NAVAL SHIP SYSTEMS COMMAND SYMPOSIUM ON TECHNICAL DATA MANAGEMENT

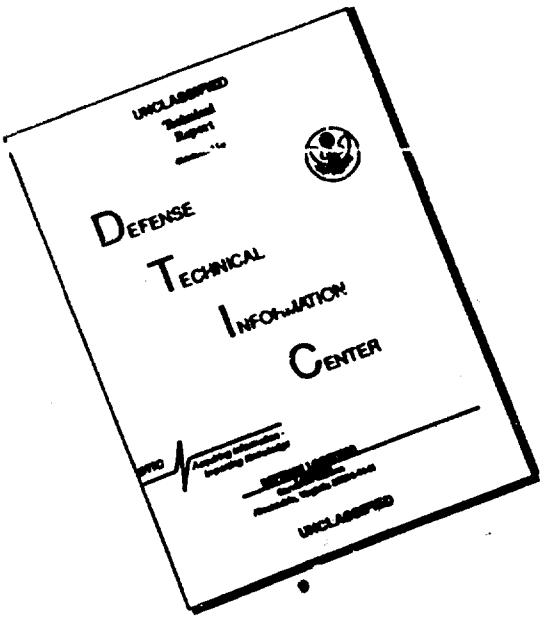
SEPTEMBER 12 - 14, 1967

GSA AUDITORIUM AT 18TH AND F STREETS
N. W., WASHINGTON, D. C.

REPAIR PARTS ASSEMBLIES ACQUISITION

ENCL. (1) TO NAVSHIPS LTR SER 2052-T1

DISCLAIMER NOTICE



THIS DOCUMENT IS BEST QUALITY AVAILABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

BLANK PAGE

PREPARED BY

ROBERT M. LERNER

NAVAL SHIP ENGINEERING CENTER

GREAT LAKES DIVISION

GREAT LAKES, ILLINOIS

REPAIR PARTS/ASSEMBLIES ACQUISITION

Acquisition of components and assemblies to provide logistic support for electronic equipment requires many different forms of documentation. The diverse data requirements of the Naval Ship Engineering Center, Great Lakes Division, are provided by information from the Naval Ship Systems Command, the Navy Electronics Supply Office and the contractor for Naval Ship Engineering Center Electronic Equipment.

Naval Ship Engineering Center, Great Lakes Division, performs the following tasks with technical data forming the basic tools. It provides technical representation for Naval Ship Engineering Center in the provisioning of electronic equipment; it provides engineering services to the Navy Electronics Supply Office; it performs acquisition monitoring and analysis of Naval Ship Engineering Center electronics equipment procurements to assure the availability of repair parts and electronic assemblies from the initial installation to deletion of such equipment from the Navy: from the cradle to the grave.

In fulfilling the primal purpose of the Great Lakes Division: that is, the providing of engineering support to the Navy Electronics Supply Office; a contract monitor system is being developed to provide

reports of potential and actual problems in the cycle of procuring repair parts and assemblies.

The data for the Great Lakes Division tasks and the Contract Monitoring System, which are required from other Navy Agencies and offices, include information and documentation such as procurement requests, invitation for bids, request for proposals, contracts, contract modifications, milestone schedules, specifications, type of support, maintenance philosophy, installation data (hull or site and date), and contract status reports.

The data required of a contractor for electronics equipment provide many of the basic "tools" utilized by the provisioning engineer, the procurement engineer and the acquisition engineer. A parochial view of the data required will be taken, and data elements for inclusion on the Contract Data Requirements List, DD Form 1423 (1 September 65) will be discussed individually.

Provisioning technical documentation must be specified in accordance with MIL-E-17362D (SHIPS) of 14 May 1962 and MIL-E-17362D Amendment 2 of 10 June 1963. MIL-E-17362D (SHIPS) is entitled Electronic Repair Parts, Procedures for Provisioning Technical Documentation and Stock Numbering. Exhibit 1, attached to this paper, should be

specified for documentation reflecting modifications and design changes. The Navy Initial Support Requirements (NISR-1) and the Provisioning Requirements Statement (PRS) documentation are being developed and probably will, at some future date, replace MIL-E-17362D. Although MIL-E-17362D may be superseded, the basic data requirements will be discussed here in the terminology of this specification.

The electronics assemblies list of MIL-E-17362D is required for equipment which is designed to utilize replaceable electronic assemblies. The assemblies list should be arranged in reference symbol number sequence. These data are used as a guide in the decision as to whether an electronic assembly is repairable aboard ship. This decision indirectly influences test equipment, technician training, budgeting of funds, repair facilities and Source, Maintenance and Recoverability (SM&R) coding.

A long lead time repair parts list(s), as required by MIL E-17362D, must be submitted in reference symbol number sequence in a timely manner, for utilization in provisioning items that have long procurement cycles.

The provisioning list(s) must be prepared in reference symbol number

sequence. The provisioning list submitted should include 80-column electronic accounting machine (EAM) cards. The data from the electronic assemblies list and long lead repair parts list must be correlated with the provisioning list. The provisioning list must be congruent with the technical manual parts list. If it has been determined that the provisioning list will not be available in time for the Navy Electronics Supply Office to provision the equipment in a timely manner for support at installation, Equipment Repair Parts, Type 3, should be specified in the contract. Equipment delivery on a contract must allow at least a year for proper provisioning.

The remaining provisioning technical documentation shall be submitted in accordance with MIL-E-17362D and Amendment 2. But, it is recommended that MIL-E-17362D be revised to permit and define a Certificate of Two-Way Interchangeability. The Certificate of Two-Way Interchangeability is to be submitted by a contractor on an identical equipment for which documentation exists from a previous contractor. Two-way interchangeability is defined to mean that one contractor's part may be replaced with another's and vice versa.

The electronic assembly data specified in section 3. 3. 2. 1 of MIL-E-16400F (NAVY) dated 24 Feburary 1966 and MIL-E-16400F (NAVY) Amendment 2 dated 30 March 1967, must be required in

the DD Form 1423 for all equipment employing replaceable electronic assemblies. MIL-E-16400F is entitled Electronic Equipment Naval Ship and Shore: General Specification.

The information required by the assembly data specification in MIL-E-16400F includes electronic parameters of the unit, data for electrical and physical identification, test jigs, test equipment setups, data sheets for each nonstandard electronic part, cost and the mean time between failure (MTBF). The assembly data is used in making the aforementioned decision on whether a replaceable electronic assembly is repairable aboard ship. The data provide a foundation for budget requirements; Source, Maintenance and Recoverability coding; range and depth of support.

The data of MIL-E-16400F provide electronic, electrical and physical parameters to aid in the reprocurement of identical assemblies and form a foundation for the procurement drawings to be discussed later.

A line item in the DD Form 1423 should specify a requirement for the contractor's Reliability Test Plan in accordance with MIL-R-22732 (SHIPS), Reliability Requirements for Shipboard and Ground Electronic Equipment. The requirements of this document provide the mean time

between failure data required for provisioning decisions.

Documentation for nonstandard electronic parts must be required in the DD Form 1423 in accordance with the latest revision of MIL-STD-749. MIL-STD-749 is entitled Preparation and Submission of Data for Approval of Nonstandard Electronic Parts.

MIL-D-1000 and MIL-D-1000/2 are entitled Drawings, Engineering and Associated Lists. For the acquisition of engineering drawings, the specification in the DD Form 1423 must be in accordance with MIL-D-1000/2 (SHIPS) dated 14 October 1966. Category E (Procurement Identical Items), Form 1, Type II are preferred. Category F (Procurement Interchangeable Items) is acceptable only under the conditions of sections 3.2.5.2 and 3.2.5.3 of MIL-D-1000 dated 1 March 1965.

Although MIL-D-1000/2 (SHIPS) section 3.3 specifies Form 2 drawings, Form 1 drawings are desired and attempts to procure such should be considered unless the criteria of section 6.1.2.2 of MIL-D-1000 prevail. Form 2 drawings do not control the engineering formats (drawings sizes) or the dimensioning practices in accordance with MIL-STD-8, Dimensioning and Tolerancing, which are important for standardization and interpretation. For this reason, Form 1 is preferred.

Since the quality control data inspection, test and evaluation requirements, stated in MIL-D-1000 Categories E and F, are nebulous, improvement is recommended by adding the following (or a reference thereto) to the "remarks" block number 16 of the DD Form 1423:

> "The quality control data, inspection, test and evaluation requirements and criteria shall be described in sufficient detail to enable complete examination of the product to the high degree of quality required by the government necessary to obtain an adequate identical or interchangeable substitute. Examinations and test procedures including specific characteristics and parameters shall be delineated to the degree necessary to assure compliance with the physical, mechanical, electrical and operational requirements of the contract. This data shall also include environmental, life, interchangeability and reliability requirements, as necessary and applicable to meet the requirements of the category stipulated. All test limits and tolerances including acceptance and rejection criteria shall be included."

To assure the acquisition of engineering drawings in complete conformance with MIL-D-1000/2 (SHIPS), the contractor's quality control check list, required by paragraph 4.1.2, should be furnished with the delivery of each set of drawings to the procuring activity. This requirement should be stipulated on the DD Form 1423.

Engineering drawings should be procured as Aperture Cards Code A of MIL-STD-804B of 15 August 1966, in accordance with MIL-M-38761 of 15 August 1967 and MIL-M-9868/1 (SHIPS) of 14 October 1966. This requirement must be specified in the DD Form 1423. MIL-STD-804B is entitled Formats and Coding of Aperture, Copy and Tabulation Cards for Engineering Data Micro-Reproduction System; MIL-M-38761 is entitled Microfilming and Photographing of Engineering Technical Data and Related Documents: PCAM Card Preparation, Engineering Data Micro-Reproduction System, General Requirements for, Preparation of; and MIL-M-9868/1 (SHIPS) is entitled Microfilming of Engineering Documents, 35MM for Naval Ship Systems.

The requirement for aperture cards of Category E(F) drawings enables revisions and updated drawings to be inserted in a procurement data package easily and assures that the data package is current in view of the latest drawings. Purchasing and providing aperture

cards to the Navy Electronics Supply Office (ESO) instead of microfilm will save the effort necessary to prepare the aperture cards.

The Navy Electronics Supply Office (ESO) maintains a drawing library which includes electronic repair parts and assemblies peculiar to Naval Ship Systems Command electronic equipments. The drawing library utilizes aperture cards and has at present approximately 2.5 million active drawings. In July 1967, approximately 16,000 drawings (on aperture cards) were introduced into the library. ESO manages 156,257 federal stock numbered repair parts and assemblies of which 103,130 are NAVSHIPS/NAVELEX (as of March 1967).

Earlier it was recommended that during the provisioning process the MIL-D-1000/2, Category E, Form 1, Type II drawings be utilized. These drawings should be available during provisioning. One set of the aperture cards will be placed in the Navy Electronics Supply Office Library, and other sets will be used as working copy. This library is the one used to procure repair parts and assemblies for the Navy Supply System. Any inadequacies in the documentation in this library will result in equipment problems.

Naval Ship Engineering Center, Great Lakes Division, is tasked to support code Contractor Furnished and Locally Procured Equipment. The data required to enable support coding of vendor equipment are existing population; identification of function and related mission essentiality; repairability of equipment and shipboard repair facilities; and the economics of levels of repair (shipboard, depot, or vendor). The General Specification for Ships, Section 9310-1, Repair Parts, excludes provisioning technical documentation for electronic equipment, components, and systems which are listed in ESO Publication #9, Index of APL's. It is recommended that provisioning documentation as specified in Exhibit 1 attached to this paper, MIL-E-17362D, and MIL-E-17362D Amendment 2 be required in all procurements, and that the General Specification for Ships be so amended. For identical equipment a Certificate of Prior Submittal would then be authorized and changes documented. In the case where ESO Publication #9 indicates the equipment is not to be supported, no provisioning technical documentation will be purchased.

In summary the Naval Ship Engineering Center, Great Lakes Division (NAVSEC GLAKESDIV), requires data for engineering support during the provisioning cycle and for follow-on procurement to provide repair parts and assemblies for the supply system to support the Naval Ship Systems Command electronic equipment in the fleet.

The data provided by the specifications discussed would be supported on a stronger foundation by implementing the recommendations for:

1. Availability of 80 column EAM cards at provisioning.

2 Use of Exhibit 1 (attached to this paper) for design change or equipment modification.

3. Delivery of drawings on aperture cards.

4. Acceptance of Certificates of Two-Way Interchangeability.

5. A requirement for provisioning technical documentation for all Contractor Furnished Equipment which requires support.

BLANK PAGE

EXHIBIT 1

PROVISIONING TECHNICAL DOCUMENTATION (PTD) REQUIREMENTS FOR EQUIPMENT MODIFICATIONS/CHANGES

1 May 1967

Ref: (a) MIL-E-17362D and Amendment No. 2 of 10 Jun 1963
(b) MIL-STD-100 of 1 Mar 1965

These requirements are applicable on all contracts and/or orders for the development and/or production of engineering or design changes (including field changes). These requirements supplement the requirements of reference (a). Paragraphs listed as "applicable" refer to the corresponding paragraphs of reference (a).

Correspondence concerning these requirements should be addressed as follows:

Commanding Officer
Navy Electronics Supply Office
Great Lakes, Illinois 60088

Attention: Code 14

1. Engineering and Design Change Provisioning Technical Documentation (PTD) Requirements

a. Whenever a government approved engineering or design change, changes, deletes or adds an item that normally would be listed in a Provisioning Parts Breakdown (PPB), (Method A Provisioning List, as specified in paragraph 3.6.1 of reference (a)), the contractor shall submit a PPB to reflect the changes. A long lead time repair parts list and/or electronics assembly list as specified in paragraph 3.6.1 is to

be submitted, if required. The PPB is to be submitted in accordance with the requirements of reference (a) except the PPB is to contain only parts affected that are not physically and electronically interchangeable and/or will deter from optimum performance of the unit or equipment. Changes in Reference Symbol Numbers are to be considered as included in the requirements for listing an item in the PPB. A separate entry must appear in the PPB for each Reference Symbol Number affected by the change. All other requirements of reference (a) are applicable except as follows:

(1) The PPB must contain all assemblies/units and parts as defined in reference (a) (deleted and/or added by the change).

(a) Parts for assemblies deleted for the change shall be listed and identified as deletions.

(b) Parts for assemblies added by the change shall be listed and identified as additions.

(c) An assembly modified by the change shall be identified as a "deletion" listing the previous part number, and an "addition" listing the changed part number (the requirement for "changes" requiring new identifications are specified in paragraph 1-402.12 of reference (b)). Only parts deleted and/or added to modify the assembly are to be listed.

(d) Higher order assemblies above the assembly affected by the changes must be listed up to and including the next higher assembly

above the highest order assembly logically supported as a spare assembly.

(2) Other requirements of paragraph 20.5 of reference (a) for the PPB are applicable, except as follows:

Contract Control Number - All contract control numbers will be assigned by the Electronics Supply Office as required. Initial contract control numbers will be furnished to the contractor with the establishment of the Provisioning Performance Schedule.

Block 1: Item or Sequence Numbers - Applicable, except modifications are to be treated as deletions and additions. (I.e., the previous item is to be listed as a deletion and the new item as an addition.) In the event a PPB is to be submitted for an engineering or design change or revision pages are to be submitted for a PPB prepared in other than Reference Symbol Number sequence, the PPB shall be sequenced in Reference Symbol Number order and Item Sequence Numbers assigned accordingly. The fifth and sixth digits are to indicate additions and deletions in terms of the PPB being submitted. A preface must be provided for the PPB and is to include a statement that Sequence Numbers assigned to the items in the PPB are not the same as the Sequence Numbers previously assigned to the items.

Whenever items to be added between two previously assigned Item Sequence Numbers exceed 33, the items are to be sequenced above the highest Item Sequence Number and a single entry inserted to indicate

(in the remarks field) the block of Item Sequence Numbers assigned . Subsequent additions shall be sequenced with the new block of sequence numbers.

The basic Item Sequence Number must be the same for the same Reference Symbol Number (e. g. , a part changed as the result of a field change shall appear as A004 D, Reference Symbol 1 A1 R1 with the previous part number indicated; and as A004A3, Reference Symbol 1 A1 R1, with the new part number indicated.)

Block 3: Reference Symbol Number - Applicable, except nonelectronic parts not otherwise identified shall be assigned a pseudo circuit designation "MP" followed by a number. The assignment of Reference Symbols shall not disagree with identifications in the equipment maintenance manual.

Block 6: Quantity per Assembly - Applicable, except for changes, this block indicates the quantity deleted or added as designated in the Item Sequence Number (Block 1).

Block 8: Quantity per End Item/Article - Applicable, except deletions and additions are summarized separately. The "first appearance" of an item deleted from the end item/article is to indicate the total quantity of uses of the Manufacturer's Part Number (Block 17) deleted in the PPB (i.e., The total of Block 6 for every item deleted with the same Manufacturer's Part Number (Block 17)). The "first appearance" of an item added to the end item/article is to indicate the

total quantity of uses of the Manufacturer's Part Number (block 17) added in the PPB.

Block 11: Unit Price - Applicable, except the price is not required for deleted items.

Block 14: Federal Stock Number - Applicable for deletions and additions.

Block 20: Useable On Code - Applicable, thePPB preparing activity shall assign codes if required and identify the codes in a Preface to be submitted with the PPB.

(3) In addition to the requirements to reference (a) an "alphanumeric" summary listing of all "first appearance" items listed in the PPB (additions and deletions) shall be provided as the last section of the PPB. The listing shall contain the data included in Blocks 17, 16, 5, 4, 1, 8 and 20 for the "first appearance" (only) of each item. (Manufacturer's Part Number (block 17)). Column headings are to be printed on each page.

(4) Whenever it is necessary to change data previously provided in accordance with these requirements, to correct errors and/or reflect changes made in the engineering or design change (including field changes) prior to delivery, the contractor shall submit a PPB consisting of items changed, added and/or deleted only. The PPB is to be submitted in accordance with the other requirements of this specification, except as follows:

(a) Paragraph 20. 5 of reference (a) - Applicable as modified above except as follows:

Block 1: Item or Sequence Number - The requirements of this specification are applicable except changes are to appear as "deletions" reflecting data originally provided, and as "additions" reflecting the "changed"data. The basic Item Sequence Number must be the same for the item, before and after the change. In the event the "Reference Symbol Number" is changed, the items are to appear based on the 'Reference Symbol Number" originally assigned to the item.

2. Documentation furnished as required by this specification is not to be construed as satisfying documentation requirements required under other items in the schedule of the contract or order.