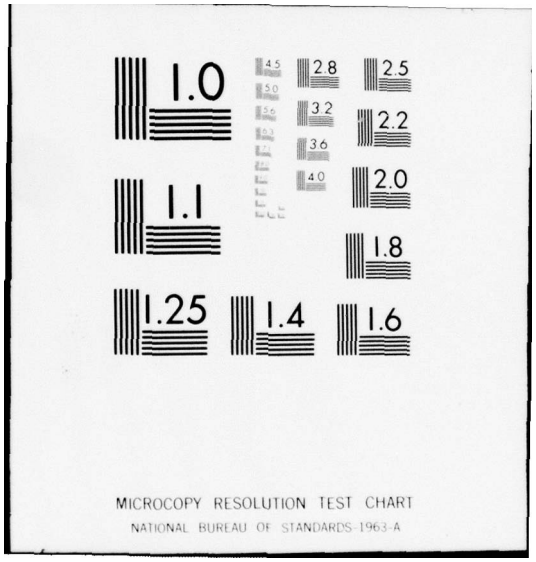
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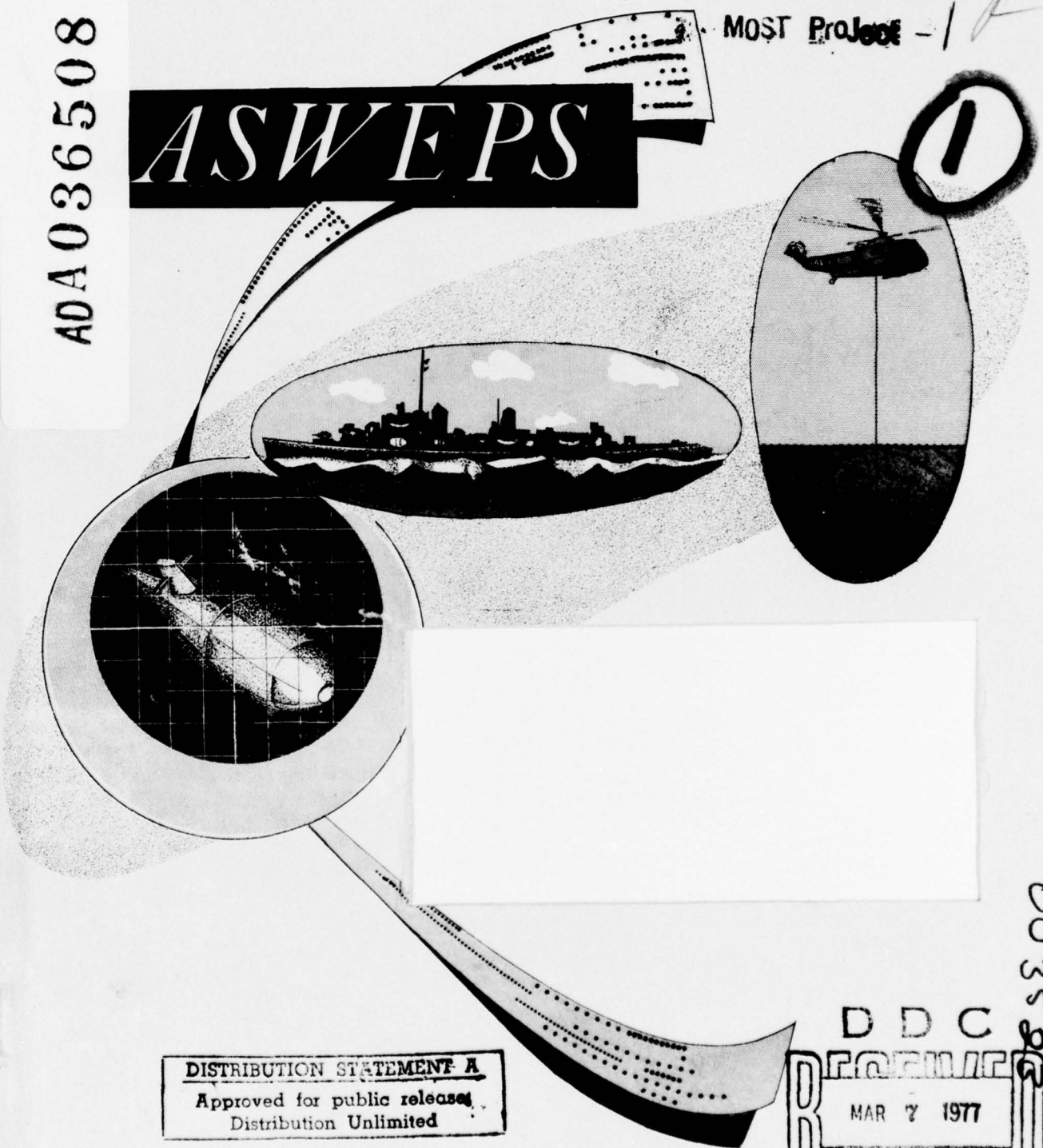

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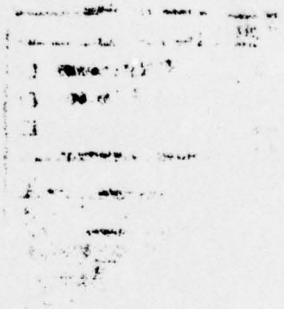
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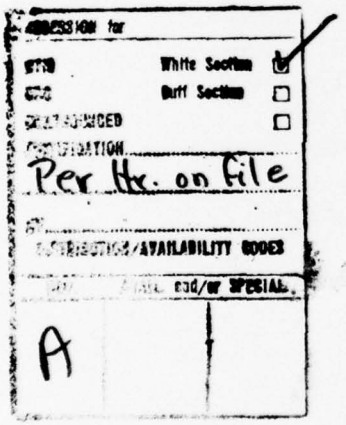
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SUBSYSTEM TWO -
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Although personnel research memoranda in the area of new weapons and support systems contain the best available preliminary information, some revisions may be required as the technical development of the systems progresses.

The conclusions and recommendations advanced are for information purposes. Policy considerations as well as planning factors are applied prior to implementation. Therefore, these are not to be considered official policy or to indicate final courses of action by the Bureau of Naval Personnel.

SUMMARY

A. BRIEF

This Systems Analysis contains preliminary predictions of manpower requirements, duty specifications, and training requirements for officer, enlisted, and civilian personnel to be assigned to Subsystems One and Two for the Service Test phase of ASWEPS. The information presented in this report was developed through analysis and evaluation of pertinent technical data and interviews with personnel of the U. S. Naval Hydrographic Office, which is the lead bureau responsible for technical development of the ASWEPS program.

B. CONCLUSIONS AND RECOMMENDATIONS

Conclusions:

1. Subsystems One and Two of ASWEPS, to a large extent, will use presently existing officer and crew complements to supervise, operate, and maintain the instruments, as well as to collect observational data on ships and aircraft participating in the Service Test phase.

2. In order to implement the ASWEPS Service Test phase, the following training requirements for military and civilian personnel will be imposed.

Supervisory Personnel	288
Operator and Maintenance Personnel	350

3. It will be necessary to increase the crew complement of certain types of participating vessels in order to absorb the additional work-load imposed by ASWEPS requirements. A listing of the required crew augmentation by rate and by type of vessel is as follows:

USN Radar Picket-Barrier Ships,
SO(G)-2 or SO(G)-3 12

Destroyers,
SO(G)-2 or SO(G)-3 24

Aircraft Carriers,
AG-2 or AG-3 3

USCG Ocean Station Vessels,
SO(G)-2 or SO(G)-3 21

4. Civilian personnel of the Navy Hydrographic Office will be used to operate and maintain instruments mounted on the Research Tower and Oceanographic Shore Stations. The personnel will work in rotating shifts and will perform other duties at the Hydrographic Office when not assigned to the sites. The total number of personnel required is estimated at fourteen (14).

5. Present planning anticipates the use of U. S. Coast Guard Patrols for maintenance of the Oceanographic Buoys to be used in Subsystem One.

Recommendations:

1. This JTA recommends that no new ratings, NEC's, or NOBC's be established for personnel employed in Subsystems One and Two of the ASWEPS Service Test phase. The duties involved in the procedures, operations, and maintenance of the subject Subsystems fall generally within the purview of established Classification Systems. The personnel predictions in this study are established only for the Service Test phase, and it is not anticipated that the number of personnel or amount

of training involved will be sufficiently large to justify the establishment of new Classification Systems. If at a later time ASWEPS is adapted for Fleet use, it may be feasible to develop new Classification Systems. This, however, should be the subject of a future and separate study.

2. It is recommended that special training programs be established for personnel in order to qualify them in the supervision, operation, and maintenance of ASWEPS instruments and procedures to be used in the Service Test phase. This training should be divided into three general catagories:

1. Training for Shipboard Personnel
2. Training for Aircraft Personnel
3. Training for Research Tower and Shore Station Personnel (Civilians)

The training for categories (1) and (2) should be in the form of classroom and practical instruction given at established Navy training facilities and/or on-site facilities. The training for civilian personnel who will operate and maintain the equipment on the Research Tower and Shore Stations, category (3), should be in the form of On-the-Job Training given by the Hydrographic Office.

3. The number of personnel recommended for specialized training in each category is as follows:

SHIPBOARD PERSONNEL

Supervisory Personnel

ASW Officers and Assistants	96
Operations Officers and Assistants	24
Supervisors and Assistants for Transit Vessels (MSTS and Fleet)	68
Submarine Officers and Assistants	12
Electronics Maintenance Officers and Assistants (CG)	24
TOTAL:	224

Operator and Maintenance Personnel

SO(G)-2 or SO(G)-3	162
AG-2 or AG-3	24
SO(SS)-2 or SO(SS)-3	12
QM(SS)-2 or QM(SS)-3	12
ET-2 or ET-3	24
Civilian (MSTS)	20
TOTAL:	254

AIRCRAFT PERSONNEL

Supervisory Personnel

Patrol Plane Commanders and Assistants	22
Anti-Submarine Pilots and Assistants	24
Helicopter Anti-Submarine Pilots	18
TOTAL	64

Operator and Maintenance Personnel

AT-2 or AT-3	46
SO(A)-2 or SO(A)-3	36
TOTAL:	82

RESEARCH TOWER AND SHORE STATION PERSONNEL

Operator and Maintenance Personnel (Civilian)

Research Tower	8
Shore Stations	6
TOTAL:	14

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INTRODUCTION

PURPOSE

This Systems Analysis is designed to present a preliminary prediction of manpower requirements, billet duty descriptions, selection criteria and training requirements for personnel who will supervise and operate the instruments of Subsystems One and Two of ASWEPS. The personnel information developed by this report is intended to provide source data required to assist the Chief of Naval Personnel and Fleet Units in personnel management activities related to ASWEPS such as. Establishing personnel selection requirements, determining training objectives and requirements, allocating duties among billets and stations, establishing training programs, and predicting manpower requirements.

A previous Systems Analysis has been published entitled, "The Overall Scope of Personnel Research and Management Requirements of ASWEPS". Subsequent reports will cover the remaining six Subsystems of ASWEPS. The first Systems Analysis states in general terms the overall personnel and training requirements for ASWEPS, the present report will treat these matters in more detail and will be limited to the requirements of Subsystems One and Two. A final, comprehensive Systems Analysis is planned for completion in 1964 which will combine all preliminary findings in a master report.

This Systems Analysis is designed to forecast personnel and training requirements based on the presently known and projected plans of ASWEPS. It will be subject to change depending on scientific and technical advances, with such changes being incorporated in the final Systems Analysis.

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APPENDIX 125

APPROACH

The information in this report has been gathered from two primary sources--the U. S. Navy Hydrographic Office and the Bureau of Naval Personnel. Interviews have been conducted with numerous Hydrographic Office personnel, primarily those in the Oceanographic Prediction Division and the Instrumentation Division. These interviews have yielded information regarding the design and function of ASWEPS instruments, descriptions of operator's duties, stages of development of the instruments, and the over-all mission, function, and organization of Subsystems One and Two. Interviews with various representatives of BUPERS have yielded information regarding personnel selection criteria, training programs and requirements, and billet identification. A large number of publications have also been studied which include: Instrument proposals, instrument instruction books, technical manuals, training manuals, and the ASWEPS Technical Development Plan.

Special mention should be made of the assistance given by Mr. J. J. Schule, Director, Oceanographic Prediction Division and his technical staff for general administration and technical guidance for specific scientific data as it is being developed in the research and development phase and as it will be applied during the Service Test phase.

SCOPE OF THIS REPORT

This report has been divided into two general sections, Part I describes the over-all purpose, function and organization of Subsystems One and Two of ASWEPS. It describes in detail the platform on which oceanographic instruments will be mounted and the instruments which will be mounted on the various platforms. It analyses manpower and training requirements by platform. It describes the categories of personnel, such as Coast Guard, Navy and Civilian, who will supervise and operate the instruments. It also contains a functional breakdown of the instrumentation in categories which lend themselves readily to the establishment of training groups.

Part II consists of supervisor and operator duty descriptions for the instruments to be used in Subsystems One and Two. The duty descriptions include such pertinent data as the platform(s) on which the instrument is mounted, a description of the instrument, recommended rating/rate or grade of the operator or supervisor, recommended NEC or NOBC where applicable, and recommended special training and recommended selection requirements where applicable. Each duty description also contains a breakdown by rating/rate or grade of the numbers of men who should be trained in the supervision or operation of the particular instrument(s).

DEFINITION OF ITEMS IN THE BILLET DESCRIPTIONS

A definition and description of the type of information which appears in each item of the billet descriptions follow in outline form.

DUTY TITLE: A short descriptive title identifying the instrument to be operated or the supervisory billet.

PLATFORM: Ships, aircraft, submarines, the Research Tower, Oceanographic Shore Stations and/or anchored buoys on which ASWEPS instruments will be mounted.

RECOMMENDED GRADE: (Included only in officer billet descriptions.) The grade(s) recommended as most appropriate for officers assigned to the duty described.

RECOMMENDED RATING/RATE: The rating and rate recommended as most appropriate for enlisted personnel assigned to operate the instrument described.

RECOMMENDED ALTERNATE RATING/RATE: When the instrument described is mounted on more than one type of platform and a second rate is recommended, it will be listed here.

RECOMMENDED NOBC: (Naval Officer Billet Classification): The NOBC codes recommended for each billet description were taken from the Manual of Navy Officer Billet Classifications, NavPers 15839.

RECOMMENDED NEC: (Navy Enlisted Classification): The NEC codes in the enlisted duty descriptions were taken from the Manual of Navy Enlisted Classifications, NavPers 15105A. When no NEC code is shown, the recommended rate provides sufficient identification.

INSTRUMENT DESCRIPTION: A brief summary of the instrument's function and its physical description.

DUTY DESCRIPTION: A detailed description of the duties performed in the supervision or operation of the instrument involved. Enlisted duty descriptions are subdivided into installation, operation, and maintenance duties.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

   A. The specialized training necessary to instruct the supervisor or operator in the supervision and operation of the subject instrument(s).

   B. A listing of the number of men by platform and rate or grade who will require training in the operation of the subject instrument(s) in order to fulfill ASWEPS requirements.

2. Selection Criteria -

Any factors which would aid in the selection of personnel to hold the billet. This is noted only where such factors differ from those implicit in the recommended rating/rate or grade (If, for example, the recommended rating/rate is SO(G)-2, it may be assumed that this man has completed Class "A" Sonar School and met the physical and mental qualifications to hold that rate).

PART I

A BREAKDOWN OF SUBSYSTEMS ONE AND TWO BY PLATFORMS, INSTRUMENTS, AND GENERAL PERSONNEL REQUIREMENTS

DEFINITION

PLATFORM IS A GENERAL TERM WHICH APPLIES TO SHIPS, AIRCRAFT, SUBMARINES, RESEARCH TOWER, OCEANOGRAPHIC SHORE STATIONS, AND/OR ANCHORED BUOYS ON WHICH ASWEPS DATA GATHERING INSTRUMENTS WILL BE MOUNTED.

GENERAL CONSIDERATIONS

Information collected by the instruments of Subsystems One and Two will be transmitted to the Environmental Data Processing Unit, the Sea-Based Data Processing Unit, and/or the On-Site Conversion Display Unit, where such information will be collected and transmitted ultimately to Fleet users.

Subsystems One, The Regional Oceanographic Net, will be composed of the following platforms:

1. Twenty-one USCG Ocean Station Vessels
2. Twelve USN Radar Picket-Barrier Ships
3. Thirty-four Navy Vessels (transit)
4. Twelve Oceanographic Buoys
5. One Research Tower
6. Five Reconnaisance Aircraft
7. Two Oceanographic Shore Stations (tentative)

Subsystem Two, The Mobile Oceanographic Net, will be composed of the following platforms:

1. Twelve Carrier-Based Aircraft
2. Eighteen Carrier-Based Helicopters
3. Six Land-Based ASW Patrol Aircraft
4. Three Aircraft Carriers (CVS)
5. Twenty-four Destroyers (DD)
6. Six Submarines (SS)

The following sensing instruments, as listed in the ASWEPS Technical Development Plan, are planned for installation on the above platforms. For the purpose of clarification, the list of instruments may be categorized by type of platform, as follows:

A. Shipboard Mounted Instruments (Shipboard Platforms)

1. Bathythermograph, Mechanical

2. Bathythermograph, Electronic (Shipboard)
3. Surface Thermograph
4. Recording Radiometer
5. Sound Velocity Meter
6. High Speed Instrument Package
7. Fathometer
8. Shipboard Wave Recorder
9. Turbidity Depth Meter
10. Ambient/Self Noise Meter
11. Shipboard Sensor Package
12. Temperature/Salinity Depth Recorder
13. Topside Echosounder

B. Aircraft Mounted Instruments (Aircraft Platforms)

1. Bathythermograph, Electronic (Expendable)
2. Airborne Radiation Thermometer
3. Sonobuoy
4. Airborne Sea/Swell Recorder
5. Standard Sound Source
6. Airborne Sensor Package
7. Bathythermograph, Mechanical (Helicopters only)

C. Miscellaneous Mounted Instruments (Stationary Platforms)

1. Research Tower
   - Turbidity-Depth Meter
   - Thermocline Recorder
   - Current Meter
   - Recording Radiometer
   - Tide Guage
   -Temperature/Salinity Depth Recorder

2. Anchored Oceanographic Buoys
   - Sensor Package

3. Oceanographic Shore Stations
   - Sound Level Recorder
   - Tide Guage

SHIPBOARD PLATFORMS

The area in which the largest number of personnel will be required is in the operation and maintenance of instruments on Shipboard Platforms. It is in this area that the largest number and greatest variety of instruments appear. Shipboard-mounted instruments will require part-time operation, maintenance, and supervision. A single instrument will require from one to three hours daily operation and maintenance.

It will be noted that the number of instruments varies according to the type of vessel. A breakdown of types of vessels and numbers of instruments per vessel shows:

USCG Ocean Station Vessels - Eight Instruments
USN Radar Picket-Barrier Ships - Eight Instruments
MSTS and Fleet Units - Three Instruments
Aircraft Carriers (CVS) - Four Instruments
Destroyers (DD) - Six Instruments
Submarines (SS) - Three Instruments

USCG Vessels, USN Radar Picket Ships, Aircraft Carriers, and Destroyers will require additional personnel.

In order to determine the number of additional personnel required for a certain type of vessel the following calculations were used: An average of two man-hours per day is required to operate one oceanographic instrument; and a given vehicle carries a total of eight instruments. It will, therefore, require sixteen man-hours per day to take the necessary observations.

These figures indicate that the existing crews of these types of vessels will require an increase of two men each in order to accomplish the oceanographic observations required.

With the aid of technical engineers, a figure for average daily operating time has been worked out for each instrument. By applying that figure to the calculations described above, general personnel estimates have been made for each type of vessel in Subsystems One and Two.

Regardless of whether or not the crew of a given type of vessel requires additional personnel, all vessels will require trained men to operate the ASWEPS instruments. A minimum of two men should be trained for each vessel. This is the basis for the figures shown on the following pages under "Number of Men to be Trained". If additional personnel are considered necessary, another heading is used, "Additional Personnel Requirements".

In considering the numbers of supervisory personnel and assistants (officers and senior petty officers) required for these vessels, it has been determined that average operating time per instrument is not pertinent. The officer and his assistant will be required to have some knowledge of each instrument on the vessel and of the system in general, and to this end a specialized course of training for officers and assistants is recommended. Supervisors and assistants have been apportioned on the basis of one supervisor and one assistant per vessel. This is considered to be an absolute minimum compatible with mission requirements.

There follows a list of each type of vessel to be employed in ASWEPS, the instruments on each vessel, recommended ratings for operation, and maintenance personnel, the recommended crew additions, and the training requirements.

USN Radar Picket-Barrier Ships

Twelve USN Radar Picket-Barrier Ships will be employed in the ASWEPS Service Test, each of which will mount a total of eight oceanographic instruments:

Instruments to be operated by Sonarmen (SO)

1. Bathythermograph, Mechanical
2. Bathythermograph, Electronic, Shipboard
3. Surface Thermograph
4. Turbidity Depth Meter
5. Sound Velocity Meter
6. Ambient/Self Noise Meter

Instruments to be operated by Aerographer's Mates (AG)-

7. Shipboard Wave Recorder
8. Recording Radiometer

Using the calculations described in the preceding section of this report, it has been determined that the six instruments to be operated by SO's will require an average operating time of seven man-hours per day per vessel, and that the two instruments operated by AG's will require an average operating time of six man-hours per day per vessel. On the basis of these figures it is estimated that each ship should have its existing crew complement increased by one SO in order to absorb the additional work load imposed by ASWEPS requirements. It is recommended that one additional man be trained in each rating for each vessel in order to provide for better distribution of duties.

Additional Personnel Required

SO(G)-3 12

TRAINING REQUIREMENTS

Technical and Supervisory Personnel

Operations Officers (LT, LTJG, or ENS)...	12
Assistants (Senior Petty Officers).....	12
TOTAL:	24

Operation and Maintenance Personnel

SO(G)-2 or SO(G)-3	24
AG-2 or AG-3	24
TOTAL:	48

GRAND TOTAL: 72

Destroyers

Twenty-four Destroyers are scheduled to participate in the ASWEPS Service Test, each of which will mount five instruments. All of these instruments will be operated by Sonarmen (SO):

1. Bathythermograph, Mechanical
2. Ambient/Self Noise Meter
3. Fathometer with bottom reflection meter
4. Surface Thermograph
5. High Speed Instrument Package

These instruments will require an estimated average operating time of eight man-hours per day per vessel, which indicates a necessity to increase the crew of each Destroyer by one SO in order to fulfill ASWEPS requirements. It is recommended that one additional man be trained for each Destroyer in order to provide for better distribution of duties.

Additional Personnel Required

SO(G)-2 or SO(G)-3 24

TRAINING REQUIREMENTS

Technical and Supervisory Personnel

ASW Officers (LT, LTJG, or ENS)	24
Assistants (Senior Petty Officers).....	24
TOTAL:	48

Operation and Maintenance Personnel

SO(G)-2 or SO(G)-3 48

GRAND TOTAL 96

Submarines

Six Submarines will participate in the ASWEPS Service Test, each of which will mount three oceanographic instruments.

Instruments to be operated by Sonarmen (SO(SS))

1. Temperature/Salinity Depth Recorder
2. Turbidity Depth Meter

Instrument to be operated by Quartermaster (QM(SS))

3. Topside Echosounder

It has been determined that the two instruments operated by SO(SS)'s will require an estimated average operating time of four man-hours per day per vessel and that the instrument operated by QM (SS)'s will require an average operating of two hours per day. These operating requirements are considered to fall within the capacity of existing crew complements and no additions will be required in either rate. It is recommended that two men per rate per vessel be trained in the operation of the applicable instrument.

TRAINING REQUIREMENTS

Technical and Supervisory Personnel

Operations Officer (LT, LTJG, or ENS)....	6
Assistants (Senior Petty Officers).....	6
TOTAL:	12

Operation and Maintenance Personnel

SO(SS)-2 or SO(SS)-3.....	12
QM(SS)-2 or QM(SS)-3.....	12
TOTAL:	24

GRAND TOTAL: 36

MSTS and Fleet Units

The ASWEPS Service Test will employ thirty-four transit ocean vessels, of which ten will be MSTS ships and twenty-four will be USN units. Each of these vessels will mount three instruments:

1. Bathythermograph, Mechanical
2. Surface Thermograph
3. Recording Rasiometer

On MSTS ships all instruments will be operated by civilian crew members, and on USN fleet units all instruments will be operated by Sonarmen (SO). The average operating time is estimated at six man-hours per day per vessel, which is considered to be within the capacity of existing crew complements. The figures presented below are the estimated number of Operation and Maintenance Personnel and Supervisory Personnel who should be trained in order to fulfill ASWEPS requirements. These figures are predicated on the basis of two operators, one supervisor, and one assistant per vessel.

TRAINING REQUIREMENTS

Supervisory and Technical Personnel

Civilian Ships' Officers	10
Assistants	10
Operations Officers (LT, LTJG, or ENS)	24
Assistants (Senior Petty Officers)	24
TOTAL:	68

Operation and Maintenance Personnel

Civilians	20
SO(G)-2 or SO(G)-3	48
TOTAL:	68

GRAND TOTAL: 136

U. S. Coast Guard Ocean Station Vessels

It is not strictly within the purview of this report to recommend manpower and training requirements for USCG, but since USCG personnel will be trained in Navy facilities, and in order to present a more comprehensive picture of the entire personnel situation, USCG requirements are provided.

The U. S. Coast Guard is scheduled to provide twenty-one Ocean Station Vessels (weather ships) for participation in the ASWEPS Service Test. Each of these vessels will carry eight oceanographic instruments, all of which will be operated by Sonarmen (SO).

1. Bathythermograph, Mechanical
2. Bathythermograph, Electronic, Shipboard
3. Surface Thermograph
4. Turbidity Depth Meter
5. Sound Velocity Meter
6. Ambient/Self Noise Meter
7. Shipboard Wave Recorder
8. Recording Radiometer

The average estimated total operating time for these instruments is ten man-hours per day per vessel which indicates the necessity of increasing the existing crew complement of each vessel by one SO in order to fulfill the additional work-load requirements imposed by ASWEPS.

At least one additional trained operator should be on board each vessel for better distribution of duties. This would provide a total of two trained operators on each vessel.

Additional Personnel Required

USCG, SO(G)-2 or SO(G)-3 21

TRAINING REQUIREMENTS

Supervisory and Technical Personnel

USCG ASW Officers (LT, LTJG, or ENS).....	21
Assistants (Senior Petty Officers).....	21
TOTAL:	42

Operation and Maintenance Personnel

USCG, SO(G)-2 or SO(G)-3..... 42

GRAND TOTAL: 84

AIRCRAFT PLATFORMS

Four categories of aircraft will be employed in the ASWEPS Service Test:

Land-Based Oceanographic Reconnaisance Flights (5 aircraft)
Land-Based ASW Patrol Aircraft (6 aircraft)
Carrier-Based ASW Aircraft (12 aircraft)
Carrier-Based ASW Helicopters (18 aircraft)

ASWEPS will use existing flying organizations and crews and will not require the activation of new flying organizations, nor is it anticipated that ASWEPS will be assigned specific aircraft for exclusive ASWEPS use within these organizations. All aircraft will fly missions which include oceanographic observations in addition to the fullfillment of other requirements. In considering manpower requirements for aircraft, there exists a different set of circumstances from those which pertain to shipboard instrumentation.

It is not considered feasible to attempt an increase in the crew of a given aircraft due to space and weight limitations. The factor to be considered is not the time which will be spent by an operator in taking oceanographic observations, but the number of aircraft which will be involved in flying ASWEPS missions. It is recommended that at least two operators be trained for each aircraft flying ASWEPS missions, to allow for rotation and better distribution of crew duties. One pilot officer and one assistant, either a junior officer or senior petty officer, should be trained for each aircraft to perform supervisory and technical functions.

There follows a listing of each category of aircraft involved in Subsystem One and Two showing the number of aircraft to be employed in each category, the instruments carried by each type of aircraft, and the number of operator and supervisory personnel required to be trained.

Land-Based Oceanographic Reconnaisence Flights

Number of Aircraft: Five (5), P2V

Instruments Carried:

1. Bathythermograph, Expendable, Electronic
2. Airborne Sea-Swell Recorder
3. Airborne Radiation Thermometer
4. Sonobuoy with Standard Sound Source

Supervisor and Technical Personnel to be Trained:

Patrol Plane Commanders	5
Assistants	5
TOTAL:	10

Operator and Maintenance Personnel to be Trained (two per aircraft):

AT-2 or AT-3	10

GRAND TOTAL: 20

(32)

Land-Based ASW Patrol Aircraft

Number of Aircraft: Six (6), P2V

Instruments Carried:

1. Bathythermograph, Expendable, Electronic
2. Airborne Sea-Swell Recorder
3. Airborne Radiation Thermometer
4. Sonobuoy with Standard Sound Source

Supervisor and Technical Personnel to be Trained:

Patrol Plane Commanders	6
Assistants	6
TOTAL:	12

Operator and Maintenance Personnel to be Trained (two per aircraft):

AT-2 or AT-3	12

GRAND TOTAL: 24

Carrier Based ASW Aircraft

Number of Aircraft: Twelve (12), S2F

Instruments Carried:

1. Bathythermograph, Expendable, Electronic
2. Airborne Radiation Thermometer
3. Sonobuoy with Standard Sound Source

Supervisor and Technical Personnel to be Trained:

Anti-Submarine Pilots	12
Assistants	12
TOTAL:	24

Operator and Maintenance Personnel to be Trained (two per aircraft):

AT-2 or AT-3.....	24

GRAND TOTAL: 48

NOTE: The S2F Aircraft carries a crew of two pilots and two enlisted crewmen, so that the above figures would show the necessity of training the entire crew of the aircraft.

Carrier-Based ASW Helicopters

Number of Aircraft: Eighteen (18), HSS

Instruments Carried:

1. Bathythermograph, Mechanical (modified)

Supervisor and Technical Personnel to be Trained:

Helicopter Anti-Submarine Pilots 18

Operator and Maintenance Personnel to be Trained (two per Aircraft):

SO(A)-2 or SO(A)-3 36

GRAND TOTAL: 54

NOTE: The HSS Helicopter carries a crew of two pilots and two crewmen. Since only one ASWEPS instrument is carried on this vehicle, only two crew-members need to be trained.

MISCELLANEOUS PLATFORMS

In addition to ships and aircraft, three other types of platforms will be employed in ASWEPS. A Research Tower, two Oceanographic Shore Stations, and twelve anchored oceanographic buoys equipped with sensor packages. The requirements for each of these platforms will be listed separately in the following pages. Manpower and training requirements for these three platforms differ from those for aircraft and ships. The Research Tower will be manned by Hydrographic Office civilian personnel. The oceanographic buoys will be unmanned and will automatically transmit collected data, but will, however, require periodic maintenance. It is presently planned that the maintenance of the oceanographic buoys will be performed by USCG patrols, so that the necessity will exist to train Coast Guard maintenance personnel and supervisors. Plans for the oceanographic shore stations are in an early stage of development, and it has not yet been determined if full-time manning of these platforms will be needed. If full-time manning is required, civilian personnel are recommended.

Research Tower

The Research Tower to be employed in the ASWEPS program will carry seven instruments:

1. Turbidity-Depth Meter
2. Thermocline Records
3. Wave Meter
4. Current Meter
5. Recording Radiometer
6. Tide Guage
7. Temperature/Salinity Depth Recorder

A minimum crew will be necessary to monitor the equipment and to perform first echelon maintenance. It is estimated that a total of eight men per year, used in rotating shifts of two men each, will be needed to man the Research Tower. (The figure is based on Hydrographic Office experience on Texas Tower Number Four.) These operators will be civilian employees of the Hydrographic Office who, when not assigned to shift duty on the tower, will perform other duties at the Hydrographic Office. It is recommended that if further training is required of these civilian employees, it be provided by the Hydrographic Office through On-the-Job Training. No distinction can be made between operators and supervisors for this platform since supervision will be general and will not take place at the operating level.

TRAINING REQUIREMENTS

Civilian Employees 8

Anchored Oceanographic Buoys

Subsystems One and Two will use twelve anchored oceanographic buoys in automatically transmitting collected data to appropriate Data Processing Units. The oceanographic buoy platform will contain transmission equipment and a sensor package which will combine a thermistor chain, an anemometer, and an air temperature thermometer. No operators are required for these platforms, but periodic maintenance will be necessary. Present plans call for the establishment of a contract with the U.S. Coast Guard to have the buoys serviced and maintained by Coast Guard Patrols. This will require the selection and training of maintenance and supervisor personnel in the Coast Guard. The following figures are a suggested level for selection and training. They are predicated on the basis of two trained men per buoy.

TRAINING REQUIREMENTS

USCG Maintenance Officers (LT, LTJG, or ENS.	12
Assistants (Senior Petty Officers)	12
TOTAL:	24
USCG, ET-2 or ET-3	24
GRAND TOTAL:	48

Oceanographic Shore Stations

Two Oceanographic Shore Stations are tentatively planned for inclusion in the ASWEPS program. It is anticipated that the platform will carry at least two instruments:

1. Sound Level Recorder
2. Tide Guage

Civilian technicians are recommended for operation and maintenance of these instruments. The data collected will be automatically telemetered to the Data Processing Unit, but maintenance will be required. It is estimated that four to six trained men, operating on a rotating shift basis, should be adequate for the operation and maintenance of these platforms. Training for these operators should be conducted by the Hydrographic Office.

PART II

SUBSYSTEMS ONE AND TWO
BILLET AND DUTY DESCRIPTION

GENERAL CONSIDERATIONS

This portion of the Systems Analysis will present a description of officer billets and duties, and an analysis of the individual instruments, operator duty descriptions, selection criteria and training requirements for Subsystems One and Two.

In this part of the report, each instrument and the personnel requirements related thereto are treated separately, regardless of whether they fall in one Subsystem or the other.

Special mention should be made of the fact that this report does not recommend the establishment of any new ratings, NEC's, or NOBC's. The personnel predictions are made only for the ASWEPS Service Test. The numbers of men and amount of training involved for the Service Test are not considered sufficiently large to justify the establishment of new classification systems. If at a later date ASWEPS is adopted for general Fleet use, it may be feasible to develop new classification systems. This, however, should be the subject of a separate and future study. In addition to the reasons just stated, it appears that the duties involved in the operation of Subsystem One and Two instrumentation fall generally within the purview of established rates and NEC's, and are in the SO, AG, AT and ET groups.

In Report Number One of this series the rate Sonarman, Oceanographer, (SO(O)), was recommended for the operation of certain instruments. Within the present study this has been eliminated and Surface Sonarman (SO(G)) substituted. This has been done inasmuch as further study has shown that the duties and training implicit in SO(O) and NEC 0411, while bearing a superficial resemblance, actually have little real relationship to the duties and training necessary for ASWEPS instrumentation. In addition, information gathered since the publication of Report Number One indicates that the rate SO(O) is soon to be disestablished.

It is recommended that the instrument operator be trained and relied upon to furnish first echelon maintenance to the equipment. For this reason no personnel have been designated specifically and exclusively as maintenance personnel, except in the case of Coast Guardsmen who will furnish maintenance for the Oceanographic Buoys. In the case of most of the instruments described herein, repair beyond the first echelon is not feasible due to the fact that ship or station facilities cannot accomodate necessary repair equipment. Furthermore, the training of operator personnel in the deeper aspects of complete instrument overhaul would impose additional and unnecessary training requirements. It is anticipated that instrument repair centers manned by civilian technicians will be established to which malfunctioning instruments will be forwarded.

Specialized courses of training must be established for most instruments since they are recently developed or to be developed, and no adequate training presently exists.

TRAINING REQUIREMENT ESTIMATES

FUNCTION	SUBSYSTEM ONE		SUBSYSTEM TWO	
	BREAKDOWN	TOTAL	BREAKDOWN	TOTAL
SCHOOL TRAINING:				
Operation and Maintenance		172		102
SO(G)-2, SO(G)-3	114		48	
AG-2, AG-3	24		6	
SO(SS)-2, SO(SS)-3			12	
AT-2, AT-3	10		36	
ET-2, ET-3 (USCG)	24			
Technical and Supervisory		66		54
ASW Officers	21		27	
Electronics Maintenance Officers (USCG)	12			
Assistant to ASW Officers	21		27	
Assistant to Electronics Maintenance Officers	12			
INFORMAL TRAINING:				
Operation and Maintenance		28		48
QM(SS)-2, QM(SS)-3			12	
SO(A)-2, SO(A)-3			36	
Civilian Technicians	28			
Technical and Supervisory		102		66
Operations Officers	36		6	
Patrol Plane Commanders	5		6	
Anti-Submarine Pilots			12	
Helicopter Anti-Submarine Pilots			18	
Civilian Ships' Officers	10			
Assistant to Operations Officers	36		6	
Assistant to Patrol Plane Commanders	5		6	
Assistant to Anti-Submarine Pilots			12	
Assistant to Civilian Ships' Officers	10			
TOTAL		368		270

SUGGESTED TRAINING
ASWEPS OFFICER PERSONNEL

TITLE	SITE	Billet Status	LEVEL	CURRICULA
ASW OFFICER	FLEET SONAR SCHOOL	Current	LT, LTJG, ENS	1. ASWEPS Orientation 2. ASWEPS Communication Procedures 3. ASWEPS Instrumentation 4. Procedures and Applications in Technical, Managerial, and Personnel Areas
OPERATIONS OFFICER CIVILIAN SHIPS' OFFICER	INSTRUMENT REPAIR AND CALIBRATION CENTERS	Current	LT, LTJG, ENS	1. ASWEPS Orientation 2. ASWEPS Communication Procedures 3. ASWEPS Instrumentation 4. Procedures and Applications in Technical, Managerial, and Personnel Areas
PATROL PLANE COMMANDER ANTI-SUBMARINE PILOT HELICOPTER ANTI-SUBMARINE PILOT	WING TRAINING OFFICERS SCHOOL (IN SITU)	Current	LT, LTJG, ENS	1. ASWEPS Orientation 2. ASWEPS Communication Procedures 3. ASWEPS Instrumentation 4. Procedures and Applications in Technical, Managerial, and Personnel Areas
USCG ELECTRONICS MAINTENANCE OFFICER	MANUFACTURER'S SCHOOL	Current	LT, LTJG, ENS	1. Repair and Maintenance Procedures for Oceanographic Buoy and Sensor Package

(917)

SUGGESTED TRAINING

ASWEPS ENLISTED PERSONNEL AND CIVILIAN TECHNICIANS

TITLE	SITE	RATING STATUS	LEVEL		CURRICULA
SONARMAN (SO(G)) SONARMAN (SO(SS))	SONAR SCHOOL	CURRENT	SOC SO-1	SO-2 SO-3	1. ASW APPLICATIONS 2. OCEANOGRAPHIC INSTRUMENTATION 3. ASWEPS PROCEDURES 4. SIGNAL PROCESSING TECHNIQUES 5. MANAGERIAL APPLICATIONS
SONARMAN (SO(A)) AVIATION ELECTRONICS TECHNICIAN (AT) CIVILIAN TECHNICIAN (MSTS)	IN SITU	CURRENT	SOC ATC SO-1 AT-1 CIVILIANS	SO-2 AT-2 SO-3 AT-3	1. ASW APPLICATIONS 2. OCEANOGRAPHIC INSTRUMENTATION 3. ASWEPS PROCEDURES 4. SIGNAL PROCESSING TECHNIQUES 5. MANAGERIAL APPLICATIONS
AEROGRAPHER'S MATE (AG)	SONAR SCHOOL	CURRENT	AGC AG-1	AG-2 AG-3	1. ASW APPLICATIONS 2. OCEANOGRAPHY - METEOROLOGY RELATIONSHIPS 3. OCEANOGRAPHIC INSTRUMENTATION 4. ASWEPS PROCEDURES 5. SIGNAL PROCESSING TECHNIQUES 6. MANAGERIAL APPLICATIONS
ELECTRONICS TECHNICIAN (ET-USCG)	MANUFACTURER'S SCHOOL	CURRENT		ETC ET-2 ET-1 ET-3	1. INSTRUMENT MAINTENANCE AND REPAIR
QUARTERMASTER (QM(SS))	IN SITU	CURRENT		QM-2 QM-3	1. ASWEPS PROCEDURES

THE FOLLOWING BILLET AND
DUTY DESCRIPTIONS ARE FOR THE
SUPERVISORY PERSONNEL OF SUB-
SYSTEMS ONE AND TWO OF ASWEPS.

DUTY TITLE: Anti-Submarine Warfare Officer

PLATFORM: Destroyers, USCG Ocean Station Vessels

RECOMMENDED GRADE: LT, LTJG, or ENS

RECOMMENDED NOBC: 9206

DUTY DESCRIPTION:

As officer in charge of the ASWEPS program aboard the Destroyer or USCG Ocean Station Vessel, the incumbent is responsible for planning, organizing, executing, coordinating, and directing all phases of the total mission. His responsibilities will be in the technical, managerial, and personnel areas.

Responsibilities in Technical Areas - Incumbent will be responsible for over-all supervision and guidance in all phases of the ASWEPS technical program. He will assure adequate accomplishment of all objectives, such as equipment installations, operations (including communications), and maintenance. He will assure that all ASWEPS instruments are properly installed and that all technical manuals, as required, are available. He will supervise the preparation of schedules for data collecting operations. He will make periodic inspections to provide assurance that operations are carried out in accordance with procedures as prescribed in operational and technical guides. He will supervise processing of observational data to insure its accuracy and completeness. He will make arrangements with the Communications Officer for the transmittal of observational data to Data Processing Centers. He will assure proper level of maintenance necessary for accurate operation of instrumentation.

Responsibilities in Managerial Areas - Incumbent is responsible for over-all supervision and guidance in all phases of ASWEPS management. He will assure adequate accomplishment of management objectives as contained in the following instructions:

1. Master Operational Plan of ASWEPS.
2. OPNAV Instructions and Clearances.
3. Service Test Operational Guide.
4. Quantity and Quality Control Procedures.
5. Procedures for sending or receiving instruments to or from repair and calibration centers or ordering new instruments from warehouses.
6. Procedures for operational progress reporting.

Responsibilities in Personnel Areas - Incumbent is responsible for personnel management within the framework of ASWEPS activities, i.e., recruitment, placement, training, utilization, and leave policies.

RECOMMENDED QUALIFICATIONS AND TRAINING:

Officers selected for this duty should receive specialized instruction which includes the over-all scope of ASWEPS functions and operations, and the technical, managerial, and personnel responsibilities imposed by the ASWEPS Service Test operation. The course should include training at the supervisory level in the installation, operation, and maintenance of ASWEPS equipment. Training should include indoctrination in the various detailed instructions pertaining to ASWEPS management and personnel management requirements.

The following figures represent the number of Anti-Submarine Warfare Officers who should be trained for assignment to each type of vessel:

Destroyers	24
USCG Ocean Station Vessels	21
TOTAL:	45

DUTY TITLE: Assistant to Anti-Submarine Warfare Officer

PLATFORM: Destroyers, USCG Ocean Station Vessels

RECOMMENDED RATING/RATE:
SOC or SO-1

RECOMMENDED ALTERNATE RATING/RATE:
AGC or AG-1

DUTY DESCRIPTION:

The incumbent will assist the officer in charge of the ASWEPS program aboard the Destroyer or USCG Ocean Station Vessel in planning, organizing, executing, coordinating, and directing all phases of the total mission. He will be directly responsible to the officer in charge in the technical area. He will exercise direct supervision of equipment installations, operations, and maintenance. He will supervise the installation of all ASWEPS instruments and obtain all technical manuals required. He will prepare schedules for data collecting operations and supervise preliminary processing of observational data to insure its accuracy and completeness. He will be responsible for seeing that completed data are compiled in proper form for forwarding to the officer in charge. He will prepare maintenance schedules and conduct periodic inspections to determine proper level of maintenance necessary for accurate operation of instrumentation.

RECOMMENDED QUALIFICATIONS AND TRAINING:

Petty officers selected for this duty should receive specialized instruction which includes the over-all scope of ASWEPS functions and operations, and the technical responsibilities imposed by the ASWEPS Service Test operation. The course should include training in the installation, operation, and maintenance of ASWEPS equipment.

The following figures represent the number of Petty Officers who should be trained for assignment to each type of vessel:

Destroyers	24
USCG Ocean Station Vessels	21
TOTAL:	45

DUTY TITLE: Operations Officer

ALTERNATE DUTY TITLE: Anti-Submarine Warfare Officer*

PLATFORM: USN Radar Picket-Barrier Ships

RECOMMENDED GRADE: LT, LTJG, or ENS

RECOMMENDED NOBC: 9274

RECOMMENDED ALTERNATE NOBC: 9206*

DUTY DESCRIPTION:

As officer in charge of the ASWEPS program aboard the Radar Picket-Barrier Ship, the incumbent is responsible for planning, organizing, executing, coordinating, and directing all phases of the total mission. His responsibilities will be in the technical, managerial, and personnel areas.

Responsibilities in Technical Areas - Incumbent will be responsible for over-all supervision and guidance in all phases of the ASWEPS technical program. He will assure adequate accomplishment of all objectives, such as equipment installation, operations (including communications), and maintenance. He will assure that all ASWEPS instruments are properly installed and that all technical manuals, as required, are available. He will supervise the preparation of schedules for data collecting operations. He will make periodic inspections to provide assurance that operations are carried out in accordance with procedures as prescribed in operational and technical guides. He will supervise processing of observational data to insure its accuracy and completeness. He will make arrangements with the Communications Officer for the transmittal of observational data to Data Processing Centers. He will assure proper level of maintenance necessary for accurate operation of instrumentation.

Responsibilities in Managerial Areas - Incumbent is responsible for over-all supervision and guidance in all phases of ASWEPS management. He will assure adequate accomplishment of management objectives contained in the following instructions:

1. Master Operational Plan of ASWEPS.
2. OPNAV Instructions and Clearances.
3. Service Test Operational Guide.
4. Quantity and Quality Control Procedures.
5. Procedures for sending or receiving instruments to or from repair and calibration centers or ordering new instruments from warehouses.
6. Procedures for operational progress reporting.

Responsibilities in Personnel Areas - Incumbent is responsible for personnel management within the framework of ASWEPS activities, i.e., recruitment, placement, training, utilization, and leave policies.

RECOMMENDED QUALIFICATIONS AND TRAINING:

Officers selected for this duty should recieve specialized instruction which includes the over-all scope of ASWEPS functions and operations, and the technical, managerial, and personnel responsibilities imposed by the ASWEPS Service Test operation. The course should include training at the supervisory level in the installation, operation, and maintenance of ASWEPS equipment. Training should include indoctrination in the various detailed instructions pertaining to ASWEPS management and personnel management requirements.

The following figures represent the number of officers who should be trained for assignment to the Radar Picket-Barrier Ships:

Operations Officer or Anti-Submarine Warfare Officers 12

*Negotiations for Radar Picket-Barrier Ships to be used as platforms in the ASWEPS Service Test have not been completed. Two classes of ships are available, AGR and DER. If the AGR is utilized, the officer in charge will be the Operations Officer; is the DER is utilized, the officer in charge will be the Anti-Submarine Warfare Officer.

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permit fully legible reproduction

DUTY TITLE: Assistant to Operations Officer

ALTERNATE DUTY TITLE:
Assistant to Anti-Submarine Warfare Officer*

PLATFORM: USN Radar Picket-Barrier Ships

RECOMMENDED RATING/RATE:
SOC or SO-1

RECOMMENDED ALTERNATE RATING/RATE:
AGC or AS-1*

DUTY DESCRIPTION:

The incumbent will assist the officer in charge of the ASWEPS program aboard the Radar Picket-Barrier Ship in planning, organizing, executing, coordinating, and directing all phases of the total mission. He will be directly responsible to the officer in charge in the technical area. He will exercise direct supervision of equipment installation of all ASWEPS instruments and obtain all technical manuals required. He will prepare schedules for data collecting operations and supervise preliminary processing of observational data to insure its accuracy and completeness. He will be responsible for seeing that completed data are compiled in proper form for forwarding to the officer in charge. He will prepare maintenance schedules and conduct periodic inspections to determine proper level of maintenance necessary for accurate operation of instrumentation.

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RECOMMENDED QUALIFICATIONS AND TRAINING:

Petty officers selected for this duty should receive specialized instruction which includes the over-all scope of ASWEPS functions and operations, and the technical responsibilities imposed by the ASWEPS Service Test operation. The course should include training in the installation, operation, and maintenance of ASWEPS equipment.

The following figures represent the number of Petty Officers who should be trained for assignment to the vessel:

USN Radar Picket-Barrier Ships 12

*Negotiations for Radar Picket-Barrier Ships to be used as platforms in the ASWEPS Service Test have not been completed. Two classes of ships are available, AGR and DER. If the AGR is utilized, personnel will be designated as Assistant to the Operations Officer; if the DER is utilized, personnel will be designated as Assistant to the Anti-Submarine Warfare Officer.

DUTY TITLE: Anti-Submarine Officer

PLATFORM: Aircraft Carriers

RECOMMENDED GRADE: LT, LTJG, or ENS

RECOMMENDED NOBC: 9206

DUTY DESCRIPTION:

The officer in charge of this phase of the ASWEPS mission aboard the Aircraft Carrier exercises limited supervision within his operating area of the over-all program. The complex mission of the Aircraft Carrier in the ASWEPS program requires a division of responsibility. Over-all supervision of ASWEPS aboard this vessel will be at a higher management level, and will be more adequately covered in a subsequent Systems Analysis. The responsibilities of the Anti-Submarine Officer will be primarily at the technical supervisory level. He will assure adequate accomplishment of all technical objectives, such as equipment installation, operations (including communications), and maintenance. He will assure that all ASWEPS instruments are properly installed and that all technical manuals, as required, are available. He will supervise the preparation of schedules for data collecting operations. He will make periodic inspections to provide assurance that operations are carried out in accordance with procedures as prescribed in operational and technical guides. He will supervise processing of observational data to Data Processing Centers. He will assure proper level of maintenance necessary for accurate operation of instrumentation.

RECOMMENDED QUALIFICATIONS AND TRAINING:

Officers selected for this duty should receive specialized instruction which includes an introduction to the principles of oceanography, the over-all scope of ASWEPS functions and operations, and the technical responsibilities imposed by the ASWEPS Service Test operation. The course should include training at the supervisory level in the installation, operation, and maintenance of ASWEPS equipment.

The following figures represent the number of officers who should be trained for assignment to Aircraft Carriers:

Anti-Submarine Officers 3

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DUTY TITLE: Assistant to Anti-Submarine Officer

PLATFORM: Aircraft Carriers

RECOMMENDED RATING/RATE:
AGC or AG-1

RECOMMENDED ALTERNATE RATING/RATE:
None

DUTY DESCRIPTION:

The incumbent will assist the officer in charge of this phase of the ASWEPS mission aboard the Aircraft Carrier within his operating area. He will be directly responsible to the officer in charge in the technical area. He will exercise direct supervision of equipment installation, operations, and maintenance. He will supervise the installation of all ASWEPS instruments and obtain all technical manuals required. He will prepare schedules for data collecting operations and supervise preliminary processing of observational data to insure its accuracy and completeness. He will be responsible for seeing that completed data are compiled in proper form for forwarding to the officer in charge. He will prepare maintenance schedules and conduct periodic inspections to determine proper level of maintenance necessary for accurate operation of instrumentation.

RECOMMENDED QUALIFICATIONS AND TRAINING:

Petty officers selected for this duty should receive specialized instruction which includes the over-all scope of ASWEPS functions and operations, and the technical responsibilities imposed by the ASWEPS Service Test operation. The course should include training in the installation, operation, and maintenance of ASWEPS equipment.

The following figures represent the number of Petty Officers who should be trained for assignment to the Aircraft Carriers:

AGC or AG-1 3

DUTY TITLE: Operations Officer (Fleet Units), Ship's Officer (MSTS)

PLATFORM: MSTS and Fleet Units

RECOMMENDED GRADE: LT, LTJG, or ENS (Fleet Units), Civilian (MSTS)

RECOMMENDED NOBC: 9274

DUTY DESCRIPTION:

As officer in charge of the ASWEPS program aboard the MSTS or Fleet Unit, the incumbent is responsible for planning, organizing, executing, coordinating, and directing all phases of the total mission. His responsibilities will be in the technical, managerial, and personnel areas.

Responsibilities in Technical Areas - Incumbent will be responsible for over-all supervision and guidance in all phases of the ASWEPS technical program. He will assure adequate accomplishment of all objectives such as, equipment installation, operations (including communications), and maintenance. He will assure that all ASWEPS instruments are properly installed and that all technical manuals, as required, are available. He will supervise the preparation of schedules for data collecting operations. He will make periodic inspections to provide assurance that operations are carried out in accordance with procedures as prescribed in operational and technical guides. He will supervise processing of observational data to insure its accuracy and completeness. He will make arrangements with the Communications Officer for the transmittal of observational data to Data Processing Centers. He will assure proper level of maintenance necessary for accurate operation of instrumentation.

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Responsibilities in Managerial Areas - Incumbent is responsible for over-all supervision and guidance in all phases of ASWEPS management. He will assure adequate accomplishment of management objectives as contained in the following instructions:

1. Master Operational Plan of ASWEPS.
2. OPNAV Instructions and Clearances.
3. Service Test Operational Guide.
4. Quantity and Quality Control Procedures.
5. Procedures for sending or receiving instruments to or from repair and calibration centers or ordering new instruments from warehouses.
6. Procedures for operational progress reporting.

Responsibilities in Personnel Areas - Incumbent is responsible for personnel management within the framework of utilization, and leave policies.

RECOMMENDED QUALIFICATIONS AND TRAINING:

Officers selected for this duty should receive specialized instruction which includes the over-all scope of ASWEPS functions and operations, and the technical, managerial, and personnel responsibilities imposed by the ASWEPS Service Test operation. The course should include training at the supervisory level in the installation, operation, and maintenance of ASWEPS equipment. Training should include indoctrination in the various detailed instructions pertaining to ASWEPS management and personnel management requirements.

The following figures represent the number of Operations Officers or Ship's Officers who should be trained for assignment to each type of vessel:

MSTS Ships (Civilians)	10
Fleet Units (Junior Officers).	24
TOTAL:	34

DUTY TITLE: Assistant to Operations Officer (Fleet Units), Assistant to Ship's Officer (MSTS)

PLATFORM: MSTS and Fleet Units

RECOMMENDED RATING/RATE:
Chief of First Class Petty Officer (Fleet Units), Civilian (MSTS)

DUTY DESCRIPTION:

The incumbent will assist the officer in charge of the ASWEPS program aboard the Fleet Unit or MSTS in planning, organizing, executing, coordinating, and directing all phases of the total mission. He will be directly responsible to the officer in charge in the technical area. He will exercise direct supervision of equipment installation, operations, and maintenance. He will supervise the installation of all ASWEPS instruments and obtain all technical manuals required. He will prepare schedules for data collecting operations and supervise preliminary processing of observational data to insure its accuracy and completeness. He will be responsible for seeing that completed data are compiled in proper form for forwarding to the officer in charge. He will prepare maintenance schedules and conduct periodic inspections to determine proper level of maintenance necessary for accurate operation of instrumentation.

RECOMMENDED QUALIFICATIONS AND TRAINING:

Petty officers selected for this duty should receive specialized instruction which includes the over-all scope of ASWEPS functions and operations, and the technical responsibilities imposed by the ASWEPS Service Test operation. The course should include training in the installation, operation, and maintenance of ASWEPS equipment.

The following figures represent the number of Petty Officers who should be trained for assignment to each type of vessels:

MSTS Ships (Civilians)	10
Fleet Units (Petty Officers)	24
TOTAL:	34

DUTY TITLE: Operations Officer

PLATFORM: Submarine

RECOMMENDED GRADE: LT, LTJG, or ENS

RECOMMENDED NOBC: 9274

DUTY DESCRIPTION:

As officer in charge of the ASWEPS program aboard the Submarine, the incumbent is responsible for planning, organizing, executing, coordinating, and directing all phases of the total mission. His responsibilities will be in the technical, managerial, and personnel areas.

Responsibilities in Technical Areas - Incumbent will be responsible for over-all supervision and guidance in all phases of the ASWEPS technical program. He will assure adequate accomplishment of all objectives such as, equipment installation, operations (including communications), and maintenance. He will assure that all ASWEPS instruments are properly installed and that all technical manuals, as required, are available. He will supervise the preparation of schedules for data collecting operations. He will make periodic inspections to provide assurance that operations are carried out in accordance with procedures as prescribed in operational and technical guides. He will supervise processing of observational data to insure its accuracy and completeness. He will make arrangements with the Communications Officer for the transmittal of observational data to Data Processing Centers. He will assure proper level of maintenance necessary for accurate operation of instrumentation

Responsibilities in Managerial Areas - Incumbent is responsible for over-all supervision and guidance in all phases of ASWEPS management. He will assure adequate accomplishment of management objectives as contained in the following instructions:

1. Master Operational Plan of ASWEPS.
2. OPNAV Instructions and Clearances.
3. Service Test Operational Guide.
4. Quantity and Quality Control Procedures.
5. Procedures for sending or receiving instruments to or from repair and calibration centers or ordering new instruments from warehouses.
6. Procedures for operational progress reporting.

Responsibilities in Personnel Areas - Incumbent is responsible for personnel management within the framework of ASWEPS activities, i.e., recruitment, placement, training, utilization, and leave policies.

RECOMMENDED QUALIFICATIONS AND TRAINING:

Officers selected for this duty should receive specialized instruction which includes the over-all scope of ASWEPS functions and operations, and the technical, managerial, and personnel responsibilities imposed by the ASWEPS Service Test Operation. The course should include training at the supervisory level in the installation, operation, and maintenance of ASWEPS equipment. Training should include indoctrination in the various detailed instructions pertaining to ASWEPS management and personnel management requirements.

The following figures represent the number of officers who should be trained for assignment to the Submarines:

Operations Officer 6

DUTY TITLE: Assistant to Operations Officer

PLATFORM: Submarine

RECOMMENDED RATING/RATE:
SOC(SS) or SO(SS)-1

RECOMMENDED ALTERNATE RATING/RATE:
QMC(SS) or QM(SS)-1

DUTY DESCRIPTION:

The incumbent will assist the officer in charge of the ASWEPS program aboard the Submarine in planning, organizing, executing, coordinating, and directing all phases of the total mission. He will be directly responsible to the officer in charge in the technical area. He will exercise direct supervision of equipment installation, operations, and maintenance. He will supervise the installation of all ASWEPS instruments and obtain all technical manuals required. He will prepare schedules for data collecting operations and supervise preliminary processing of observational data to insure its accuracy and completeness. He will will be responsible for seeing that completed data are compiled in proper form for forwarding to the officer in charge. He will prepare maintenance schedules and conduct periodic inspections to determine proper level of maintenance necessary for accurate operation of instrumentation.

RECOMMENDED QUALIFICATIONS AND TRAINING:

Petty officers selected for this duty should receive specialized instruction which includes the over-all scope of ASWEPS functions and operations, and the technical responsibilities imposed by the ASWEPS Service Test operation. The course should include training in the installation, operation, and maintenance of ASWEPS equipment.

The following figures represent the number of Petty Officers who should be trained for assignment to the Submarine:

SO(SS) or QM(SS) 6

DUTY TITLE: Patrol Plane Commander, Multiengine Land Plane

PLATFORM: Land-Based Oceanographic Reconnaissance Flights, Land-Based ASW Patrol Aircraft

RECOMMENDED GRADE: LT, LTJG, or ENS

RECOMMENDED NOBC: 8571

DUTY DESCRIPTION:

As officer in charge of the ASWEPS program aboard the aircraft, the incumbent is responsible for planning, organizing, executing, coordinating, and directing all phases of the total mission. His responsibilities will be in the technical, managerial, and personnel areas.

Responsibilities in Technical Areas -- Incumbent will be responsible for over-all supervision and guidance in all phases of the ASWEPS technical program. He will assure adequate accomplishment of all objectives, such as equipment installation, operations (including communications), and maintenance. He will assure that all ASWEPS instruments are properly installed and that all technical manuals, as required, are available. He will supervise the preparation of schedules for data collecting operations. He will make periodic inspections to provide assurance that operations are carried out in accordance with procedures as prescribed in operational and technical guides. He will supervise processing of observational data to insure its accuracy and completeness. He will determine communications requirements and provide for the transmittal of observational data to Data Processing Centers. He will assure proper level of maintenance necessary for accurate operation of instrumentation.

Responsibilities in Managerial Areas -- Incumbent is responsible for over-all supervision and guidance in all phases of ASWEPS management. He will assure adequate accomplishment of management objectives as contained in the following instructions:

1. Master Operational Plan of ASWEPS.

2. OPNAV Instructions and Clearances.
3. Service Test Operational Guide.
4. Quantity and Quality Control Procedures.
5. Procedures for sending or receiving instruments to or from repair and calibration centers or ordering new instruments from warehouses.
6. Procedures for operational progress reporting.

Responsibilities in Personnel Areas -- Incumbent is responsible for personnel management within the framework of ASWEPS activities, i.e., recruitment, placement, training, utilization, and leave policies.

RECOMMENDED QUALIFICATIONS AND TRAINING:

Officers selected for this duty should receive specialized instruction which includes the over-all scope of ASWEPS functions and operations, and the technical, managerial, and personnel responsibilities imposed by the ASWEPS Service Test operation. The course should include training at the supervisory level in the installation, operation, and maintenance of ASWEPS equipment. Training should include indoctrination in various detailed instructions pertaining to ASWEPS management and personnel management requirements.

The following figures represent the number of Patrol Plane Commanders who should be trained for assignment to each type of aircraft:

Land-Based Oceanographic Reconnaissance Flights	5
Land-Based ASW Patrol Aircraft	6
TOTAL:	11

DUTY TITLE: Assistant to Patrol Plane Commander

PLATFORM: Land-Based Oceanographic Reconnaissance Flights, Land-Based ASW Patrol Aircraft

RECOMMENDED RATING/RATE:
ATC or AT-1

DUTY DESCRIPTION:

The incumbent will assist the officer in charge of the ASWEPS program abcard the aircraft in planning, organizing, executing, coordinating, and directing all phases of the total mission. He will be directly responsible to the officer in charge in the technical area. He will exercise direct supervision of equipment installation, operations, and maintenance. He will supervise the installation of all ASWEPS instruments and obtain all technical manuals required. He will prepare schedules for data collecting operations and supervise preliminary processing of observational data to insure its accuracy and completeness. He will be responsible for seeing that completed data are compiled in proper form for forwarding to the officer in charge. He will prepare maintenance schedules and conduct periodic inspections to determine proper level of maintenance necessary for accurate operation of instrumentation.

RECOMMENDED QUALIFICATIONS AND TRAINING:

Petty officers selected for this duty should receive specialized instruction which includes the over-all scope of ASWEPS functions and operations, and the technical responsibilities imposed by the ASWEPS Service Test operation. The course should include training in the installation, operation, and maintenance of ASWEPS equipment.

The following figures represent the number of Petty Officers who should be trained for assignment to each type of aircraft.

Land-Based Oceanographic Reconnaissance Flights (ATC or AT-1)	5
Land-Based ASW Patrol Aircraft (ATC or AT-1)	6
TOTAL:	11

(7)

CONFIDENTIAL

DUTY TITLE: Anti-Submarine Pilot

PLATFORM: Carrier-Based ASW Patrol Aircraft

RECOMMENDED GRADE: LT, LTJG, or ENS

RECOMMENDED NOBC: 8515

DUTY DESCRIPTION:

The officer in charge of this phase of the ASWEPS mission aboard the Carrier-Based ASW Patrol Aircraft exercises limited supervision within his operating area of the over-all program. The complex mission of the Aircraft Carrier in the ASWEPS program requires a division of responsibility. Over-all supervision of ASWEPS aboard the Carrier will be at a higher management level, and will be more adequately covered in a subsequent Systems Analysis. The responsibilities of the Anti-Submarine Pilot will be primarily at the technical supervisory level. He will assure adequate accomplishment of all technical objectives, such as equipment installation, operations (including communications), and maintenance. He will assure that all ASWEPS instruments are properly installed and that all technical manuals, as required, are available. He will supervise the preparation of schedules for data collecting operations. He will make periodic inspections to provide assurance that operations are carried out in accordance with procedures as prescribed in operational and technical guides. He will supervise processing of observational data to insure its accuracy and completeness. He will determine communications requirements and provide for the transmittal of observational data to Data Processing Centers. He will assure proper level of maintenance necessary for accurate operation of instrumentation.

RECOMMENDED QUALIFICATIONS AND TRAINING:

Officers selected for this duty should receive specialized instruction which includes the over-all scope of ASWEPS functions and operations, and the technical responsibilities imposed by the ASWEPS Service Test operation. The course should include training at the supervisory level in the installation, operation, and maintenance of ASWEPS equipment.

The following figures represent the number of Anti-Submarine Pilots who should be trained for assignment to the aircraft:

Carrier-Based ASW Patrol Aircraft 12

DUTY TITLE: Assistant to Anti-Submarine Pilot

PLATFORM: Carrier-Based ASW Patrol Aircraft

RECOMMENDED GRADE: LTJG or ENS

RECOMMENDED NOBC: 8515

DUTY DESCRIPTION:

The incumbent will assist the officer in charge of this phase of the ASWEPS mission aboard the aircraft within his operating area. He will be directly responsible to the officer in charge in the technical area. He will exercise direct supervision of equipment installation, operations, and maintenance. He will supervise the installation of all ASWEPS instruments and obtain all technical manuals required. He will prepare schedules for data collecting operations and supervise preliminary processing of observational data to insure its accuracy and completeness. He will be responsible for seeing that completed data are compiled in proper form for forwarding to the officer in charge. He will prepare maintenance schedules and conduct periodic inspections to determine proper level of maintenance necessary for accurate operation of instrumentation.

RECOMMENDED QUALIFICATIONS AND TRAINING:

Officers selected for this duty should receive specialized instruction which includes the over-all scope of ASWEPS functions and operations, and the technical responsibilities imposed by the ASWEPS Service Test operation. The course should include training in the installation, operation, and maintenance of ASWEPS equipment.

A Junior Officer is recommended as the assistant on Carrier Based ASW Patrol Aircraft because the aircraft employed, the S2F, carries a crew of only two officers and two enlisted crew members. Since both enlisted crew members will be trained as equipment operators, the second pilot officer is designated as assistant. Both officers will receive the same training and will participate in ASWEP duties.

The following figures represent the number of officers who should be trained for assignment to the Aircraft:

Carrier-Based ASW Patrol Aircraft 12

CONFIDENTIAL

DUTY TITLE: Helicopter Anti-Submarine Pilot

PLATFORM: Carrier-Based ASW Helicopters

RECOMMENDED GRADE: LT, LTJG, or ENS

RECOMMENDED NOBC: 8539

DUTY DESCRIPTION:

The officer in charge of this phase of the ASWEPS mission aboard the Carrier-Based ASW Helicopter exercises limited supervision within his operating area of the over-all program. The complex mission of the Aircraft Carrier in the ASWEPS Program requires a division of responsibility. Over-all supervision of ASWEPS aboard the Carrier will be at a higher management level, and will be more adequately covered in a subsequent Systems Analysis. The responsibilities of the Helicopter Anti-Submarine Pilot will be primarily at the technical supervisory level. He will assure adequate accomplishment of all technical objectives, such as equipment installation, operations (including communications), and maintenance. He will assure that all ASWEPS equipment is properly installed and that all technical manuals, as required, are available. He will supervise the preparation of schedules for data collecting operations. He will make periodic inspections to provide assurance that operations are carried out in accordance with procedures as prescribed in operational and technical guides. He will supervise processing of observational data to insure its accuracy and completeness. He will determine communications requirements and provide for the transmittal of observational data to Data Processing Centers. He will assure proper level of maintenance necessary for accurate operation of instrumentation.

RECOMMENDED QUALIFICATIONS AND TRAINING:

No specialized training is recommended for Helicopter Anti-Submarine Pilots. The Helicopter will carry only one ASWEPS instrument, the Helicopter Bathythermograph. Due to the simplicity of its operation, it is recommended in this Systems Analysis that only a cadre of operators be given training in this instrument. They, in turn, will conduct On-the-Job Training for other operators and Pilots in their respective squadrons.

No assistant is recommended for this aircraft, since the ASWEPS operations are relatively small and simple.

The following figures represent the number of Helicopter Anti-Submarine Pilots who will be involved in the Service Test operation:

Helicopter Anti-Submarine Pilots 18

DUTY TITLE: Electronics Maintenance Officer (Coast Guard)

PLATFORM: Oceanographic Buoys (Maintained by Coast Guard Patrol Craft)

RECOMMENDED GRADE: LT, LTJG, or ENS

RECOMMENDED NOBC: 5530

DUTY DESCRIPTION:

As officer in charge of the ASWEPS maintenance program aboard the Coast Guard Patrol Craft, the incumbent is responsible for planning, organizing, executing, coordinating, and directing all phases of the total mission. His responsibilities will be in the technical, managerial, and personnel areas.

Responsibilities in Technical Areas -- Incumbent will be responsible for over-all supervision and guidance in all phases of the ASWEPS technical program. He will assure adequate accomplishment of such objectives as equipment installation and maintenance. He will assure that all ASWEPS instruments are properly installed on the oceanographic buoys and that all technical manuals, as required, are available. He will assure proper level of maintenance necessary for accurate operation of instrumentation.

Responsibilities in Managerial Areas -- Incumbent is responsible for over-all supervision and guidance in all phases of ASWEPS management. He will assure adequate accomplishment of management objectives as contained in the following instructions:

1. Master Operational Plan of ASWEPS.
2. OPNAV Instructions and Clearances.

3. Service Test Operational Guide.
4. Quantity and Quality Control Procedures.
5. Procedures for sending or receiving instruments to or from repair and calibration centers or ordering new instruments from warehouse.
6. Procedures for operational progress reporting.

Responsibilities in Personnel Areas -- Incumbent is responsible for personnel management within the framework of ASWEPS activities, i.e., recruitment, placement, training, utilization, and leave policies.

RECOMMENDED QUALIFICATIONS AND TRAINING:

Officers selected for this duty should receive specialized instruction which includes the over-all scope of ASWEPS functions and operations, and the technical, managerial, and personnel responsibilities imposed by the ASWEPS Service Test operation. The course should include training at the supervisory level in the installation and maintenance of ASWEPS equipment. Training should include indoctrination in the various detailed instructions pertaining to ASWEPS management and personnel management requirements.

The following figures represent the number of Officers who should be trained for assignment to Coast Guard Patrol Craft:

USCG Electronics Maintenance Officers 12

DUTY TITLE: Assistant to Electronics Maintenance Officer (Coast Guard)

PLATFORM: Oceanographic Buoys (Maintained by Coast Guard Patrol Craft)

RECOMMENDED RATING/RATE:
ETC or ET-1

DUTY DESCRIPTION:

The incumbent will assist the officer in charge of this phase of ASWEPS mission aboard the Coast Guard Patrol Craft within his operating area. He will be directly responsible to the officer in charge in the technical area. He will supervise the installation of all ASWEPS instruments and obtain all technical manuals required. He will prepare maintenance schedules and conduct periodic inspections to determine proper level of maintenance necessary for accurate operation of instrumentation.

RECOMMENDED QUALIFICATIONS AND TRAINING:

Petty officers selected for this duty should receive specialized instruction which includes the over-all scope of ASWEPS functions, and the technical responsibilities imposed by the ASWEPS Service Test operation. The course should include training in the installation, maintenance, and repair of ASWEPS equipment.

The following figures represent the number of Petty Officers who should be trained for assignment to Coast Guard Patrol Craft:

ETC or ET-1 (CG) 12

THE FOLLOWING INSTRUMENT
AND DUTY DESCRIPTIONS ARE
FOR THE OPERATIONAL AND
MAINTENANCE PERSONNEL OF
SUBSYSTEMS ONE AND TWO
OF ASWEPS.

CONFIDENTIAL

DUTY TITLE: Bathythermograph Operator

PLATFORMS: USCG Ocean Station Vessels, USN Radar Picket-Barrier Ships, MSTS and Fleet Units, Carriers and Destroyers

RECOMMENDED RATING/RATE:
SO(G)-2 or SO(G)-3

ALTERNATE RECOMMENDED RATING/RATE:
AG-2 or AG-3

RECOMMENDED NEC: None

INSTRUMENT DESCRIPTION:

The mechanical Bathythermograph (BT) is shaped roughly like a torpedo, is approximately thirty inches long and two inches in diameter, and is made of metal. It weighs approximately thirty-five pounds. It is an instrument designed to accomplish two things: To measure ocean temperature as a function of depth and to make a permanent graphical record of this measurement. Inside the BT is a stylus and glass slide. As the instrument is lowered and raised in the ocean, the stylus inscribes a scratch on the glass slide. When compared with a grid precalibrated to match the individual BT which has been used, the inscription will show the temperature/depth measurement. The BT is lowered to a prescribed depth, usually 400 feet or 900 feet, depending on the design of the instrument and the measurement desired. It is lowered into the ocean from the ship deck by means of a winch.

DUTY DESCRIPTION:

1. Installation -

Bathythermographs may be stored in racks in designated areas of the ship. If frequent observations are to be taken, some of them may be stored in deck racks near the winch for easy access. It must be noted that wherever stored, the BT must always be kept out of the sun and away from the vicinity of fire rooms, steam pipes, or other sources of heat, since

an instrument that has been overheated may have the stylus arm jammed in the high-temperature position. Before taking the observation the operator should provide the supply of glass slides convenient to the place of observation, to be installed in the instrument. He should also check the winch to be sure that it is operating. The operator examines the wire reel and wire on the winch and connects the BT. The type of cable hitch used to connect the BT to the wire differs slightly with different models. The instruction book accompanying each BT shows the method of attachment for the model.

2. Operation -

After attaching the BT to the winch cable, the sequence of operations for taking an observation is as follows: Install a glass slide inside the instrument; put the BT over the side of the ship and lower it to such a depth that it rides smoothly, just below the water surface, where it is held for about thirty seconds; while the BT is being towed at the surface, take a bucket temperature of the surface water and record it on oceanographic log sheet B; lower the BT to the desired depth; raise the BT again and bring it back on board; remove the slide and secure the equipment. If more observations are to be made soon, the BT may be stored in a deck rack connected to the wire; otherwise, unshackle the instrument and return it to proper storage area.

The glass slide with stylus trace must now be properly labeled. This is done by marking on the slide with a sharp pencil the following information: consecutive slide number, the minute at which the BT entered the water; the exact date and the BT instrument number. The BT instrument number will indicate which grid should be used to read the slide.

The glass slide should now be read using the proper grid as indicated by the BT instrument number. The grid is compared with the slide in a special viewer and the temperature/depth measurement marked down for later insertion in oceanographic log sheet B. The slide is stored in its box for later forwarding. The oceanographic log sheet B is filled out per instructions showing such information as ship's name, time, position, etc. As required, the data obtained may be placed on a special radio log sheet to be encoded and transmitted by radio message to the Naval Communications Center for further transmission to the Environmental Data Processing Unit. The slides will be stored and later forwarded to the Hydrographic Office for interpretation and evaluation.

3. Maintenance -

After each period of use the BT should be rinsed with fresh water. The interior of the BT should be rinsed with rust preventive compound each week. The BT should not be oiled. It is recommended that the BT not be disassembled, inasmuch as it is difficult to avoid damage to its mechanism when so doing. If the instrument does not function properly, it is recommended that another be substituted and the defective instrument turned in for repair in accordance with established procedures.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that a specialized course of training be given to qualified personnel to further qualify them in the operation and maintenance of the instrument as well as in its ASWEPS application.

For the purpose of clarification it should be stated at this point that a total of 236 operating and maintenance personnel will require training for Subsystem One and Two of ASWEPS. The figures presented below show the number out of the total 236 who will require training in the BT. The same principle will hold true for the remaining instruments discussed in this section (Part II).

The figures listed below represent the number of men by rate and by platform recommended for training in the operation of the subject instrument:

For USN Radar Picket-Barrier Ships,

SO(G)-2 & SO(G)-3	24

For MSTS and Fleet Units,

Civilians	20
SO(G)-2 & SO(G)-3	48

For Carriers,

AG-2 & AG-3	6

For Destroyers,

SO(G)-2 & SO(G)-3	48

For USCG Ocean Station Vessels,

(SO(G)-2 & SO(G)-3	42
TOTAL:	188

DUTY TITLE: Shipboard Electronic Bathythermograph Operator

PLATFORMS: USCG Ocean Station Vessels and USN Radar Picket-Barrier Ships

RECOMMENDED RATING/RATE:
SO(G)-2 or SO(G)-3

ALTERNATE RECOMMENDED RATING/RATE:
None

INSTRUMENT DESCRIPTION:

The Electronic Bathythermograph (EBT) is an instrument designed to measure ocean temperature as a function of depth and to make a permanent graphical record of this measurement. The EBT consists of three basic units: A sensing instrument which is lowered into the ocean from a deck winch, a conversion unit, and an X-Y Recorder on which the measurement is displayed. As the sensing instrument is lowered and raised in the water it sends back a signal through a towing cable with a conducting core, this signal is converted to a voltage driving an X-Y Recorder which in turn makes a trace on graph paper representing the temperature/depth function. It should be noted that the EBT is still in the prototype stage. Thus far it has functioned successfully only when the ship is stationary or moving at speeds not exceeding six knots. Its future adaptation for all types of fleet units is indefinite. In the present prototype stage the instrument readout has been presented on an X-Y Recorder, but in future development the information obtained may be automatically telemetered or presented on digitized tape.

DUTY DESCRIPTION:

1. Installation -

The deck winch, the conversion unit, and the X-Y Recorder will be dock installed by technicians. The installation duties for this instrument will consist only of taking the EBT sensing unit from storage and attaching it to the cable and deck winch. The winch must be checked for proper operation, all electrical connections checked, and the EBT and Recorder put through a test run to determine if they are operating properly. No special handling or storage problems have yet been determined for this instrument except that reasonable care should be exercised as in the handling of any sort of electronic gear. Prior to the taking of an observation, the paper supply must be checked in the Recorder and a new supply installed as necessary. Ink supply for the pens in the Recorder must be periodically checked and refilled.

2. Operation -

In making an observation with the EBT, it is anticipated that the following sequence of operations will take place: Attach EBT to cable of deck winch; make electrical connections if not previously done; turn on power; X-Y Recorder is mechanically zeroed and switched to calibrate; the desired temperature range is selected from calibration on the Recorder; the winch operator is signalled to lower the sensing element into the water; as soon as the desired depth is reached, the operator immediately raises the EBT to the surface and brings it aboard. After the instrument is lowered to the proper depth and before being raised again, it may be advantageous to change ink pen colors on the Recorder in order to provide a contrast between the descending and ascending trace. As the instrument is lowered and raised in the water, the recorder makes an ink trace on graph paper showing the temperature/depth measurement.

After the observation is completed and equipment secured, the operator removes the sheet of graph paper from the recorder and reads the temperature/depth measurement. This information is entered in appropriate logs after which it may be further transferred to a radio log sheet, encoded and transmitted by radio to the Environmental Data Processing Unit via Naval Communication Center. The sheet of graph paper containing the measurement is stored and later forwarded to the Hydrographic Office for evaluation and filing. The graph paper should be makred with name of ship, time, date, and place of observation. This information will also be entered in the log sheet.

3. Maintenance -

The EBT is in the prototype stage at this writing and thus many maintenance functions have not yet been determined. It is anticipated that it will be necessary to occasionally change transducers in the sensing unit by means of a replacement cartridge. No lubrication or cleaning operations are anticipated at this time. It is further anticipated that a prime source of malfunction may be the X-Y Recorder and that its repair may be beyond operator or shipboard capabilities. Operator maintenance will consist primarily of trouble-shooting and localizing so as to determine which major assembly is malfunctioning. When the malfunctioning assembly is discovered it may be removed and a spare substituted. The defective assembly will then be returned to an instrument repair center in accordance with standard procedures.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that a specialized course of training be given to qualified personnel to further qualify them in the operation and maintenance of the instrument as well as in its ASWEPS application.

The figures presented below represent the number of men by rate and by platform recommended for training in the operation of the subject instrument:

For USN Radar Picket-Barrier Ships,

SO(G)-2 & SO(G)-3	24

For USCG Ocean Station Vessels,

SO-2 & SO-3	42
TOTAL:	66

DUTY TITLE: Sound Velocity Meter Operator

PLATFORMS: USCG Ocean Station Vessels and USN Radar Picket-Barrier Ships

RECOMMENDED RATING/RATE:
SO(G)-2 or SO(G)-3

ALTERNATE RECOMMENDED RATING/RATE:
None

RECOMMENDED NEC: None

INSTRUMENT DESCRIPTION:

The Sound Velocity Meter is an instrument designed to measure sound velocity in the ocean and to provide a permanent graphical record of this measurement. The instrument will consist of three major assemblies: A sensing device known as the velocimeter which is lowered and raised in the ocean by means of a deck winch; an electronic conversion unit; and an X-Y Recorder on which the data is presented as a trace on graph paper. If a digitized tape read-out is desired, a flexowriter will be added to the three assemblies already described.

DUTY DESCRIPTION:

1. Installation -

Remove the velocimeter from storage and attach it to the deck winch. Attach electrical connections and check them. Check paper supply in the X-Y Recorder and replenish if necessary. Check the supply of tape in the flexowriter if one is used. The deck-winch, the console, the recorder and the flexowriter will have been installed in the ship by technicians prior to embarkation, and will be a semi-permanent installation.

2. Operation -

At the time of this writing the Sound Velocity Meter is being manufactured. Until production items and manufacturer's instructions are available, the exact sequence of operation cannot be prescribed. It is anticipated that the following described procedures will apply when taking an observation with this instrument, but these procedures will be subject to change when more exact information becomes available.

After turning on power, set up velocity and depth scales on the X-Y Recorder. Turn on the Recorder and the flexowriter and notify the winch operator to lower the velocimeter to the designated depth. As the velocimeter is lowered and raised in the ocean, the data is automatically registered on the Recorder and/or flexowriter, if one is used.

If the Recorder is used alone, the data obtained from its trace must be transferred to appropriate log sheets, encoded and transmitted by radio to the appropriate Data Processing Center. If digitized tape is employed, the data will automatically telemetered.

3. Maintenance -

Unitl this equipment is more completely developed, it is impossible to determine routine or preventive maintenance requirements.

It is anticipated that maintenance operations will include, checking of electrical connections, replacement of tubes, replacement of batteries, and trouble-shooting and localizing of malfunctions.

The operator should be capable of removing a defective assembly and substituting a spare. It is anticipated that anything other than first echelon checking and repair of major assemblies will be impossible on shipboard and thus a defective unit will have to be removed and replaced by an operable unit. The defective assembly will then be forwarded to an instrument repair center in accordance with established procedures.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that a specialized course of training, be given to qualified personnel to further qualify them in the operation and maintenance of the instrument as well as in its ASWEPS application.

The figures presented below represent the number of men by rate and by platform recommended for training in the operation of the subject instrument:

For USN Radar Picket-Barrier Ships,

SO(G)-2 or SO(G)-3 24

For USCG Ocean Station Vessels,

SO-2 or SO-3 42

TOTAL: 68

DUTY TITLE: High Speed Towed Housing Operator

PLATFORMS: Destroyers

RECOMMENDED RATING/RATE:
SO(G)-2 or SO(G)-3

ALTERNATE RECOMMENDED RATING/RATE:
None

RECOMMENDED NEC: None

INSTRUMENT DESCRIPTION:

The High Speed Towed Housing (HSTH) is an instrument designed to measure ocean temperature as a function of depth and to make a permanent record of this measurement. This instrument operates on the same principle and in the same way as the Electronic Shipboard Bathythermograph previously described. It differs from the EBT in that the sensor assembly is enclosed in a metal casing which is designed so that it may be towed from the ship at relatively high speeds and thus eliminate the necessity of lowering the instrument into the water and recovering it in order to take an observation. The HSTH is in the prototype stage as of this date.

The HSTH is composed of three major assemblies: A housed sensor assembly which is towed from a deck winch; an electronic converter; and an X-Y Recorder. To these three major assemblies may be added a flexowriter which will yield a read-out in digitized tape.

DUTY DESCRIPTION:

1. Installation -

Prior to taking an observation, all three assemblies must be interconnected by electric circuits, the sensor assembly is lowered into the water in towing position, a supply of graph paper is installed in the recorder, and a reel of paper tape installed in the flexowriter. The instrument is now ready to record observations.

2. Operation -

This instrument is still in the prototype stage and the exact sequence of operation has not yet been determined but it is anticipated that it will be similar to that of the EBT. The following sequence of operations will be the general pattern to be followed in the taking of observations: Turn on power; zero recorder and select proper operating range; signal winch operator to lower the sensor assembly to the desired depth. Raise it again to towing position and as the sensor assembly is lowered and raised in the water the observations will be automatically registered on the recorder and/or punched on paper tape by the flexowriter.

If the X-Y Recorder is used alone to provide the readout the temperature/depth measurement along with other appropriate identifying data such as name of vessel, time, date, and position should be recorded on a log sheet provided for this purpose. This data may then be transferred to a radio log sheet to be encoded and transmitted by radio.

3. Maintenance -

Routine maintenance functions to be carried out on the HSTH will include periodic changing of thermistors in the sensor assembly, replacement of batteries, and replacement of tubes and fuses. A malfunction of the thermistors in the sensor assembly may be easily detected by the trace on the X-Y Recorder. Paper and ink supplies must be replenished in the recorder and new spools of paper tape installed in the flexowriter when they are expended.

The operator must trouble-shoot and localize malfunctions in the equipment, removing defective assemblies and replacing them with spares. It is anticipated that repair of major assemblies, other than checking wiring and replacement of components, will be beyond shipboard capabilities. The defective assembly will be forwarded to an instrument repair center in accordance with established procedures.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that a specialized course of training be given to qualified personnel to further qualify them in the operation and maintenance of the instrument as well as in its ASWEPS application.

The figures presented below represent the number of men recommended for training in the operation of the subject instrument:

For Destroyers,

SO(G)-2 or SO(G)-3 48

DUTY TITLE: Surface Thermograph Operator

PLATFORMS: USCG Ocean Station Vessels, USN Radar Picket-Barrier Ships, MSTS and Fleet Units, Carriers, and Destroyers

RECOMMENDED RATING/RATE:
SO(G)-2 or SO(G)-3

ALTERNATE RECOMMENDED RATING/RATE:
AG-2 or AG-3

RECOMMENDED NEC: None

INSTRUMENT DESCRIPTION:

The Surface Thermograph is an instrument designed to measure the surface temperature of the ocean and to make a permanent graphical record of this measurement. It is composed of a hull-mounted sensing unit and a recorder. The surface temperature of the ocean is presented as an ink trace on moving graph paper. The paper is so calibrated that temperature may be read directly without further calculation.

DUTY DESCRIPTION:

1. Installation -

This equipment will be installed on the ship in the dock by technicians. The instrument operator will be required to install additional supplies of paper and ink in the recorder when they are expended.

2. Operation -

The Operator will be required to activate the sensing elements, turn on and monitor the recorder. If the sensing element is retractable, the operator will be required to manipulate a remote control lever or switch which will palce the sensing unit in operating position. The operator will then be required to turn on the recorder and to annotate the graph paper in the recorder to show, date, time, and location of observation. The reading obtained may be further transferred to appropriate log sheets. The data thus collected will be transmitted to the Environmental Data Processing Unit via radio message and/or by forwarding of the collected and annotated strip charts.

3. Maintenance -

Maintenance of this instrument will be limited to occasional lubrication of the retraction mechanism of the sensing element, changing paper and ink supplies in the recorder and trouble-shooting. In the event that the recorder malfunctions, it will be necessary to replace the unit and to forward it to an instrument repair center in accordance with established procedures. Checking electric connections will be a part of the maintenance function. No calibration procedures are necessary.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that a specialized course of training be given to qualified personnel to further qualify them in the operation and maintenance of the instrument as well as in its ASWEPS application.

The figures presented below represent the number of men by rate and by platform recommended for training in the operation of the subject instrument:

For USN Radar Picket-Barrier Ships,

SO(G)-2 or SO(G)-3	24

For MSTS and Fleet Units,

Civilians	20
SO(G)-2 or SO(G)-3	48

For Carriers,

AG-2 or AG-3	6

For Destroyers,

SO(G)-2 or SO(G)-3	48

For USCG Ocean Station Vessels,

SO-2 or SO-3	42
TOTAL:	188

DUTY TITLE: Radiation Equipment Operator (Recording Radiometer)

PLATFORMS: USN Radar Picket-Barrier Ships, USCG Ocean Station Vessels, Aircraft Carriers, Research Tower

RECOMMENDED RATING/RATE:
AG-2 or AG-3

ALTERNATE RECOMMENDED RATING/RATE:
Civilian (Research Tower)

INSTRUMENT DESCRIPTION:

Radiation Equipment is designed to measure and record radiant energy. For purposes of the ASWEPS Service Test it is intended primarily for use in the ocean environment. In its present prototype stage of development the equipment consists of three major assemblies: A sensor assembly consisting of two pyrheliometers and two flatplate radiometers, a voltage divider, and a multi-channel strip-chart recorder. Within the sensor assembly, the sensing instruments are so arranged that one pyrheliometer and one radiometer are in an upright position and the other pyrheliometer and radiometer are in an inverted position. The assembly is connected in such a way that the pyrheliometers feed into the voltage divider and thence into the recorder. The radiometers, the pyrheliometers and the radiometers will be considered separately at this point, although their combined readings will later be considered as one unified parameter. Each pyrheliometer has a calibration factor which is listed by the manufacturer. When this constant is set on the voltage divider, the recorder will yield a two-channel reading (one for each pyrheliometer) directly in solar radiation units. The radiometers will each yield

2. Operation -

Turn on power. Dial feed pyrheliometer calibration factors (as listed by the manufacturer) into the voltage divider. Turn on the recorder, and the instrument should now register radiation measurements. A total of six channels will be recorded, two represent millivolt readings from the radiometers, and two represent temperature readings from the radiometers. (The operator will know which instrument is registering on which channel from the order in which the instruments were connected to the recorder.)

The readings obtained must now be tabulated to show total incoming and outgoing radiation and/or net radiation for the period of observation. This will be stated in solar radiation units, (gram calories per square centimeter, per minute). The pyrheliometer readings are expressed in solar radiation units on the strip chart. The readings from the radiometers, however, must be converted to solar radiation units by means of a data reduction process. In order to accomplish this, the operator sums and averages the data by time period (including pyrheliometer readings). To the averaged radiometer readings (MV & TEMP) a formula is applied which will yield a result in solar radiation units. The readings from the pyrheliometer show "incoming" or short-wave radiation. The converted radiometer readings show "total" or long-wave radiation. By substracting the average long-wave radiation from the average short-wave radiation, the net radiation will be obtained. The data thus obtained may now be entered into log sheets and transmitted to appropriate Data Processing Centers.

3. Maintenance -

Maintenance operations will include: Changing chart paper and ink supply in the recorder; checking for broken lines, corrosion, frayed wiring; and washing foreign matter accumulation from the sensors with fresh water. This last operation should be performed at least once per day and should be done after sunset. Spare components for the sensor assembly, particularly the pyrheliometer bulbs, should be carried and re-installed periodically. First echelon repairs should be made on the voltage divider and the recorder. It is anticipated that in the event that either of these two instruments malfunction they will have to be removed, forwarded to an instrument repair center, and a new unit installed to replace the defective one. Repair of the voltage divider or recorder will probably be beyond the capability of shipboard facilities. The operator will troubleshoot the system, localize malfunctions, and change major assemblies as required. The voltage divider and recorder will be pre-calibrated by the manufacturer or by a laboratory facility before being installed, but it would be useful for the operator to be familiar with procedures for checking the calibration of these instruments using the standard potentiometer.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that a course of specialized training be given to qualified personnel to further qualify them in the operation and maintenance of the instrument as well as in its ASWEPS application. A course of On-the-Job training to be given at and by the Hydrographic Office is recommended for civilian personnel selected to man the Research Tower.

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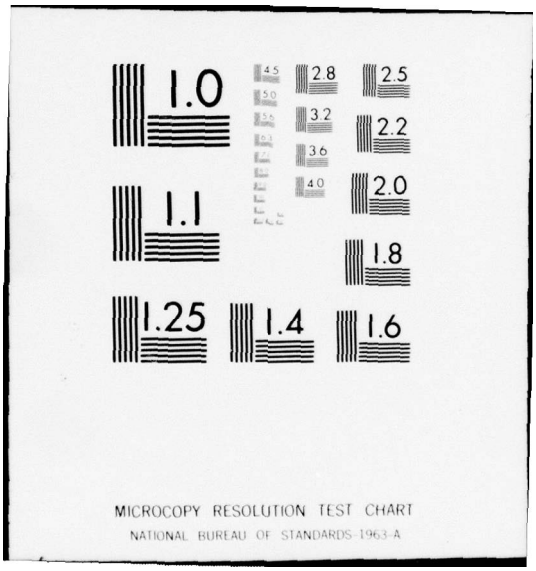
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MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

The figures presented below represent the number of men by rate and platform recommended for training in the operation of the subject equipment:

For USN Radar Picket-Barrier Ships,

AG-2 or AG-3	24

For Carriers,

AG-2 or AG-3	6

For USCG Ocean Station Vessels,

SO-2 or SO-3	42

For the Research Tower,

Civilians*	8
TOTAL:	84

2. Selection Criteria -

Civilian Personnel selected to operate this instrument should posses a background in mathematics and electronics.

*Will be replaced by military personnel during wartime situation.

a reading of two channels (total of four channels) in which one channel will read in millivolts and the other in temperature. When operating, the recorder will display six channels, two pyrheliometers channels showing solar radiation units, one channel from each radiometer showing millivolts, and one channel from each radiometer showing temperature. The readings from the radiometers must then be converted to solar radiation units by a data reduction process.

During a test of the prototype equipment conducted by the Hydrographic Office, the sensor assembly was affixed to a pole approximately fifteen feet in length and the pole in turn was rigged to the bow of a ship. Components of the instrument were mounted in this way so that the effects of the elements of the ship would be minimized in the radiation measurement.

DUTY DESCRIPTION:

1. Installation -

Assemble, mount, and position two pyrheliometers and two flatplate radiometers. Position the pyrheliometers and radiometers in such a manner that one of each is in an upright position and one of each is in an inverted position. The sensor assembly is attached to a pole, boom, or other suitable device and rigged in such a way that it will extend forward of the bow of the ship approximately fifteen feet. Electrical connections are hooked-up in proper sequence between the sensor assembly, the voltage divider, and the recorder. A supply of paper and ink are installed in the recorder, and the instrument is plugged into the ship's power supply.

DUTY TITLE: Fathometer Operator

PLATFORMS: Destroyers

RECOMMENDED RATING/RATE:
SO(G)-2 or SO(G)-3

ALTERNATE RECOMMENDED RATING/RATE:
None

RECOMMENDED NEC: None

INSTRUMENT DESCRIPTION:

The Fathometer is an instrument designed to measure water depth by sonic means and to visually indicate or permanently record such water depths. The instrument consists of a hull-mounted sonar-transducer and a display unit. The display unit contains a cathode ray tube and a strip chart recorder. Depth information is presented either on the cathode ray tube or on the recorder as a trace on calibrated strip chart paper. Depths of four to one hundred fathoms may be indicated on the cathode ray tube. Depths of eighteen feet to 6,000 fathoms may be recorded on the strip chart paper. Under normal operating conditions the instrument sends out signals automatically, but may be set for "single ping" if circumstances warrant.

DUTY DESCRIPTION:

1. Installation -

Installation of the Fathometer, particularly the sonar-transducer must be accomplished while the ship is in dock by contract technicians.

Prior to operation the supply of strip chart paper and ink in the recorder should be installed. The instrument will be pre-calibrated by the manufacturer.

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2. Operation -

The sequence of operation for taking observations with the Fathometer is as follows: Turn Power switch to Standby; after thirty seconds warm-up period, throw POWER switch to "ON"; select depth range and "INDICATOR" or "RECORDER" operation on RANGE switch; select "AUTOMATIC" (periodic) or "SINGLE PING" on PING switch; adjust GAIN control for suitable echo marking; leave POWER switch in "STANDBY" if set is to be maintained in readiness but not in operation; turn POWER switch to "OFF" (center position) when operations are terminated and the equipment is not expected to be operated.

When the Fathometer is in operation the plot of the strip chart becomes a representation of the contour of the bottom of the ocean. If the time at any reference point is known, the time of any reading on the chart can be determined. The relations of depth ranges, stylus speeds, pulse rates, pulse lengths, and paper speeds are shown in a table provided in the manufacturer's instruction book.

The observed data should be given to the bridge for ship's use and should also be transmitted via radio to the appropriate Data Processing Center.

3. Maintenance -

The operator should make minor adjustments, replace lamps, tubes, stylii, or paper, and should be satisfied that the gear will render continuous performance during the anticipated operating interval. A pre-operation check should be conducted to see if the equipment is operational, using procedures as outlined in the instruction book. This check should be performed once daily on days when the instrument is used. Quarterly and annually the recorder mechanism should be lubricated. At the conclusion of 500 hours of operation all tubes should be removed from the set and tested.

1-2

The instrument operator will also be required to localize malfunctions and to trouble-shoot the equipment. A trouble-shooting chart is provided in the manufacturer's instruction book. Repairs to the electrical components of this equipment are not practical. Adjustable components of this equipment are unlikely to go out of adjustment in routine operation, but since they may be damaged and need replacement the manner in which circuit adjustments are made is given in the instruction book. Required test equipment consists of the electronic multimeter, the oscilloscope, the signal generator and the tube testor.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that a specialized course of training be given to qualified personnel to further qualify them in the operation and maintenance of the instrument as well as in its ASWEPS application.

The figures presented below represent the number of men recommended for training in the operation of the subject instrument:

For Destroyers,

SO(G)-2 or SO(G)-3 48

DUTY TITLE: Topside Echosounder Operator

PLATFORMS: Submarines

RECOMMENDED RATING/RATE:
QM(SS)-2 or QM(SS)-3

ALTERNATE RECOMMENDED RATING/RATE:
None

RECOMMENDED NEC: None

INSTRUMENT DESCRIPTION:

The Topside Echosounder is an instrument designed to measure by sonic means the submerged depth of a submarine from the ocean surface and to visually indicate or permanently record this data. Depth information is presented as a trace on a cathode ray tube and as a stylus trace on calibrated graph paper in a recorder. Depths of four feet to one hundred fathoms may be indicated on the cathode ray tube. Depths of eighteen feet to 6,000 fathoms may be registered on the recorder. The instrument consists of a hull-mounted sensing head and a display panel which contains operating controls and display equipment.

DUTY DESCRIPTION:

1. Installation -

The equipment is dock-installed by contract technicians.

2. Operation -

Prior to operation a supply of strip chart paper and ink must be installed in the recorder and should be checked and replenished as necessary. The instrument will be pre-calibrated by the manufacturer.

The sequence of operation for taking readings with this instrument is as follows: Turn power switch to STANDBY; after thirty seconds warm-up period, throw POWER switch to "ON"; select depth range and "INDICATOR" or "RECORDER" operation on RANGE switch; select "AUTOMATIC" (periodic) or "SINGLE PING" on PING switch; adjust GAIN control for suitable echo marking; leave POWER switch in "STANDBY" if set is to be maintained in readiness but not in operation. Turn POWER switch to "OFF" (center position) when operations are terminated and the equipment is not expected to be operated.

When the submarine preceeds at a constant speed, following a straight course, and the Topside Echosounder is in operation the plot of the strip chart becomes representation of the surface of the ocean. If the time at any reference point is known, the time of any reading on the chart can be determined. The relations of depth ranges, stylus speeds, pulse rates, pulse lengths, and paper speeds are shown in a table provided in the manufacturer's instruction book.

The observed data should be given to the submarine's combat room for ship's use as necessary. The data should also be transmitted via radio to the appropriate Data Processing Center.

3. Maintenance -

The operator will make minor adjustments, replace lamps, tubes stylii or paper, and should be satisfied that the gear will render continuous performance during the anticipated operating interval. A pre-operation check should be conducted to see if the equipment is operational, using procedures as outlined in the instruction book. This check should be performed once daily on days on which the instrument is used. Quarterly and annually the recorder mechanism should be lubricated. At the conclusion of 500 hours of operation all tubes should be removed from the set and tested.

The instrument operator will also be required to localize malfunctions and to trouble-shoot the equipment. A trouble-shooting chart is provided in the manufacturer's instruction book. Repairs to the electrical components of this equipment are not practical. Adjustable components of this equipment are unlikely to go out of adjustment in routine operation but since they may be damaged and need replacement, the manner in which circuit adjustments should be made is given in the instruction book. Required test equipment consists of the electronic multimeter, the oscilloscope, the signal generator and the tube tester.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that qualified personnel be given a course of instruction to further qualify them in the operation and maintenance of the subject equipment.

The figures listed below represent the recommended number of personnel to be selected and trained for the maintenance of the subject platform and equipment:

QM(SS)-2 or QM(SS)-3 12

DUTY TITLE: Electronic Expendable Bathythermograph Operator

PLATFORMS: Land-Based Reconnaisance Aircraft, Carrier-Based ASW Aircraft and Land-Based ASW Patrol Aircraft

RECOMMENDED RATING/RATE:
AT-2 or AT-3

ALTERNATE RECOMMENDED RATING/RATE:
None

RECOMMENDED NEC: None

INSTRUMENT DESCRIPTION:

The Electronic Expendable Bathythermograph (EEBT) is an instrument designed to measure ocean temperature as a function of depth and to provide a permanent graphical record of this measurement. It is operated from an aircraft and consists of four major assemblies: The sensing unit, a radio receiver, a data converter, and a recorder. In order to make an observation with this instrument the sensing unit is launched from the aircraft into the water. Upon reaching the ocean surface it looses a sensing element which measures temperature/depth and sends this data as a radio signal from an internal transmitter. The signal is picked up on the aircraft radio receiver, converted to electric voltage which drives a recorder, which presents the measurements thus obtained as an ink trace on graph paper. The sensing unit is expendable.

DUTY DESCRIPTION:

1. Installation -

Prior to mission the EEBT (sensing unit) should be installed in the aircraft sonobuoy chutes. This will be done by Ordnancemen rather than by the operator. The operator checks the adequacy of the paper and ink supply in the recorder. The operator also checks receiver, converter, and recorder to determine if they are functioning properly.

2. Operation -

After the aircraft is airborne the equipment is turned on for a warm-up period. The sequence of operations to be followed by the operator of this instrument is as follows: Place the converter in CALIBRATE position, adjust calibrations control to full scale deflection, select proper channel on radio receiver, calibrate recorder and select operating range, turn on chart paper motor, change data converter switch from CALIBRATE to TEMPERATURE, launch the sensing unit, and monitor the recorder and radio receiver. When signal transmission begins, note the position of aircraft, and the date and time on the recorder chart paper. When the drop is completed the chart paper is stopped and the converter is turned back to CALIBRATE position or to OFF position depending upon requirements.

The trace obtained may be read immediately by placing a special plastic template over it which shows temperature/depth reference points. The data may then be relayed via radio. The strip charts showing measurements will be returned to the aircraft's base (carrier or airfield) for transmission to a Data Processing Center. At this writing proposals have been submitted by contractors to modify the EEBT so as to present a digitized tape read-out. Even so the recorder will still be retained as a device to determine malfunction and also to provide an immediate reading if desired..

3. Maintenance -

Operator maintenance of the airborne equipment will include malfunction determination and minor repairs, such as changing tubes and electrical connections. In the event that the converter or the recorder malfunction, they will have to be removed after the mission, another unit substituted, and the defective units sent to a repair facility. Trouble-shooting and localization of malfunction will comprize the primary maintenance functions of the operator.

Repair of the converter and the recorder involve extensive specialized training which is not considered to come within the purview of first echelon maintenance. It should be sufficient for the operator to identify which unit is malfunctioning, and to determine if the malfunction involves anything superficial which could be readily repaired or replaced. Defective equipment will be forwarded to repair facilities in accordance with established procedures.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that qualified personnel be given a specialized course of training to further qualify them in the operation and maintenance of the subject instrument as well as its ASWEPS application, and in related instruments carried on the same category of aircraft.

The figures presented below represent the number of men by rate and by category of aircraft, recommended for training in the operation of the EEBT:

For Land-Based Oceanographic Reconnaisance Flights,

AT-2 or AT-3	10

For Carrier-Based ASW Aircraft,

AT-2 or AT-3	24

For Land-Based ASW Patrol Aircraft,

AT-2 or AT-3	12
TOTAL:	46

DUTY TITLE: Airborne Radiation Thermometer (ART) Operator

PLATFORMS: Land-Based Oceanographic Reconnaisance Aircraft, Carrier-Based ASW Aircraft, and Land-Based ASW Patrol Aircraft

RECOMMENDED RATING/RATE:
AT-2 or AT-3

ALTERNATE RECOMMENDED RATING/RATE:
None

RECOMMENDED NEC: None

INSTRUMENT DESCRIPTION:

The Airborne Radiation Thermometer (ART) is an instrument designed to measure the surface temperature of the ocean by measuring the infrared radiation emitted from the surface. The instrument is mounted in an aircraft in such a manner that a sensing head looks down on the ocean. Temperature of the area under observation is continuously indicated on a panel meter located on the ART's control panel and simultaneously the information is presented on a strip paper chart recorder to provide a permanent record of the observation.

DUTY DESCRIPTION:

1. Installation -

In the present stage of development the ART must be installed in the aircraft prior to missions and removed at the conclusion of the mission or at the conclusion of a series of missions which take place consecutively. In the future the instrument may be permanently installed. The instrument is secured to the camera mounting ring by mounting appendages provided on the base of the cabinet for this purpose. If the instrument has not been in regular use, it should be bench-tested prior to installation to determine if it is functioning correctly.

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This is done by placing the instrument on a bench mounting with the sensing head looking down on a container of water. The water temperature is measured for comparative purposes and increased and decreased while the ART is run through its operating range. At a convenient time the chart paper supply should be checked and replenished if necessary. The trace on the chart paper is made by a heat process so that there is no ink supply to be checked. After the ART is secured in the aircraft, two pieces of ancillary equipment must be connected-a converter and a constant voltage transformer which are in turn hooked into the aircraft power source.

2. Operation -

The sequence of operation for the ART is as follows: Place the CONTROL switch in the STANDBY position and allow the equipment to warm-up for at least thirty minutes; open the shutter at the base of the cabinet by turning the CONTROL switch to the OPERATE position and observe the sea surface temperature panel meter; select the proper temperature range using the TEMPERATURE RANGE switch to bring the sea water surface temperature meter needle within the scale; unlock the recorder pens; observe the Sea Water Surface Temperature panel meter and strip chart recorder and read the temperature from the scale corresponding to the illuminated color lamp. Both the recorder and the meter will indicate approximately the same temperature, but only the recorder will be read for accurate temperature data. The strip chart must be annotated to show time and position (latitude and longitude) of the observation.

When fog or clouds intervene between the instrument and the sea surface the instrument will not record. Notations must be made on the strip chart if these conditions occur.

At the conclusion of the mission the strip chart is removed and the data obtained is encoded in digits showing time, location, and temperature. This information may be relayed to the Sea-Based Environmental Processing Unit via radio. The strip chart itself is also sent to the Sea-Based Environmental Unit.

3. Maintenance -

Operator maintenance requirements for this instrument will consist primarily of malfunction determination, tube replacement, and emergency repairs. These repairs will consist of checking circuits and power sources and replacement of major instrument assemblies. The instrument operator's manual provides a trouble-shooting checklist showing symptoms, probable causes, and repairs of several malfunctions which will fall into the category of first echelon maintenance. Work with prototype models of the ART indicates that due to its complex design, it will be necessary to send the instrument to a repair facility for most malfunctions. The operator's maintenance duties will consist primarily of determining malfunction, trouble-shooting, localizing the malfunction in a major assembly, changing the assembly and sending the defective assembly to a repair center or other appropriate facility in accordance with established procedures. The only lubrication or cleaning functions necessary are cleaning the recorder pens periodically. The frequency meter and the ohmeter are used to determine the consistency of power supply.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training:

It is recommended that qualified personnel be given specialized course of instruction to further qualify them in the operation and maintenance of the subject instrument as well as its ASWEPS application, and in related instruments carried on the same category of aircraft.

The figures presented below represent the number of men by rate and by category of aircraft recommended for training in the operation of the ART:

For Land-Based Oceanographic Reconnaisance Flights,

AT-2 or AT-3	10

For Carrier-Based ASW Aircraft,

AT-2 or AT-3	24

For Land-Based ASW Patrol Aircraft,

AT-2 or AT-3	12
TOTAL:	46

DUTY TITLE: Sonobuoy Operator

PLATFORMS: Land-Based Oceanographic Reconnaisance Flights, Carrier-Based ASW Aircraft, and Land-Based ASW Patrol Aircraft

RECOMMENDED RATING/RATE:
AT-2 or AT-3

ALTERNATE RECOMMENDED RATING/RATE:
None

RECOMMENDED NEC: None

INSTRUMENT DESCRIPTION:

The Sonobuoy is an instrument designed to detect underwater sounds, more specifically the sounds generated by a submarine, and to transmit these sounds by radio signal. These signals are picked up by a radio receiver in the mother aircraft and monitored by the operator on head-phones and on a strip chart recorder. The instrument system consists of four major assemblies: The sonobuoy itself (which is a sensor assembly launched from the aircraft), the radio receiver, the converter, and the strip chart recorder. The sonobuoy is a floating container for a small radio transmitter which transmits to the receiver in the aircraft all underwater sounds detected by its hydrophone. The sonobuoy is expendable.

DUTY DESCRIPTION:

1. Installation -

The sonobuoys are loaded into aircraft launching chutes before the mission by Ordnancemen. The operator should assure that a supply of strip chart paper has been installed in the recorder and that the electrical connections have been checked for proper hook-up. The instrument is now ready to take observations after the sonobuoy is launched.

2. Operation -

The sonobuoys are launched from their chutes by remote control after the aircraft is airborne. To receive sonobuoy signals the sequence of operations is as follows: Turn on power; set radio receiver to proper channels to receive sonobuoy signals; adjust radio set for maximum signal reception as monitored by earphones; turn on and adjust recorder for proper deflection; and monitor sound transmission and recorder. The sonobuoy operator communicates directly with the aircraft commander, informing him of what return is received from the sonobuoy. This information is also transmitted via radio to Data Processing Centers. The tapes from the recorder are removed at the end of the mission for evaluation, after which they are forwarded to an appropriate Data Processing Center. After dropping a sonobuoy pattern, the receiver controls may be set for "STANDBY" position or "OFF" position.

The sonobuoy is so designed that all operating adjustments and preparation for use are made at the time of manufacture. Maintenance of the airborne receiver and recording equipment will include: Checking of circuitry, testing of tubes and fuses, conducting first echelon repair of the receiver, and trouble-shooting the recorder. In the event that the recorder or converter malfunction the units will have to be removed and another assembly substituted in their place. The defective equipment will then be forwarded to an instrument repair center in accordance with established procedures.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that qualified personnel be given a specialized course of training to further qualify them in the operation and maintenance of the subject instrument, its ASWEPS application, and in its relationship to other instruments carried on the same category of aircraft.

The figures presented below represent the number of men by rate and by category of aircraft recommended for training in the operation of the Sonobuoy and related equipment:

For Land-Based Oceanographic Reconnaisance Flights,

AT-2 or AT-3	10

For Carrier-Based ASW Aircraft,

AT-2 or AT-3	24

For Land-Based ASW Patrol Aircraft,

AT-2 or AT-3	12
TOTAL:	46

DUTY TITLE: Helicopter Bathythermograph Operator

PLATFORMS: Helicopters

RECOMMENDED RATING/RATE:
SO(A)-2 or SO(A)-3

ALTERNATE RECOMMENDED RATING/RATE:
None

RECOMMENDED NEC: None

INSTRUMENT DESCRIPTION:

The Helicopter Bathythermograph (HBT) is a mechanical Bathythermograph modified for use in a helicopter. It is an instrument designed to measure water temperature as a function of depth and to make a permanent graphical record of this measurement. The modification of the Bathythermograph for helicopter use consists of removing the nose plate and installing a plug with a loop to which a winch cable is attached when in operation. A winch is installed inside the helicopter from which the HBT is lowered into the ocean while the helicopter hovers.

DUTY DESCRIPTION:

1. Installation -

Modify the mechanical Bathythermograph for helicopter use by removing the BT nose plate and installing a plug with a loop for attachment to the winch cable. Install winch in helicopter by attaching it to clip rack. Provide supply of glass slides for instrument. Load HBT in helicopter.

2. Operation -

The helicopter is flown to the desired location and brought to hover. The HBT operator installs a glass slide inside the instrument. The instrument is attached to the winch cable, lowered into the ocean to the prescribed

depth, raised again, and brought back on board the aircraft. The slide is removed. The BT serial number, time, date, and position of the observation is scratched onto the slide with a pencil point and the slide is stored in a box provided for that purpose.

When the slides containing the temperature/depth measurement are returned to the helicopter's base of operation they are interpreted by comparing them to a grid calibrated to the instrument from which the observation was taken. This is done by placing the slide and the grid in a special viewer. The information thus obtained, along with other pertinent data such as time, date, position, etc., is entered in a BT log sheet from which it may be transferred to a radio log sheet and subsequently encoded and transmitted via radio to the appropriate Data Processing Center. The slides are forwarded to the Hydrographic Office for further evaluation and storage.

3. Maintenance -

Maintenance and storage requirements for the HBT are the same as for the Mechanical BT. The instrument should be rinsed with fresh water at the conclusion of each mission and treated with rust preventive compound at least once per week. It should not be stored near sources of heat nor remain in hot sunshine for excessive periods. In the event that the instrument malfunctions it is not recommended that local repair be attempted except in cases where no subsitute BT's are available. If the instrument proves defective it should be sent to an instrument repair facility in accordance with established procedures.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that a brief course of instruction in the operation and maintenance of the HBT by established. The operation of the HBT is relatively simple and for that reason it is not considered necessary or desirable to establish a continuing special course of training in its use. The number of men selected for training will depend on how many organizations are involved, which is a factor as yet undermined. Special courses will be established thru the Wing Training Officers to which qualified Personnel will be assigned to receive this specialized training.

The total number of operators requireing training for the Service Test is:

SO(A)-2 or SO(A)-3 18

DUTY TITLE: Maintenance Man for Oceanographic Buoy & Sensor Package

PLATFORM: Oceanographic Buoy

RECOMMENDED RATING/RATE: ET-2 or ET-3, USCG

ALTERNATE RECOMMENDED RATING/RATE: None

RECOMMENDED NEC: None

INSTRUMENT DESCRIPTION:

The Oceanographic Buoy and instrument package is an instrument assembly designed to measure various parameters in the ocean environment, such as temperature and depth, air temperature and pressure, wind velocity and direction. The data so collected is automatically transmitted by internal radio transmitter to the appropriate Data Procession Center. The oceanographic buoy itself is a vehicle resembling a small boat, which is anchored in an area of the ocean remote from frequently travelled lanes. It contains radio transmitting equipment and power supplies designed to automatically transmit various data which is collected by a sensor package attached to the buoy. The sensor package contains a thermistor chain, an anemometer and an air-temperature thermometer.

DUTY DESCRIPTION:

1. Installation -

Negotiations for the installation of the oceanographic buoys have not yet been completed, but it is anticipated that this function will be assigned to the Coast Guard who will also maintain the instrument. The buoy with sensor package will be anchored in pre-selected positions in the ocean, the sensing equipment adjusted and the transmitter activated. The equipment will then operate automatically and require only periodic maintenance.

2. Operation -

Since the equipment is designed to operate automatically it will not be manned.

3. Maintenance -

It is presently anticipated that maintenance for the oceanographic buoys will be performed by Coast Guard patrols on a contract basis. Maintenance functions will include checking the equipment to determine if it is operating properly, trouble-shooting and repairing or substituting malfunctioning elements and replacing sensors and batteries.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that qualified personnel be given a special course of instruction to further qualify them in the installation and maintenance of the subject equipment.

The figures listed below represent the recommended number of personnel to be selected and trained for the maintenance of the subject platform and equipment:

USCG, ET-2 or ET-3 24

DUTY TITLE: Thermocline Recorder Operator

PLATFORM: Research Tower

RECOMMENDED RATING/RATE: Civilian

ALTERNATE RECOMMENDED RATING/RATE: None

INSTRUMENT DESCRIPTION:

The Thermocline Recorder is an instrument designed to provide measurements of temperature as a function of depth at fixed intervals in the ocean. It consists of a series of thermistors (sensing elements) set at fixed intervals on a cable which is suspended in the ocean. The resistance of the sensing element is detected sequentially, converted to a temperature and recorded on either a potentiometer strip-chart recorder or digitized on tape. The Thermocline Recorder consists of a thermistor chain, an electronic programming console, and a flexowriter and/or potentiometer strip-chart recorder.

DUTY DESCRIPTION:

1. Installation -

The thermistor chain is put into operation by placing thermistors on the cable at desired intervals and lowering the cable into the ocean. The thermistor chain is then connected to the programming console and the console to the flexowriter and/or recorder. If a recorder is used, install a supply of strip-chart paper and ink (unless the recorder uses a "hot stylus"). Install paper and tape in the flexowriter.

2. Operation -

After installation is completed, the operator must calibrate and adjust the programming console so as to obtain the desired readings from the thermistors. The recorder and flexowriter must also be checked for proper operation and read-out. The general procedure for calibrating and adjusting the programming console is as follows: Using the thermistor resistance factor as listed by the manufacturer, calculate values to be set into the "padding" resistors on the console; adjust the series of dials, to set the values; set into the console a resistance value corresponding to an even degree of temperature. Adjust the console until the temperature is shown on the read-out (the adjustment is made by physically turning a series of inset screws until the flexowriter shows another read-out which is the same as the dial settings mentioned previously). The instrument is calibrated when the print-out shows precisely the temperature which has been set into it.

The Thermocline Recorder is monitored by the operator on watch. The programming console will need to be readjusted from time to time in order to obtain the desired readings. Readjustment of the thermistors is required in order to obtain readings at different depths under differing conditions.

Automatic telemetering will probably be employed to transmit the data. Spools of digitized tape containing data will be stored for later forwarding to the Hydrographic Office.

3. Maintenance -

Thermistors must be changed from time to time, probably on the order of once per month in as much as they are fragile and subject to frequent breakage. The operator performs routine checks of the equipment replacing necessary components such as fuses, thermistors, batteries, and tubes. He must adjust the in-line print-out on the flexowriter and change paper supply in the recorder.

The operator must also make minor repairs to the equipment, localize malfunctions and change major assemblies. Defective assemblies will be removed and new assemblies will be substituted. The repair of major assemblies will not be feasible on the platform. The defective assembly should be forwarded to an equipment repair facility in accordance with established procedures.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

An On-the-Job Training Course is recommended for qualified civilian personnel who will man the Research Tower on which the Thermocline Recorder is mounted. The individuals selected for this duty will be Hydrographic Office employees. It is recommended that OJT be given at and by the Hydrographic Office, and include training in the subject instrument as well as related instruments to be mounted on the same platform, and in ASWEPS application.

The recommended number of men to be trained in the operation of the subject equipment is:

Civilians* 8

2. Selection Criteria -

Personnel selected should possess a background in electronics and oceanography and should have a minimum of six months employment experience in oceanographic instruments.

*Will be replaced by military personnel during wartime situation.

DUTY TITLE: Current Meter Operator

PLATFORM: Research Tower

RECOMMENDED RATING/RATE: Civilian

ALTERNATE RECOMMENDED RATING/RATE: None

RECOMMENDED NEC: None

INSTRUMENT DESCRIPTION:

The Current Meter is an instrument designed to measure the velocity of ocean currents. The current meter is a small device with plastic rotors which is suspended in the ocean from a stationary platform such as the Research Tower. It is connected by electrical wiring to a recorder and a tape chronograph.

DUTY DESCRIPTION:

1. Installation -

The current meter is suspended in the ocean from the platform at a predetermined depth. Electrical circuits are connected between the instrument and the display equipment, and the equipment is adjusted and calibrated until proper readout is achieved.

2. Operation -

Once the equipment is properly installed it need only be monitored. If a recorder is used alone, the data must be correlated and tabulated. For future operation the data may be automatically telemetered for transmission to a Data Processing Center, in which case the recorder would be used primarily to determine if the equipment is functioning properly.

3. Maintenance -

Supplies of tape and/or chart paper must be replenished

in the display equipment periodically. If the current meter malfunctions it should be removed and another unit substituted. Malfunctions of display equipment will require trouble-shooting the gear to determine which unit is defective. The defective unit will be removed and forwarded to an instrument repair center in accordance with established procedures.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

A course of On-the-Job Training will be given to qualified personnel by the Hydrographic Office to further qualify them in the operation and maintenance of the instrument.

Personnel listed below will require training in the operation and maintenance of the subject instrument, as well as other instruments on the platform as indicated:

Research Tower, Civilian Technicians* 8

2. Selection Criteria -

A technical background and experience in oceanography is desirable. The personnel selected should have a minimum of six months employment experience in oceanographic instrumentation.

*Will be replaced by military personnel during wartime situation.

DUTY TITLE: Tide Guage Operator

PLATFORMS: Research Tower and Oceanographic Shore Stations

RECOMMENDED RATING/RATE: Civilian

ALTERNATE RECOMMENDED RATING/RATE: None

RECOMMENDED NEC: None

INSTRUMENT DESCRIPTION:

The portable tide guage is an instrument designed to measure the rise and fall of the tide. The tide guage assembly consists of an eight-day clock driving a recorder drum, a spring loaded recording pencil operated by a float, and a float attached to a wire which is lowered through a length of pipe to water level. The recording mechanism is housed in a metal case which is approximately 18" in length, 14" deep, and 18" wide. Its weight is approximately 40 pounds. When in operation it must be secured to a pier or other mooring device and suspended above the water.

DUTY DESCRIPTION:

1. Installation -

Before attempting to install the Tide Guage it is necessary to secure the services of a surveyor who ties the mean water level to a bench mark and places a marker at the site selected for the observation. The installation team then secures a length of pipe approximately four inches in diameter and twenty feet long (this pipe is not an integral part of the Tide Guage and must be procured). The pipe is attached to the bottom of the Tide Guage and secured to the mooring in an absolutely vertical position. The float on the Tide Guage is attached to a wire and lowered through the pipe to the water level. A supply of paper is installed in the recorder drum and the clock mechanism is wound. The instrument is now ready to begin taking observations.

2. Operation -

Once the Tide Guage is installed it will record observations automatically and need only be monitored. There are certain adjustments which must be made between installation and recording which are as follows: The mean water level is marked on the paper on the recorder drum; the recorder drum is adjusted to proper tension with a key provided for that purpose; and the stylus is placed on the proper hour marking on the calibrated paper in the recorder drum. The paper in the recorder drum is so calibrated that measurements may be read from it directly and the data recorded on appropriate log sheets. The data obtained is transmitted to an appropriate Data Processing Center.

3. Maintenance -

The Tide Guage will require little in the way of maintenance once it is in operation. The only component of this instrument which might be subject to malfunction is the clock mechanism and it is not anticipated that the repair of this mechanism will be feasible for the operator. If the clock mechanism becomes inoperative it will be necessary to replace the entire Tide Guage and forward to an instrument repair facility in accordance with established procedures. The clock mechanism should be wound on alternate days, and the paper supply on the recorder changed as expended.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

An On-the-Job Training Course is recommended for qualified personnel to further qualify them in the operation and maintenance of the subject instrument as well as its ASWEPS application. These individuals will be Hydrographic Office employees, and it is recommended that the On-the-Job Training be given by the Hydrographic Office. Training in related instruments on the same platform will be provided the same time.

The figures presented below show the recommended number of men to be trained in the operation and maintenance of the subject instrument for each platform on which the instrument is to be mounted:

For the Research Tower,

Civilians*	8

For Shore Stations,

Civilians*	6
TOTAL:	14

2. Selection Criteria --

Personnel to be selected should have a general technical background and should have a minimum of six months employment experience in oceanographic instrumentation.

*Will be replaced by military personnel during wartime situation.

THE INSTRUMENTS DESCRIBED IN THE FOLLOWING PAGES ARE THOSE WHICH ARE STILL IN AN EARLY STAGE OF DEVELOPMENT. IN MOST CASES THE FINAL FORM WHICH THE INSTRUMENT WILL TAKE AND ITS SEQUENCE OF OPERATION IS AS YET UNDETERMINED. THE SUBJECT INSTRUMENTS DO NOT READILY YIELD THEMSELVES TO A DETAILED DUTY DESCRIPTION. FOR THIS REASON AN ABBREVIATED FORM HAS BEEN USED COMBINING THE INSTRUMENT AND DUTY DESCRIPTION.

DUTY TITLE: Shipboard Wave Recorder Operator

PLATFORMS: USN Radar Picket-Barrier Ships, USCG Ocean Station Vessels, Carriers, Research Towers

RECOMMENDED RATING/RATE: AG-2 or AG-3

ALTERNATE RECOMMENDED RATING/RATE: SO-2 or SO-3 (USCG) or Civilians

RECOMMENDED NEC: None

INSTRUMENT & DUTY DESCRIPTION:

The shipboard Wave Recorder (SWR) is an instrument intended to measure ocean wave period and amplitude by sonic radar principles and to provide a record of this measurement. The instrument is still in an early stage of development and its form and sequence of operation are not yet known. It is anticipated that the equipment will consist of a dock-mounted sensor package which will look down on the water, and a display unit which will probably be a strip-chart recorder. It is estimated that the operation and monitoring of the SWR will be within the capability of one man. The equipment will be dock-installed by technicians prior to the vessel's embarkation. (On the Research Tower the instrument is called a Wave Recorder).

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that qualified personnel be given a specialized course of training to further qualify them in the operation and maintenance of the subject instrument. A course of On-the-Job training is recommended for civilian operators, to be given by the Hydrographic Office.

The figures presented below represent the number of men by rate and by platform recommended for training in the operation of the Wave Recorder:

For USN Radar Picket-Barrier Ships,

AG-2 or AG-3	24

For Carriers,

AG-2 or AG-3	6

For USCG Ocean Station Vessels,

SO-2 or SO-3	42

For the Research Tower,

Civilians*	8
TOTAL:	80

2. Selection Criteria -

Civilian personnel selected should have an electronic background and should have a minimum of six months employment experience in oceanographic instrumentation.

*Will be replaced by military personnel during wartime situation.

DUTY TITLE: Turbidity-Depth Meter Operator

PLATFORMS: USN Radar Picket-Barrier Ships, USCG Ocean Station Vessels, Submarines, Research Tower

RECOMMENDED RATING/RATE: SO-2 or SO-3

ALTERNATE RECOMMENDED RATING/RATE: Civilian

RECOMMENDED NEC: None

INSTRUMENT & DUTY DESCRIPTION:

The Turbidity-Depth Meter is an instrument designed to provide an index of the concentration of dissolved foreign matter at various depths in the ocean. At the time of this writing the instrument is in a very early stage of development so that its final form and method of operation have not yet been determined. It is anticipated that the instrument will consist of a sensor package, which is immersed in the water, and a display unit. The form of the instrument read-out has not yet been established, but it is anticipated that the operator will be required to perform a calibration function to convert the collected data into usable form.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that qualified personnel undergo courses of specialized training to further qualify them in the operation and maintenance of the equipment. For civilian personnel a course of On-the-Job Training is recommended to be given by the Hydrographic Office.

The following figures represent the number of men by rate and by platform recommended for training in the operation and maintenance of the Turbidity-Depth Meter:

For USN Radar Picket-Barrier Ships,

SO-2 or SO-3	24

For Submarines,

SO(SS)-2 or SO(SS)-3	12

For USCG Ocean Station Vessels,

SO-2 or SO-3	42

For the Research Tower,

Civilians*	8
TOTAL:	86

2. Selection Criteria -

Civilian personnel selected should have a background in electronics and should have a minimum of six months employment experience in oceanographic instrumentation.

*Will be replaced by military personnel during wartime situation.

DUTY TITLE: Shipboard Sensor Package Operator

PLATFORMS: USN Radar Picket-Barrier Ships, and USCG Ocean Station Vessels

RECOMMENDED RATING/RATE: SO(G)-2 or SO(G)-3

ALTERNATE RECOMMENDED RATING/RATE: None

RECOMMENDED NEC: None

INSTRUMENT & DUTY DESCRIPTION:

The Shipboard Sensor Package, which is equipment projected for future development, is designed to measure temperature and sound velocity as a function of depth in the ocean and to provide a record of such measurement. Functionally, it will combine the elements of the Electronic Bathythermograph and the Sound Velocity Meter. The form, method of operation, and read-out of the instrument have not yet been determined, but it is anticipated that it will consist of a housed sensor package, which is lowered into the ocean, and a display unit which will probably be a strip-chart recorder. The operation and maintenance of the instrument will be similar to that of the Shipboard Electronic Bathythermograph described earlier in this report. It is to be noted that this instrument has not yet been included in revisions of the ASWEPS Technical Development Plan.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

A course of specialized training is recommended for qualified personnel in order to further qualify them in the operation and maintenance of the subject instrument as well as in its ASWEPS application.

Projected numbers of men requiring training in the operation and maintenance of the subject equipment are:

For USN Radar Picket-Barrier Ships,

SO(G)-2 or SO(G)-3 24

For USCG Ocean Station Vessels,

SO-2 or SO-3 42

TOTAL: 64

It is to be noted that the above personnel requirements are not imposed in the Platform Analysis in the previous section of this report. This is omitted at this time since the instrument does not appear in the revised Technical Development Plan.

DUTY TITLE: Airborne Sea and Swell Recorder Operator

PLATFORMS: Land-Based Oceanographic Reconnaisance Flights and Land-Based ASW Patrol Aircraft

RECOMMENDED RATING/RATE: AT-2 or AT-3

ALTERNATE RECOMMENDED RATING/RATE: None

RECOMMENDED NEC: None

INSTRUMENT & DUTY DESCRIPTION:

The Airborne Sea and Swell Recorder is an instrument designed to measure ocean wave amplitude and period. The instrument employs radar principles to provide a record of such measurement. The Hydrographic Office is presently considering manufacturer's proposals for a prototype of this instrument. Due to its early stage of development, the exact form and sequence of operation for the instrument is not yet known. It is anticipated that the instrument will use an external disc-type radar antenna and will have several rack-mounted units inside the aircraft, including a display unit which will probably be a strip-chart recorder. It is further anticipated that one man will be able to monitor and operate this instrument.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that qualified personnel be given a specialized course of training to further qualify them in the operation and maintenance of the subject instrument, its ASWEPS application, and in related instruments carried on the same category of aircraft.

The figures presented below represent the number of men by rate and by category of aircraft recommended for training in the operation of the Airborne Sea and Swell Recorder:

For Land-Based Oceanographic Reconnaisance Flights,

AT-2 or AT-3 10

For Land-Based ASW Patrol Aircraft,

AT-2 or AT-3 12

TOTAL: 22

DUTY TITLE: Airborne Sensor Package Operator

PLATFORM: Land-Based Oceanographic Reconnaisance Flights, Carrier-Based ASW Patrol Aircraft, and Land-Based ASE Patrol Aircraft

RECOMMENDED RATING/RATE: AT-2 or AT-3

ALTERNATE RECOMMENDED RATING/RATE: None

RECOMMENDED NEC: None

INSTRUMENT AND DUTY DESCRIPTION:

The Airborne Sensor Package is another instrument projected for future development and not presently included in the ASWEPS Technical Development Plan. It is an instrument package intended to combine the functions of the Electronic Airborne Bathythermograph, The Airborne Sea and Swell Recorder, and the Airborne Radiation Thermometer. The form and operation of this equipment have not yet been determined.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

If the subject instrument is developed and adapted for the ASWEPS Service Test, it is recommended that qualified personnel attend a specialized course of training to further qualify them in the operation and maintenance of the subject equipment as well as in its ASWEPS application.

Projected numbers of men requiring training in the operation and maintenance of the subject equipment are:

For Land-Based Oceanographic Reconnaisance Flights,

AT-2 or AT-3 10

For Carrier-Based ASW Aircraft,

AT-2 or AT-3 24

For Land-Based ASW Patrol Aircraft,

AT-2 or AT-3 12

TOTAL: 46

As with the Shipboard Sensor Package personnel requirements are not included in the Platform Analysis given in the previous section of this report.

DUTY TITLE: Standard Sound Source Operator

PLATFORMS: Land-Based Oceanographic Reconnaisance Flights, Carrier-Based ASW Aircraft, Land-Based ASW Patrol Aircraft

RECOMMENDED RATING/RATE: AT-2 or AT-3

ALTERNATE RECOMMENDED RATING/RATE: None

RECOMMENDED NEC: None

INSTRUMENT AND DUTY DESCRIPTION:

The Standard Sound Source (SSS) is a device designed to provide a constant signal which is used for range evaluation of the Snonbuoy. It enables the operator of the Sonobuoy gear to measure precisely the maximum effective range of his instrument at specific depths. The SSS is launched from the mother aircraft into the ocean where it will hover at any pre-set depth down to 1,000 feet. It emits a signal at a set frequency with constant power which is picked up by the Sonobuoy. It may be regarded in a certain sense as a "target simulator" inasmuch as it enables the operator to determine the maximum operating range of his equipment at a given place in the ocean. The instrument is intended to be expendable and small, probably somewhat smaller than a basketball. It is in a very early stage of development with only one proposal having been submitted for its further development. The exact form and method of operation of this instrument has not yet been determined. It is anticipated that no maintenance function will be required since the item is expendable. Its operation will consist only in launching it from the aircraft in a pre-determined pattern.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that qualified personnel be given a specialized course of training to further qualify them in the

operation and maintenance of the subject instrument as well as its ASWEPS application and in related instruments carried on the same category of aircraft.

The figures presented below represent the number of men by rate and by category of aircraft recommended for training in the operation of the Standard Sound Source:

For Land-Based Oceanographic Reconnaisance Flights,

AT-2 or AT-3 10

For Carrier-Based ASW Aircraft,

AT-2 or AT-3 24

For Land-Based ASW Patrol Aircraft,

AT-2 or AT-3 12

TOTAL: 46

[redacted] UNCLASSIFIED

DUTY TITLE: Temperature/Salinity Depth Recorder Operator

PLATFORMS: Submarines and Research Tower

RECOMMENDED RATING/RATE: SO(SS)-2 or SO(SS)-3

ALTERNATE RECOMMENDED RATING/RATE: Civilian

RECOMMENDED NEC: None

INSTRUMENT AND DUTY DESCRIPTION:

The Temperature/Salinity Depth Recorder is an instrument designed to measure salinity as a function of depth in the ocean and to provide a record of such measurement. The instrument is in a very early stage of development and its final form and operating procedure have not yet been determined. It is believed that this instrument may later be combined with the Electronic Bathythermograph to form a sensor package. Although several commercial firms are believed to have done preliminary work on such an instrument, no specific development for ASWEPS application has yet been accomplished.

RECOMMENDED QUALIFICATIONS AND TRAINING:

1. Training -

It is recommended that Submarine personnel be given a course of training in the operation and maintenance of the subject equipment. A course of On-the-Job Training given by the Hydrographic Office is recommended for civilian personnel.

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UNCLASSIFIED [redacted]

The figures given below represent the number of personnel recommended for selection and training for operation of the subject instrument:

For Submarines,

SO(SS)-2 or SO(SS)-3 12

For the Research Tower,

Civilians* 8

TOTAL: 20

2. Selection Criteria -

Civilian personnel selected should have a general technical background and should have a minimum of six months employment experience in oceanographic instrumentation.

*Will be replaced by military personnel during wartime situation.

APPENDIX

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