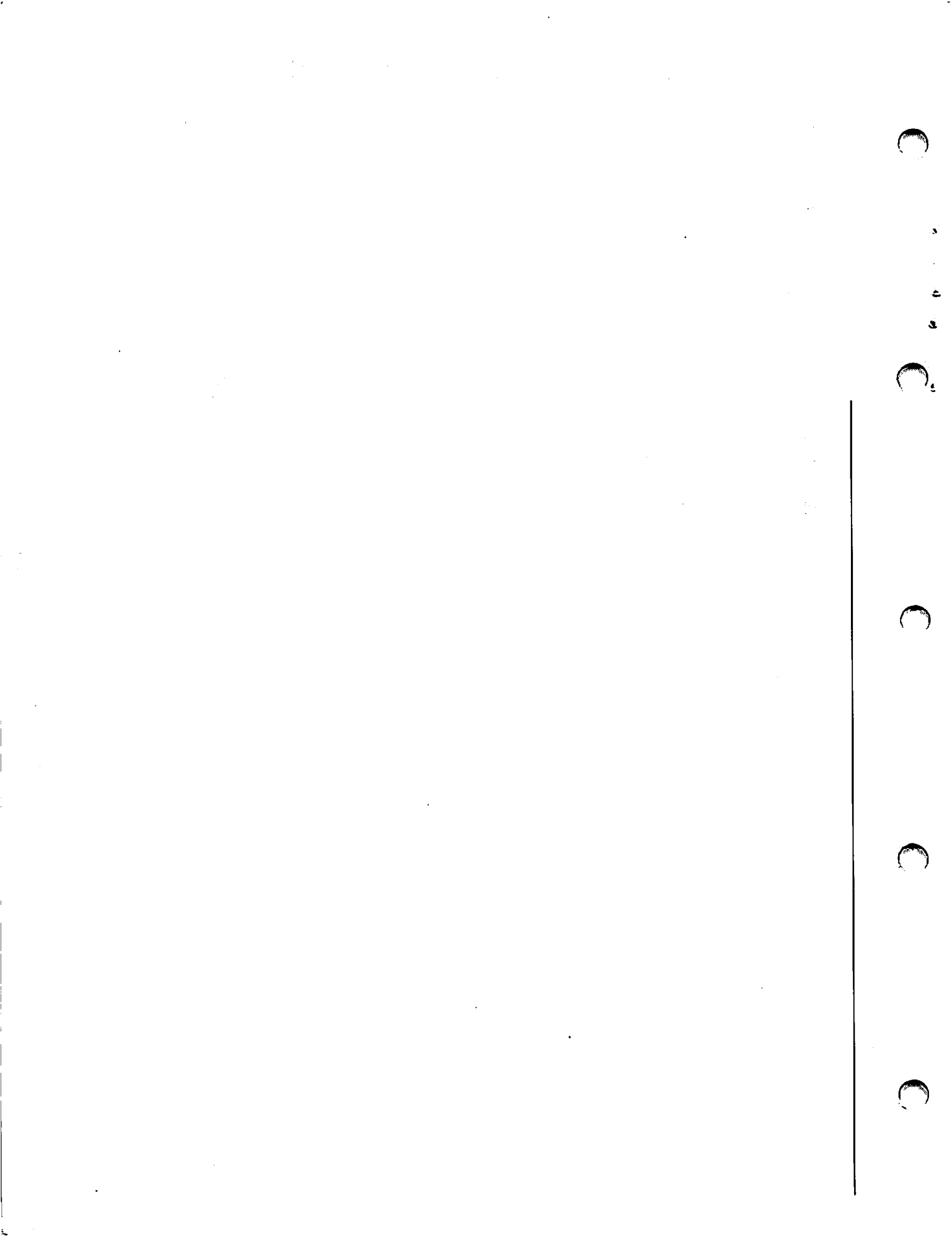
CORRELATION TABLE FOR ASM - Continued

ASM Number	Corresponding Numbers	
	PR	AO
L	New	New
M1.01	New	New
M1.02	G1.01	J1.01
M1.40	G1.40	J1.40
M1.41	G1.41	J1.41
M1.60	G1.60	J1.62
M1.61	G1.61	J1.61
M1.62	G1.63	New
M1.63	New	#J1.80
M1.64	G1.64	J1.60
M1.65	#G1.80	#J1.83
M1.66	#G1.81	New
M1.67	#G1.82	#J1.81
M1.80	G1.83	New
M1.81	G1.84	New
M1.82	New	J1.82
M1.83	*G2.84	*J2.84

★ CORRELATION TABLE FOR MARINE SCIENCE TECHNICIAN (MST)

<u>MST NUMBER</u>	<u>AG NUMBER</u>	<u>MST NUMBER</u>	<u>AG NUMBER</u>
A1.01	New	E1.41	New
A1.02	New	E1.42	E1.40
A1.40	New		E1.41
A1.80	New		#E1.60
			#E1.61
			#E1.62
B1.01	B1.01		
B1.02	F1.01		
B1.03	New	E1.60	New
B1.04	B1.03	E1.80	New
B1.05	#B1.40	E1.81	New
B1.06	B1.02	E1.82	New
B1.40	#B1.60	E1.83	New
C1.01	C1.01	G1.40	F1.40
C1.02	New		#F1.60
C1.40	C1.40	G1.80	F1.81
C1.41	New		F1.82
C1.60	New		
D1.01	New		
D1.02	D1.01		
E1.01	New		
E1.02	E1.01		
E1.03	New		
E1.40	New		

#Downgraded - The old qualification item has been made a requirement for advancement to a lower paygrade.



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