CHAPTER 4

TECHNICAL PUBLICATIONS AND RECORDS

In addition to the training courses mentioned previously, there are various technical publications with which the ET must become familiar. These publications will be discussed in this chapter. Records concerning electronic equipments that you will either be required to maintain or have knowledge of are also discussed.

TECHNICAL PUBLICATIONS

Electronic technical publications include various handbooks, bulletins, and manuals published and distributed by the Bureau of Ships, and manufacturers' technical manuals. The Requisitioning Guide and Index of Forms and Publications, NavSandA-2002 furnishes a complete list of BuShips technical publications along with instructions for ordering copies.

HANDBOOKS AND BULLETINS

Handbooks present information about a particular field of work, or about a particular type of equipment, in a practical form. One such publication is the Handbook of Test Methods and Practices, NavShips 91828A (or the latest revision); others are the Handbook of Naval Shore Station Electronics Criteria, NavShips 92675, and the Electronic Test Equipment Handbook, NavShips 900-155.

One bulletin of great importance to the ET is the Electronics Information Bulletin (EIB), NavShips 900-022A, published biweekly for naval electronics activities. A complete file of these bulletins should be maintained.

This bulletin lists field changes and corrections that must be made in instruction books and other publications that are used in the maintenance of electronic equipment. It also lists electronics publications that become available, and gives valuable suggestions, from case histories, for servicing electronic equipment.

Although not called a bulletin as such, the Electronics Installation and Maintenance Book (EIMB), NavShips 900-000, includes essentially the summarized (permanent) information formerly contained in various service bulletins, such as the RMB, CEMB, EIB, and SB. For convenience, the EIMB comprises several volumes, covering general information of an electronics nature in each major electronics field. The present name of EIMB was changed from EMB.

At present the EIMB is being completely revised. This revision will be carried out in several steps, and includes incorporating into the EIMB the following NavShips publications; Reporting Electronic Equipment Installation, 900-135(B); Handbook of Test Methods and Practices Manual, 91828(A); Installation Practices Manual, 900-171; Antenna Details, 900-121(A); Basic Communication Systems Interconnection Wiring Plans, 900-176, Volume 1; Shipboard Radar and IFF System Design Plans, 900-176, Volume 2; and Shipboard Electronics Equipment Installation Plans, 900-153(A).

The Handbook of Electronic Circuits, NavShips 900-000.102, currently under preparation will include most conventional electronic circuits (oscillators, detectors, amplifiers, etc.) and their theory of operation. The new equipment technical manuals will not duplicate these explanations but will simply refer to them. In this way it is planned to reduce the amount of material in the theory portions of technical manuals associated with electronic equipments.

INSTALLATION AND MAINTENANCE MANUALS

Installation and maintenance manuals contain information concerning the installation, operation and maintenance of specific electronic equipments. This information is included in instruction books or technical manuals issued by

the manufacturers, and various BuShips publications.

Manufacturers Technical Manuals

Manufacturers technical manuals are prepared according to military specification MIL-M-15071 E, of 15 April 1962. This specification establishes four types of manuals and provides specific instructions for preparing each type. The types of manuals are: type 1, electrical and mechanical; type 2, electronic and special equipment; type 2a, experimental equipment; and type 3, systems. You will be concerned with the type 2 manual. The material in this manual is arranged in six sections as follows:

Section 1. General information—This section provides a functional description of the equipment and includes the capabilities, limitations, and relationship of the units.

Section 2. Installation—This section includes such information as primary power data, initial adjustment, inspection procedures, unpacking and handling, and installation requirements.

Section 3. Operation—This section includes routine and emergency operating instructions, safety precautions, and operating limits.

Section 4. Troubleshooting—Included in this section are all diagrams and information required by the ET to troubleshoot the equipment. This section includes the six-step method of troubleshooting discussed in chapter 13 of this training course.

Section 5. Maintenance—This section provides information and instructions necessary for maintaining and repairing the equipment. All preventive maintenance procedures and test inspections are included in this section if they are not included in a separate maintenance standards book.

Section 6. Parts list—This section includes a list of manufacturers, and data concerning maintenance parts for the equipment.

In addition to the material in sections 1 through 6, the manual contains front matter and an index.

Electronics Installation Practices Manual (EIPM), NavShips 900-171

The Electronic Installation Practices Manual (EIPM), NavShips 900-171, is composed of many separately bound chapters. This manual provides information on standard methods of installation of electronic equipments and systems.

Shipboard Antenna Details, (NavShips 900-121)

Shipboard Antenna Details, NavShips 900-121, is composed of several separately bound chapters, and is intended to serve as a source of information for those concerned with installing ship antennas.

Bureau of Ships Technical Manual, (NavShips 250-000)

The Bureau of Ships Technical Manual is an authoritative technical publication issued for the information and guidance of naval personnel, afloat and ashore, responsible for or engaged in the operation, maintenance, and repair of machinery, apparatus, and equipment under cognizance of the Bureau of Ships.

Chapter 67 of the manual is titled Electronics, and is required reading for electronics personnel. Additional chapters of the technical manual and various other publications are listed in chapter 67. These are informative and of value to electronics personnel.

MISCELLANEOUS PUBLICATIONS

The Bureau of Ships Journal, NavShips 250-200, is published monthly, and frequently carries articles of interest to Electronics Technicians. Other publications that will be helpful to you are, U.S. Navy Synchros, OP 1303; Radio Frequency Transmission Lines, NavShips 900-008; and Security Classifications of Electronic Equipment, NavShips 93140.

CORRECTIONS TO TECHNICAL PUBLICATIONS

It is important that all technical publications be kept up to date. You will be concerned with making corrections to the electronics technical publications. The corrections are distributed by BuShips as change sheets, as required.

These change sheets are detailed regarding the kind of entries (temporary or permanent) and their purposes. Many changes involve field changes covering specific serial numbers; when that condition applies, the entry is made only upon completion of the job. Be certain that holders of equipment accompanied by technical manuals do not make this correction in the manual until accomplishment of the field change.

Make pen-and-ink corrections in all entries and in all locations as specified. Make them clear and legible. Remember, such entries are permanent; therefore they must be readable.

Following the initial entry, review the change sheet instructions to be certain every requirement is fulfilled.

RECORDS

Each activity engaged in the operation of electronic equipment is required to maintain cards for recording the results of inspections of equipments, and records of any tests, repairs, and field changes made. The material history, composed of cards filed in looseleaf binders, supersedes the machinery history and hull repair books formerly required aboard ship. Such cards as the Machinery History Card, NavShips 527, Material History Card-Electrical, NavShips 527A, Electronic Equipment History Card, NavShips 536, and Hull History Card, NavShips 539, form the basis of the ship's material history. (ETs are responsible for NavShips 536 only.) These cards provide a comprehensive record of the items concerned. They are kept up to date and available for inspection at all times and are integrated into preventive maintenance programs such as the Current Ships Maintenance Project (CSMP).

The maintenance history cards that the ET3 should be especially familiar with are described in the following paragraphs.

ELECTRONIC EQUIPMENT HISTORY (CARD, NAVSHIPS 536)

This card is the basic maintenance history card for electronic equipment. It provides for recording failures and other information pertaining to electronic equipments. A separate card is filled in for each equipment and major unit on board. If additional cards are required for an equipment they are added behind the original card in the binder. All cards for a particular equipment are transferred with the equipment when it is removed from the ship.

The heading of the card should be typed, but entries on the body of the card may be either typed or written in ink or indelible pencil. The filling instructions should be followed closely in filling in the form, a sample of which is shown in figure 4-1.

Equipment Model Designation: All letters and numbers should be included to indicate the specific model. For instance, AN/GRC-27 should not be entered as AN/GRC or GRC-27.

Equipment Serial Number: This number is taken from the equipment nameplate. If an overall equipment number is not available, the serial number of the major unit is listed for the entire equipment. When it is definitely established that an item does not bear a serial number, an asterisk (*) is entered in this space. Cards are made up for each unit of an electronic equipment and placed together in the folder. For example, on the AN/SPA-33 the Azimuth-Range Indicator is listed as IP-442/SPA-33, the Power Transformer as TF-129A/SP, and the Power Supply as PP-560C/SP.

Card Number: The number in this space is "1" for each card in the original file. As additional cards for a specific equipment are filed, they are numbered consecutively.

Name of Contractor: Enter here the name of the contractor in full as given on the unit nameplate or in the technical manual.

Contract Number: The complete contract number includes all letters and numbers as given on the equipment or unit nameplate.

Date Installed: This space refers to the date the equipment or unit was installed. If the installation required several days, the date of completion is the date entered.

Installing Activity: This space is for the name of the activity that actually installed the equipment.

Box Number and Location: On ships with integrated parts system this space may be left blank, unless for some reason the equipment is not included in the system. Otherwise, the appropriate box number (and location) is entered in this space.

Instruction Book on Board: Check this space only when the final instruction book is received. If only the preliminary book is on board, this space should not be checked. EIB carries notices of the availability of final instruction books.

Date: Enter here the date of failure, field change, or other work involving maintenance or repair.

Nature of Trouble: External evidence of the equipment trouble is entered in this column and should be described in detail. Whenever a field change is made, the field change number and title are also shown in this column in addition to the entry required on the Record of Field Changes, NavShips 537.

Cause of Failure: This column is most important. Describe how the trouble was traced and what corrective measures were taken. Give detailed information. Note peculiarities and weaknesses. The clearer the information in this column, the more valuable it is to the ship, the Bureau of Ships, and the manufacturer. The information in this column, and that reported on the Defense Department Electronics Failure Report, DD787, assists in the production of better and more reliable equipment.

Some activities may wish to record in this column such information as the name and rate of the person actually doing or supervising the work, the man-hours consumed, and the signature of the Division Officer. Such entries are optional.

Name of Part: List here the names of the parts involved in the failure.

Circuit Symbol: Record here the symbol designations of the parts that failed, as shown in the instruction book.

Navy Stock Number: This space should be relabeled "Federal Stock number" or "FSN". If the federal stock number is unavailable, list the manufacturer's part number, or other identifying numbers.

Life Hours: Enter here the estimated life of the part. To obtain this figure, use the machinery history cards, readings of elapsed time meters that total the operating time of the part, or any other available data.

Date DD787 Mailed: (This column was formerly headed "Date NavShips 383 Mailed.") Record the mailing date if DD787 was mailed to the Bureau of Ships.

CURRENT SHIP'S MAINTENANCE PROJECT

The purpose of the current ship's maintenance project (CSMP) is to provide a current record of maintenance, modifications, and repairs to be scheduled and finally accomplished

ELECTRONIC EQUIPMENT HISTORY CARD NAVSHIPS 536 (Rev. 9-48)

AN/GRC-27A	1204	RECEIVER R-278B/GR	1
Equipment Model Designation	Equip. Ser. No.	Name of Unit and Type No.	Card No.

Name of Contractor	Contract No.	Date Installed	Serial No. of Unit
NATIONAL COMPANY, INC.	NXSR-55624	5 JULY 1961	1204

Location: RADIO ROOM C-201-L — Installing Activity: NNSY

Spare Parts — Box No. and Location: 2 CIC — Instr. Bk. On Board (Check): ☒

Date	Nature of Trouble (Or F. C. No. and Title)	Cause of Failure Brief Description of Work Done	Name of Part	Circuit Symbol	Navy Stock No.	Life Hours	Date NavShips-383 Mailed
10/6/62	NO SIGNALS	OPEN FILAMENT REPLACED	TUBE	V201	W5960-615 FSN	300	10/16/62
		V201			5528		
12/2/62	F.C. #4						
	MODIFICATION TO						
	IMPROVE STABILITY						
	OF I.F. AMPLIFIER						

Stocked in CDS

16—62366-3

1.2

Figure 4-1.—Electronic equipment history card, NavShips 536

by ship's personnel or by repair activities afloat or ashore.

The CSMP consists of the following three cards:

NavShips 529—Repair Record Card (blue)
NavShips 530—Alteration Record Card (pink)
NavShips 537—Record of Field Changes (white)

As a repair is required or an alteration is authorized, the work is scheduled by filling out an applicable CSMP card and placing it so the top line of the card is in view alongside the proper history card, NavShips 536. These CSMP cards are of a distinctive color, which facilitates the indication of outstanding work when the history is examined.

When the item of work has been completed, entries are made in two places. One entry of completion is made on the CSMP card, and the other entry is made on the history card, NavShips 536.

Upon completion of work, the Record of Field Changes, NavShips 537, remains with its NavShips 536. However, cards NavShips 529 and 530 are removed from their position adjacent to the history card and filed in a "completed work" section of the CSMP.

Repair Record Card, NavShips 529, and Alteration Record Card, NavShips 530

The blue repair and pink alteration cards are identical as to block descriptions, therefore, the description of the entries apply to both cards. Their distinctive colors aid in distinguishing repair from alteration projects.

Repair record cards and alteration record cards are retained for a period of 2 years, following which these cards may be destroyed at the discretion of the commanding officer. When ships are decommissioned or placed out of service during this period, the cards are retained onboard.

If the equipment is transferred, these cards are transferred with it.

Record of Field Changes, NavShips 537

Field changes scheduled and later made to any portion of an electronic equipment are recorded on this card, which is filed in the binder adjacent to the history card for the equipment to which the change is applicable. Completion of field change information is also entered on NavShips 536.

This record is of paramount importance. Without modifications, an equipment may be dangerously out of date and subject to numerous serious difficulties. Without a record of field changes it is difficult to determine what modifications, if any, have been made. The information recorded on these cards is essential for routine maintenance, for troubleshooting, and for ordering maintenance parts for the improved equipment.

Figure 4-2 shows the Record of Field Changes Card, NavShips 537. The spaces for equipment model designation, serial number, date installed, and card number are filled in by typing or writing with ink or indelible pencil. The official name or Navy type number (or other official identification) of each component affected by a field change is shown parenthetically after the title of a change.

The columns headed "No.," "Title of Field Changes," and "Authority for Change" are completed in numerical order for all changes affecting a specific equipment. Field changes that affect certain equipments are made known in the Electronics Installation and Maintenance Book (EIMB). Enter applicable extracts from EIMB on the NavShips 537 card to indicate exactly its EIMB source and language. The Electronics Information Bulletin (EIB) lists field changes and is also an authority for making such changes.

Do not use obsolete entries on NavShips 537.

Approximately once a year, the Bureau of Ships determines which EIBs become obsolete because their items are published elsewhere in permanent form (in EIMB and IB publications). For example, the initial 200 copies of EIB, were named Repair Information Bulletin (RIB) and these are canceled (as summarized in EIB 476) along with EIBs from serial numbers 1 through 380. Until further notice, serial numbers above 380 shall be considered authoritative and directive in nature for announcing field changes that are active.

Many field changes are issued directly from the Bureau to a ship. Whatever its source, list the authority for such changes in the column provided for it on NavShips 537.

EQUIPMENT FAILURE AND PERFORMANCE RECORDS

The Bureau of Ships must receive accurate reports from the fleet concerning equipment performance and failures, in order to evaluate it's reliability and maintainability. Reports are

also necessary to determine whether new equipments are meeting their design capabilities and operational requirements.

Reported failures are tabulated on IBM cards, and regular summaries are made to show at a glance the number and types of failures of any part of any equipment.

The importance of reporting failures and their causes cannot be too highly stressed, particularly if failures occur under actual operating conditions. The reports are to be filled in completely and in conformity with the instructions accompanying the card. Many reports received by the Bureau are valueless because they do not give the essential information required by the form or because the information given is incomplete. When indicating the model or type of equipment, include all significant nomenclature, letters, and digits.

Electronic Equipment Failure/Replacement Report, DD-787

Failures to electronic equipment are reported according to BuShips Instruction 10550.73. The Department of Defense has developed the new Electronics Failure Report Form, DD-787 (fig. 4-3), which replaces the corresponding failure report forms in use by each of the military departments. For naval activities, it supersedes an older DD-787.

One major distinction between the old and the new form DD787 is that the new form is an equipment/part failure report, while the old form was only a parts failure report.

The new report (fig. 4-3) and the Electronic Equipment Operational Time Log (discussed later) are submitted only upon failure of specified equipments. The initial list of specified equipments is shown in the previously referenced BuShips Instruction 10550.73. Additions and deletions will appear in the EIB, which must be checked in each biweekly issue because listed additions will change your reporting requirements.

The new DD-787 failure/replacement form is arranged so that all failure information relating to one equipment can be entered on the form. This should simplify the maintenance paperwork

NAVSHIPS 537 (7-47)

RECORD OF FIELD CHANGES

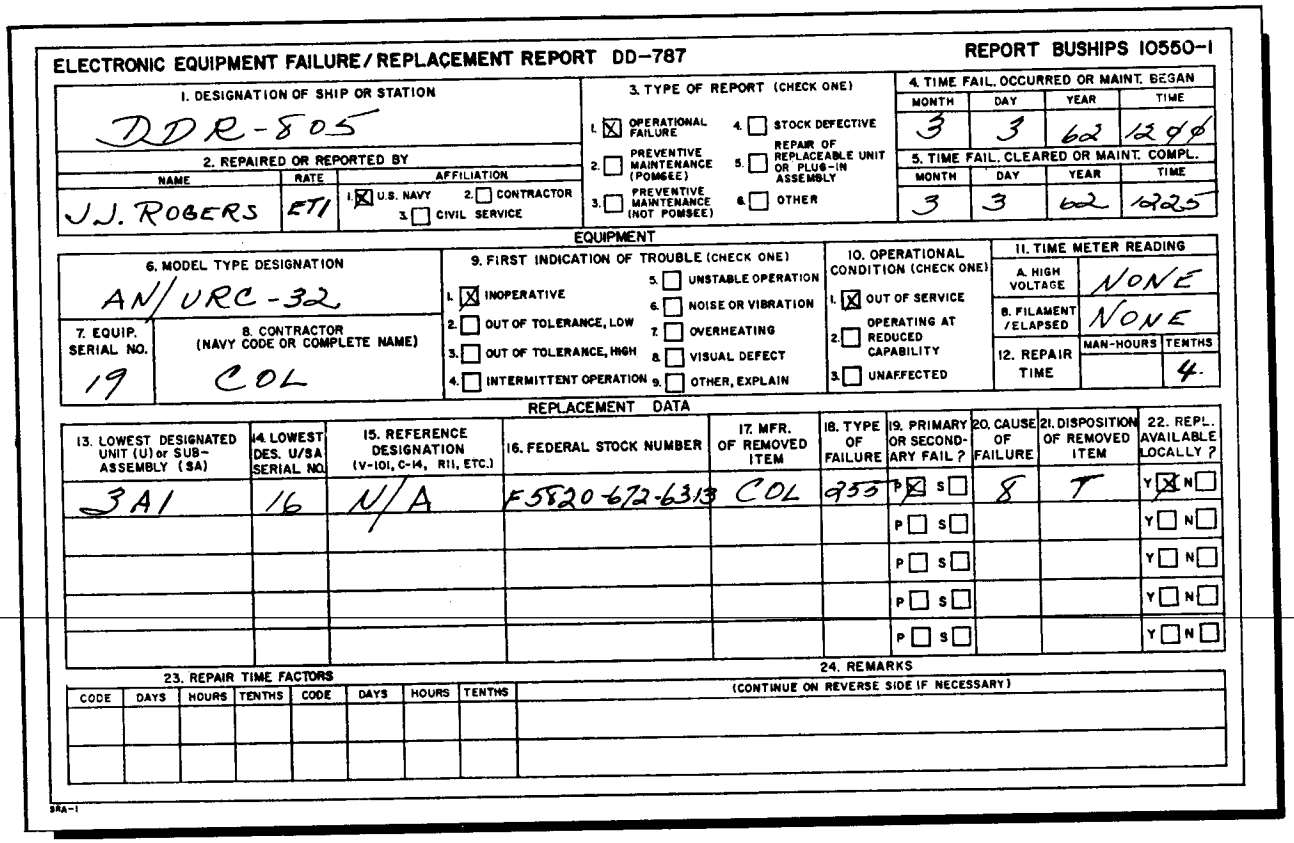
Stocked in CDS

AN/GRC-27A	1204	RECEIVER R-278B/GR			1
Equipment Model Designation	Serial Number	Date Installed	U. S. GOVERNMENT PRINTING OFFICE 16—52957-2		Card No.

NO.	TITLE OF FIELD CHANGE	AUTHORITY FOR CHANGE	CHANGE MADE BY	DATE OF CHANGE
1	REMOVAL OF C-149 CAPACITORS	BUSHIPS		
	NOT APPLICABLE			
2	ADJUSTMENT OF TUNING INDUCTANCE	BUSHIPS		
	NOT APPLICABLE			
3	BONDING FOR AUTO TONE UNIT	BUSHIPS	JR	5/9/61
4	MODIFICATION TO IMPROVE STABILITY	BUSHIPS	JR	2/12/61
	OF I-F AMPLIFIER			

1.4

Figure 4-2.—Record of field changes, NavShips 537.



ELECTRONIC EQUIPMENT FAILURE/REPLACEMENT REPORT DD-787 — REPORT BUSHIPS 10550-1

1. DESIGNATION OF SHIP OR STATION: DDR-805

2. REPAIRED OR REPORTED BY

NAME	RATE	AFFILIATION
J.J. ROGERS	ETI	1. [X] U.S. NAVY 2. [ ] CONTRACTOR 3. [ ] CIVIL SERVICE

3. TYPE OF REPORT (CHECK ONE): 1. [X] OPERATIONAL FAILURE; 2. [ ] PREVENTIVE MAINTENANCE (POMSEE); 3. [ ] PREVENTIVE MAINTENANCE (NOT POMSEE); 4. [ ] STOCK DEFECTIVE; 5. [ ] REPAIR OF REPLACEABLE UNIT OR PLUG-IN ASSEMBLY; 6. [ ] OTHER

4. TIME FAIL. OCCURRED OR MAINT. BEGAN

MONTH	DAY	YEAR	TIME
3	3	62	1200

5. TIME FAIL. CLEARED OR MAINT. COMPL.

MONTH	DAY	YEAR	TIME
3	3	62	1225

EQUIPMENT

6. MODEL TYPE DESIGNATION: AN/URC-32

7. EQUIP. SERIAL NO.: 19

8. CONTRACTOR (NAVY CODE OR COMPLETE NAME): COL

9. FIRST INDICATION OF TROUBLE (CHECK ONE): 1. [X] INOPERATIVE; 2. [ ] OUT OF TOLERANCE, LOW; 3. [ ] OUT OF TOLERANCE, HIGH; 4. [ ] INTERMITTENT OPERATION; 5. [ ] UNSTABLE OPERATION; 6. [ ] NOISE OR VIBRATION; 7. [ ] OVERHEATING; 8. [ ] VISUAL DEFECT; 9. [ ] OTHER, EXPLAIN

10. OPERATIONAL CONDITION (CHECK ONE): 1. [X] OUT OF SERVICE; 2. [ ] OPERATING AT REDUCED CAPABILITY; 3. [ ] UNAFFECTED

11. TIME METER READING

A. HIGH VOLTAGE	NONE	
B. FILAMENT /ELAPSED	NONE	
12. REPAIR TIME	MAN-HOURS	TENTHS
		4.

REPLACEMENT DATA

13. LOWEST DESIGNATED UNIT (U) or SUB-ASSEMBLY (SA)	14. LOWEST DES. U/SA SERIAL NO.	15. REFERENCE DESIGNATION (V-101, C-14, R11, ETC.)	16. FEDERAL STOCK NUMBER	17. MFR. OF REMOVED ITEM	18. TYPE OF FAILURE	19. PRIMARY OR SECONDARY FAIL?	20. CAUSE OF FAILURE	21. DISPOSITION OF REMOVED ITEM	22. REPL. AVAILABLE LOCALLY?
3A1	16	N/A	F5820-672-6313	COL	955	P[X] S[ ]	8	T	Y[X] N[ ]
						P[ ] S[ ]			Y[ ] N[ ]
						P[ ] S[ ]			Y[ ] N[ ]
						P[ ] S[ ]			Y[ ] N[ ]
						P[ ] S[ ]			Y[ ] N[ ]

23. REPAIR TIME FACTORS

CODE	DAYS	HOURS	TENTHS	CODE	DAYS	HOURS	TENTHS

24. REMARKS (CONTINUE ON REVERSE SIDE IF NECESSARY)

SRA-1

15.2

Figure 4-3.—Electronic equipment failure/replacement report, DD-787.

which resulted from earlier (obsolete) requirements of listing only a single part on a single card. This new form, combined with the Operational Time Log, NavShips 4855, provides the necessary data for accurately showing: (1) mean-time-between failures, (2) mean-time-to-repair, (3) down-time, (4) availability, (5) failure rates, and (6) replacement (consumption) rates.

The report forms are packaged between manila tag covers and flaps, with 50 sets per package.

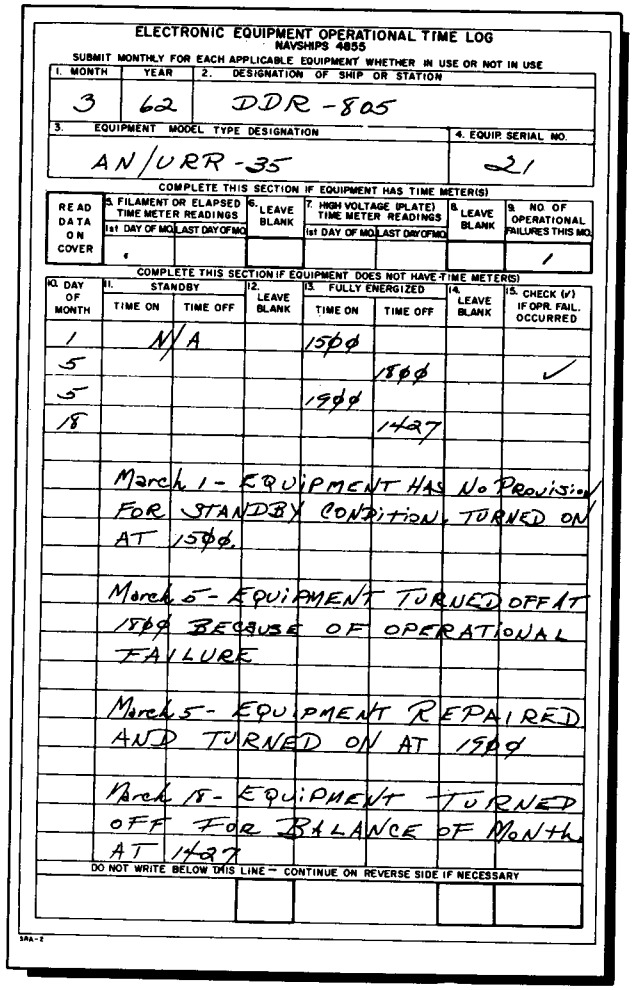
The covers and flaps have printed codes and instructions for accurately completing the entries on the new DD-787 form.

Electronic Equipment Operational Time Log, NavShips 4855

The electronic equipment operational time log (fig. 4-4) serves a twofold purpose. First, it is used to show accurate time-base data for figures-of-merit, which concern all failure-rate or replacement-rate calculations, or which concern other calculations that show reliability and maintainability factors. Second, it shows periods of actual operation versus inoperative periods; such period values are known technically as equipment population figures.

Without operational time or population figures that are reasonably accurate, any one or more figures of merit are not significant. Therefore, one realizes how the operational time log is essential in evaluating other reports, especially the previously described DD-787.

The operational time log form is relatively simple to complete, especially when an equipment is supplied with time meter(s). Only five or six entries need to be made on the first day of a month (depending upon the number of meters), and three more on the last day of the



ELECTRONIC EQUIPMENT OPERATIONAL TIME LOG
NAVSHIPS 4855

SUBMIT MONTHLY FOR EACH APPLICABLE EQUIPMENT WHETHER IN USE OR NOT IN USE

1. MONTH	YEAR	2. DESIGNATION OF SHIP OR STATION
3	62	DDR-805

3. EQUIPMENT MODEL TYPE DESIGNATION	4. EQUIP. SERIAL NO.
AN/URR-35	21

COMPLETE THIS SECTION IF EQUIPMENT HAS TIME METER(S)

READ DATA ON COVER	5. FILAMENT OR ELAPSED TIME METER READINGS 1st DAY OF MO.	LAST DAY OF MO.	6. LEAVE BLANK	7. HIGH VOLTAGE (PLATE) TIME METER READINGS 1st DAY OF MO.	LAST DAY OF MO.	8. LEAVE BLANK	9. NO. OF OPERATIONAL FAILURES THIS MO.
							1

COMPLETE THIS SECTION IF EQUIPMENT DOES NOT HAVE TIME METER(S)

10. DAY OF MONTH	11. STANDBY TIME ON	TIME OFF	12. LEAVE BLANK	13. FULLY ENERGIZED TIME ON	TIME OFF	14. LEAVE BLANK	15. CHECK (✓) IF OPR. FAIL. OCCURRED
1	N/A			1500			
5					1800		✓
5				1900			
18					1427		

March 1 - EQUIPMENT HAS NO PROVISION FOR STANDBY CONDITION, TURNED ON AT 1500.

March 5 - EQUIPMENT TURNED OFF AT 1800 BECAUSE OF OPERATIONAL FAILURE

March 5 - EQUIPMENT REPAIRED AND TURNED ON AT 1900

March 18 - EQUIPMENT TURNED OFF FOR BALANCE OF MONTH AT 1427

DO NOT WRITE BELOW THIS LINE — CONTINUE ON REVERSE SIDE IF NECESSARY

15.3

Figure 4-4.—Electronic equipment operational time log, NavShips 4855.

same month; a total of 8 or 9 block entries (on a single form) are to be completed per equipment per month.

Equipments without time meters require somewhat greater effort. The format for packaging and using these forms are explained in detail on the covers (similar to the DD-787).

Electronics Performance and Operational Report, NavShips 3878

The Bureau must keep tab on new (and converted) equipments to evaluate their usefulness. This is accomplished with the subject report, NavShips 3878, shown in figure 4-5.

It is not desired that reports be submitted on all equipments. Reports are to be submitted only on those equipments listed in the EIMB. Any listing in EIMB is changed periodically to delete certain equipments and add others. A report is NOT required if an existing equipment has not been in operation. When applicable, NavShips 3878 is submitted monthly to the Bureau of Ships.

The NavShips 3878 reports are essential to keeping the Bureau informed on equipment performance and operation. Because they provide firsthand information on equipment under actual operating conditions and report the maximum ranges obtained, they are extremely valuable in evaluating the electronics maintenance program, enforcing manufacturer's guarantees, evaluating installation adequacy, improving equipment operation and safety, and improving equipment design.

The NavShips 3878 report contains a place for general remarks on the back of the form not shown in figure 4-5. Indicated here is any pertinent information not included elsewhere on the form such as detailed information on any unusual difficulty encountered in operation; exceptional maintenance required; and suggestions for improvement in design, tests, and new applications. The forwarding of suggested improvements is not to be construed, however, as authority to modify the equipment in any way. Nor does the forwarding of this report eliminate the separate requirement for forwarding the Electronics Failure Report (DD 787). Detailed instructions for preparing and submitting NavShips 3878 are contained in BuShips Instruction 9670.20D.

EQUIPAGE STOCK CARD AND CUSTODY RECORD

Tools and portable test equipment are equipage for which custody signatures are required. They are listed on Equipage Stock Card and Custody Records (Nav. S. and A. form 306), which are signed by the operations officer when he receives them from the supply officer. The electronics material officer (EMO) signs the custody record cards when he receives the tools and test equipment from the operations officer. The EMO then becomes responsible for them. He, in turn, issues them to the ETs. A memo receipt for equipage is signed by each ET when he receives a piece of equipment from the EMO, and the ET, in turn, becomes responsible to the EMO for the equipage.

ELECTRONIC PERFORMANCE & OPERATIONAL REPORT
NAVSHIPS 3878 (Rev. 4-60) *Submit original only to Bureau - No forwarding letter required*

REPORT-BUSHIPS-0670-1

FROM: USS RANGER (CVA-61) (Ship name, type and hull no.) ☐ LANT ☐ FLEET ☒ PAC
TO: CHIEF, BUREAU OF SHIPS (CODE)

REPORT CLASSIFICATION: UNCLASSIFIED
DATE: 1 Sep 61
REPORTING PERIOD: FROM 1 Aug 61 TO 31 Aug 61
TYPE AND MODEL OF EQUIPMENT: AM-1365/URT Amplifier
SERIAL NUMBER: 383
FIELD CHANGES TO DATE: ACCOMPLISHED: None; NOT ACCOMPLISHED: None
HOURS DURING PERIOD OF THIS REPORT: OPERATED 180; NOT IN OPERATING CONDITION 564
PERFORMANCE FIGURE (PF) & TECHNICAL EVALUATION: ☐ OUT-STANDING ☐ GOOD ☐ SATISFACTORY ☒ UNSATISFACTORY
OPERATIONAL EVALUATION: ☐ OUT-STANDING ☐ GOOD ☐ SATISFACTORY ☒ UNSATISFACTORY

RADAR

PEAK POWER OUTPUT (PT) dbm		AVER. VSWR IN TRANSMISSION LINE		AVER. ECHO BOX RING TIME YDS		MIN. DISCERNIBLE SIGNAL (PHASE) dbm	
MAX. RANGE TARGETS DETECTED	MI	MI	MI	MAX. ALTITUDE AT RANGE DETECTED	MI	MI	MI
MAX. ALTITUDE TARGETS DETECTED	FT	FT	FT	RANGE AT MAX. ALTITUDE DETECTED	FT	FT	FT
TARGET CLASS. TYPE - DETAIL (SEE REVERSE)				TARGET CLASS. TYPE - DETAIL (SEE REVERSE)			
MAXIMUM RELIABLE RADAR RANGE MI				MINIMUM RELIABLE RADAR RANGE YDS			

SONAR

SOURCE LEVEL (LS) db//uBAR	RECEIVING SENSITIVITY db//VOLT/uBAR		SEA STATE		PROCEDURE USED	
NOISE LEVEL db//VOLT	5 KNOTS	10 KNOTS	15 KNOTS	20 KNOTS	25 KNOTS	30 KNOTS
MAXIMUM RANGE SONAR TARGETS DETECTED AND TRACKED	RANGING YDS		LISTENING YDS		SOUNDING FATHOMS	
TARGET CLASSIFICATION TYPE AND DETAIL						
BT PATTERN						
OWN SHIP'S SPEED.	KTS		KTS		KTS	

COMMUNICATIONS

PERCENT OF TIME OUT OF CONTACT WHILE WITHIN RANGE (IF ANY)	ANTENNA SYSTEMS	INTERFERENCE (Frequencies, intensity, and sources)
0 %	No problems	No problems

POWER OUTPUT	AVERAGE VSWR	REL RANGE	RECEIVER SENSITIVITY
Voice 100 WATTS	1.5:1	40 miles	NA UVOLTS

ELECTRONIC WARFARE

MAXIMUM RANGE AND ALTITUDE TARGETS ALTI DETECTED	MI	FT	MI	FT	MI	FT
TARGET CLASSIFICATION TYPE AND DETAIL (SEE REVERSE SIDE)						
MAXIMUM RELIABLE RANGE AND ALTITUDE	MI	FT	MI	FT	MI	FT
TARGET CLASSIFICATION TYPE AND DETAIL (SEE REVERSE SIDE)						

MAX. RANGE SONAR TARGETS DETECTED	BT PATTERN	MAX. RELIABLE SONAR RANGE	BT PATTERN
YDS		YDS	

35.83

Figure 4-5.—Electronics performance and operational report, NavShips 3878.

All equipage is inventoried once a year. The inventory is completed within the first quarter of the fiscal year and within thirty days after the date it is started. The Equipage Stock Card and Custody Record (not to be confused with Ship Electronics Installation Record, NavShips 4110) is used in making the inventory. The ETs may be called upon to assist the EMO in making this inventory, which consists of checking to make sure that the items listed on the Custory Record are in the department.

SHIP ELECTRONICS INSTALLATION RECORD, NAVSHIPS 4110

The Ship Electronics Installation Record, NavShips 4110, furnishes an up-to-date inventory of all electronic equipment aboard each ship to interested fleet and shore activities. For reporting purposes on the NavShips 4110 form, the ship's electronic equipment is divided into 7 major categories as follows: (1) communications, radio navigation, and countermeasures equipment; (2) radar and radar identification equipment; (3) sonar and sonar identification equipment; (4) test equipment; (5) formerly fire control electronic equipment, now deleted; (6) nancy and radiac equipment; (7) intercommunication equipment; and (8) power supply equipment.

Instructions for preparing, revising, and submitting NavShips 4110 are contained in NavShips 900-135 (revised).

MISCELLANEOUS RECORDS

Other records that concern the ET include a ship's plan index, rough work logs, division training records, stock control records, and maintenance and repair records. These records are discussed in the training courses for the higher ET rates.