DOD-STD-1768 (USAF)
14 December 1981

DOD STANDARD

PROCEDURES FOR DEVELOPMENT
OF
DEPOT TECHNICAL DATA

AMSC F 3175

MISC

DOD-STD-1768 (USAF)
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DEPARTMENT OF THE AIR FORCE
BALLISTIC MISSILE OFFICE
Air Force Systems Command

Procedures for Development of Depot Technical Data

DOD-STD-1768(USAF)

1.   This Military Standard is approved for use by the Ballistic Missile Office (AFSC), Department of the Air Force, and is available for use by all Departments and Agencies of the Department of Defense.

2.   Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to BMO/AWD, Norton AFB, CA 92409, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document, or by letter.

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FOREWORD

This standard prescribes the procedures for development and control of depot technical data for use by qualified technicians during depot level overhaul and repair of specified aerospace vehicle equipment (AVE) and support equipment (SE).

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Appendix

1. SCOPE

1.1 <u>Purpose.</u> This standard defines the functions and procedures for the development of Depot Technical Data (control manuals, engineering data, and other technical orders) for use in depot level overhaul and repair of aerospace vehicle equipment (AVE) and support equipment (SE). It requires the identification of all equipment items, to the lowest reparable unit, for which a depot level maintenance program is identified and defined during the logistics support analysis (LSA) outlined in SAMSO STD 77-6.

1.2 <u>Application.</u> This standard applies to agencies, commands, organizations, and contractors engaged in the development of equipment items which require depot level overhaul/repair.

2. REFERENCED DOCUMENTS

2.1 <u>Issues of documents.</u> The following documents of the issue in effect on date of invitation for bids or request for proposals form a part of this standard to the extent specified herein.

SPECIFICATIONS

MIL-M-38784	Manuals, Technical: General Style and Format Requirements
MIL-M-7298	Manuals, Technical: Commercial Equipment

STANDARDS

MIL-STD-1574	System Safety Program for Space and Missile System
SAMSO-STD 68-57A	Procedures for Quality Assurance and Configuration Control of M-X Weapons System Technical Publications
SAMSO STD 77-6	System Requirements Analysis Program for the M-X Weapon System
SAMSO STD 79-1	Integrated System Safety Program for the M-X Weapon System

OTHER PUBLICATIONS

AFLCR 66-17	Depot Maintenance Support Planning
AFR 127-12	Air Force Occupational Safety and Health Program
TO 00-5-1	Air Force Technical Order System

| TO 00-5-2 | Technical Order Distribution System |
| TO 00-20-1 | Preventive Maintenance Program, General Requirements and Procedures |

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Conflict between documents. In case of conflict between this standard and referenced applicable documents, this standard shall take precedence.

3. DEFINITIONS. For purposes of this standard, the following definitions apply.

3.1 Acronyms. The following acronyms are used in this document:

A&CO TA	assembly and checkout technical analysis
AECO	advanced engineering change order
AFLC	Air Force Logistics Command
AFOSH	Air Force Occupational Safety and Health
AFSC	Air Force Systems Command
AFTEC	Air Force Test and Evaluation Center
ALC	Air Logistics Center
AVE	aerospace vehicle equipment
BMO	Ballistic Missile Office
CDRL	contract data requirements list
CI	configuration item
DDSL	depot data status list
DID	data item description
DSE	depot support equipment
DSIWG	Development/Support/Interface Working Group
DTDVCR	Depot Technical Data Verification Completion Record
DTDVR	Depot Technical Data Verification Recommendation
ECP/ECN	engineering change proposal/engineering change notice
EO	engineering order
FSE	factory support equipment
HCI	hardness critical item
LSA	logistics support analysis
LSAR	logistics support analysis record
MSE	maintenance support equipment
MPL	maintenance parts list
OSE	operational support equipment
SE	support equipment
SRA	system requirements analysis
TCTO	time compliance technical order
TO	technical order
TOMA	Technical Order Management Agency
TPA	test planning analysis
TRC	technology repair center

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3.2 <u>Control manual.</u> A technical order (TO) prepared in accordance with this standard and MIL-M-38784A and incorporating support data, by reference. A control manual identifies all depot overhaul tasks recorded in a preferred sequence, support equipment (special tools and test equipment), a list of support data required to accomplish each task, and provides a means of determining the configuration of support data.

3.3 <u>Control manual outline.</u> An outline is a method of organizing material and content of a control manual into a logical, sequential manner by volume, section, chapter and paragraph breakdown prior to finalization into a written/printed document.

3.4 <u>Depot support equipment (DSE).</u> That class of equipment, excluding common hand tools, necessary to overhaul or repair and test contractor hardware to the lowest reparable unit. This includes commercial equipment, as well as equipment specifically designed or built to fulfill a particular depot overhaul or repair function.

3.5 <u>Depot technical data.</u> Documentation (control manuals, engineering data, other TOs, etc.) for use by technicians during depot level maintenance functions on AVE and SE.

3.6 <u>Development/Support/Interface Working Group (DSIWG).</u> A working group established by the Technical Order Management Agency (TOMA) to plan, schedule, and coordinate technical publications/data development and acquisition. The DSIWG will establish operating procedures, develop and monitor technical publication program schedules, continuously monitor program events and requirements, and assure that technical publications/data are scheduled and available to support various program events.

3.7 <u>In-process reviews.</u> Defined in TO 00-5-1.

3.8 <u>Overhaul.</u> Defined in TO 00-20-1.

3.9 <u>Prepublication reviews.</u> Defined in TO 00-5-1.

3.10 <u>Repair.</u> Defined in TO 00-20-1.

3.11 <u>Source data.</u> Documentation developed by a contractor to support equipment items developed by that contractor. Source data may stand alone or may be incorporated into other documentation when the hardware is integrated into, attached, or otherwise becomes a part of other equipment.

3.12 <u>Support data.</u>

3.12.1 <u>Engineering data.</u> Data prepared by a contractor to support hardware developed and produced by the contractor. This data includes current engineering drawings, schematics, wiring diagrams and lists, logic diagrams, process specifications, test specifications, manufacturing and test instructions, vendor developed

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drawings and procedures, acceptance procedures, etc. These data are in the form of existing data (developed to support other contractor requirements).

3.12.2 **Technical orders (supplemental data).** Data prepared by a contractor when it has been determined there is no existing data, or existing data is determined to be inadequate (ref. 5.1.5.2). Such data contains a title page, list of effective pages, and a table of contents.

3.12.3 **Commercial manuals.** Manuals applicable to equipment designed and manufactured to commercial specifications, rather than military specifications, and used to support military equipment, systems, and facilities.

3.13 **Support equipment (SE).** Defined in TO 00-20-1.

3.14 **Technical order.** Defined in TO 00-5-1.

3.15 **Technical Order Management Agency (TOMA).** Defined in TO 00-5-1.

3.16 **Test station.** A facility at a technology repair center (TRC) or other depot maintenance location specially designed to test or calibrate a depot reparable.

3.17 **Validation.** Defined in TO 00-5-1.

3.18 **Verification.** Defined in TO 00-5-1.

4. GENERAL REQUIREMENTS

4.1 **Integrated data concept.** The contractor shall prepare documentation, as defined in 3.5, using an integrated data concept under which documentation required to support a function/task common to more than one application will be developed only one time. During the design of factory support equipment (FSE) and software, the contractor will determine requirements for DSE. Operation and maintenance data for FSE that is identified for transition to DSE will be developed by the contractor to enable its use as depot technical data.

4.1.1 **Use of other TOs.** Existing TOs common to organizational or intermediate and depot level tasks shall be referenced with TOMA approval. If other TOs do not exist, the contractor shall develop depot technical data, as defined in 3.2 and 3.12, to provide the required support.

4.1.2 **Exchange of source data.** Contractors shall exchange source data (see 3.11) when one contractor's configuration item(s) (CI(s)) interfaces with or is integrated into a CI developed by another contractor. The contractor responsible for the integrated data shall identify to the contributing contractor (the contractor responsible for providing the source data) the specific type and format and required submittal dates of the data required for the integration. Exchange of source data shall be through technical interchange meetings or other mutually agreed means.

Problems involving exchange of source data shall be identified to the TOMA for resolution.

4.2 **Structuring.** Control manuals will be structured and packaged to support the Air Force Logistics Command (AFLC) TRC concept as defined in AFLCR 66-17. However, to the extent possible, the contractor shall assure flexibility in structuring to allow possible relocation of TRC responsibility assignment among air logistics centers (ALCs), contractor depot maintenance, or other designated depot maintenance facilities in the event a reparable is transitioned. Structuring shall be reviewed and approved by the TOMA prior to or in conjunction with control manual outline approval.

4.2.1 **Specialized packaging.** Aerospace vehicle equipment, maintenance support equipment and operational support equipment (AVE/MSE/OSE) control manuals will be packaged by major reparable items, such as inertial measurement unit, platform, gyro, accelerometer, computer, modules, etc. DSE control manuals will be packaged by test station complex/tasks. Repair stations with minimal SE requirements will be packaged in a single control manual.

4.3 **Documentation development.** The development of depot technical data is an iterative process, as illustrated in Figure 1. Interim products, as they evolve, shall be used by the contractor to further determine the detailed support documentation requirements.

4.3.1 **Interim products.** The contractor will use the information available in the LSA, provisioning data and related documentation for development of depot technical data (list of depot reparables, list of DSE, list of applicable TOs, and support data).

4.3.2 **System requirements analysis (SRA) documentation.** The contractor will use the functional flow diagrams, supporting Forms B, LSA record (LSAR) data sheets, and interim products as a baseline for development of the depot technical data. Depot technical data is directly related to the SRA and LSA as described in 4.7.1.

4.4 **Quality assurance and configuration accountability.** The contractor shall establish, implement, and maintain a TOMA-approved quality assurance and configuration accountability program for all depot technical data in accordance with SAMSO STD 68-57A.

4.5 **Safety.** Each test, operating, or maintenance procedure (prepared by the contractor) including computer-controlled test sequences will be reviewed by Ballistic Missile Office/System Safety Division (BMO/MNBS) or a designated representative. The review, which may be part of an in-process, verification or prepublication review, will be based on data available in the hazard control analysis outlined in SAMSO STD 79-1.

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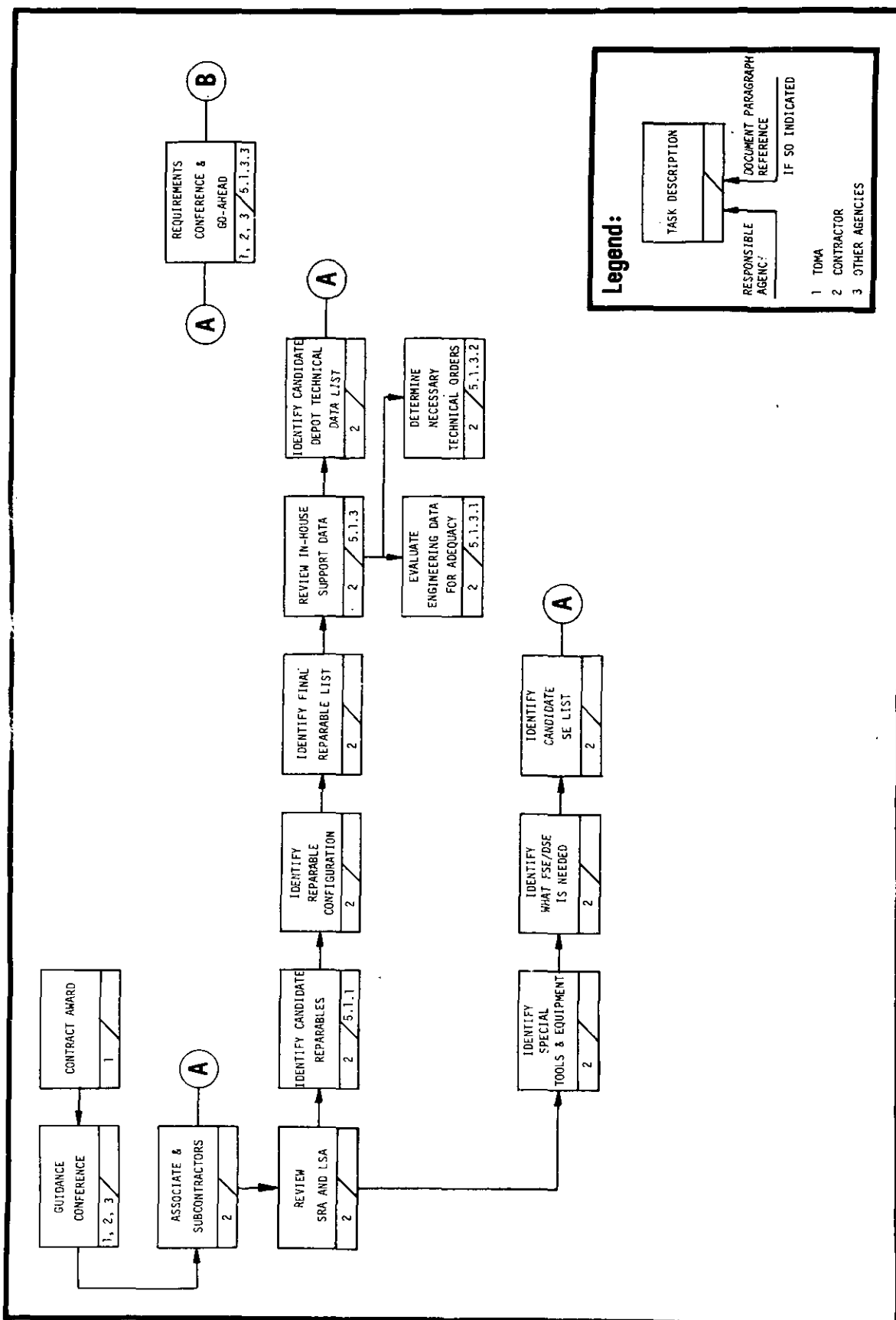
FIGURE 1. Depot Technical Data Development Process (Page 1 of 2)
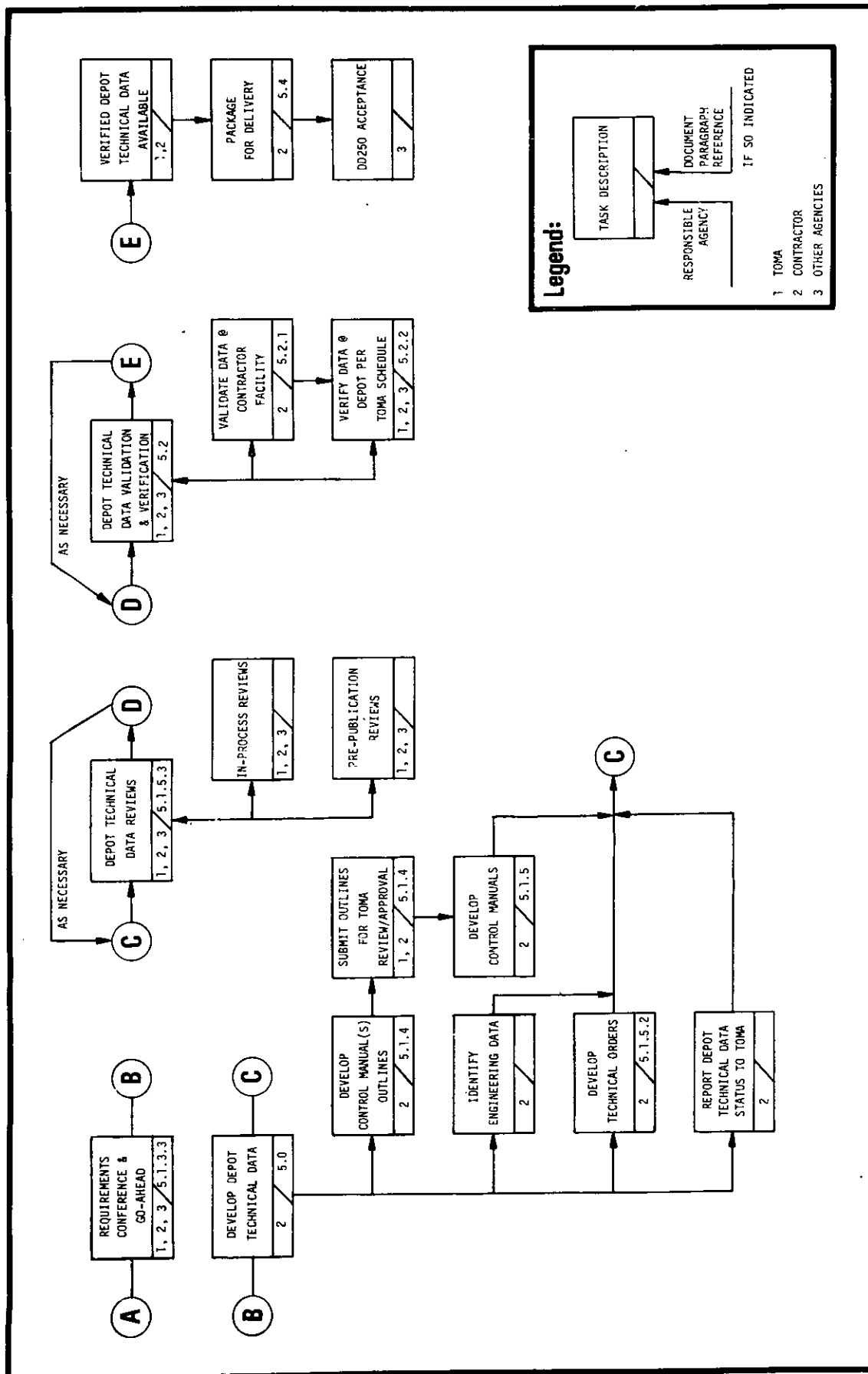
FIGURE 1. Depot Technical Data Development Process (Page 2 of 2)

4.5.1 <u>Safety critical procedures.</u> Test, operating, or maintenance procedures (prepared by the contractor) that involve or affect safety will be designated as safety critical procedures. Safety critical procedures will be approved by BMO/MNBS or a designated representative (as outlined in MIL-STD-1574A) during an in-process, verification, or prepublication review.

4.5.2 <u>Air Force Occupational Safety and Health (AFOSH) requirements.</u> Technical orders (supplemental data) will be reviewed to insure compatibility with Air Force Occupational Safety and Health requirements in accordance with SAMSO STD 79-1 and AFR 127-12.

4.6 <u>Development process.</u> Development of adequate and accurate depot technical data is a viable process during which all elements that impact the documentation are reviewed, analyzed, and evaluated. Although it is a progressive process, it will be necessary to revisit some steps as the effort continues.

4.6.1 <u>Interim products development.</u> Figure 1 illustrates the development, analysis, and evaluation of interim products required for determination of depot technical data requirements. The development process requires both independent and joint efforts of the TOMA, contractors, and other agencies. Most of the data required for development of the interim products is available directly from other contract requirements.

4.7 <u>Relationship of depot technical data to the SRA/LSA.</u>

4.7.1 <u>System requirements analysis.</u> The SRA comprises the operational analysis, the LSA, the test planning analysis (TPA), and the assembly and checkout technical analysis (A&CO TA). The SRA, defined in SAMSO STD 77-6, is a systematic approach to establishing and optimizing requirements for equipment, personnel, procedures, and facilities. It provides the baseline against which proposed system changes can be evaluated.

4.7.2 <u>Logistics support analysis.</u> The LSA defines the total resources (tools, SE, technical data, spares, personnel, etc.) required to maintain the weapon system in the operational mode. The logistics support requirements are initially identified via functional flow diagrams and attendant Forms B (system functional requirements analysis forms). The depot level maintenance requirements are identified in Functional Flow Diagram 18.8, Perform Depot Level Maintenance, and the supporting Forms B. The LSA is further documented on LSAR data sheets.

5. DETAILED REQUIREMENTS

5.1 <u>Control manuals.</u> The contractor shall develop a control manual, or a series of control manuals (as defined in 3.2), for those categories of equipment for which the contractor is responsible that have been determined to be reparable by the LSA per 5.1.1. Example categories are: electrical, mechanical, electronic, pneudralic, etc.

5.1.1 <u>Reparable parts list.</u> The contractor shall utilize the LSAR summaries (and selected LSAR Data Sheets, as required) to identify all equipment items for which depot level maintenance task allocations have been determined. Items so identified form the basis for the Depot Reparables List to be compiled in accordance with paragraph 50.1.6, Appendix A for each control manual.

5.1.2 <u>Depot support equipment.</u>

5.1.2.1 <u>Base data review.</u> Review LSAR data sheets and appropriate LSAR summaries to determine the DSE required for depot overhaul/repair of those items identified on the reparable parts list after completion of 5.1.1. DSE so identified will be included in the depot support matrix (paragraph 50.1.8, Appendix A).

5.1.2.2 <u>Special skills review.</u> Review the identified equipment list and determine the special skills that are considered necessary to set up and operate the equipment. Give special consideration to the following elements:

    a.   Detailed set-up procedures;

    b.   Complex wiring connections;

    c.   Potentially dangerous features;

    d.   Sensitivity of the equipment to environmental influences; and,

    e.   Other restraining influences.

5.1.2.3 <u>Information usage.</u> The DSE list identified in 5.1.2.1 will become part of the control manual when that manual is compiled in accordance with 5.1.5.

5.1.3 <u>Document identification.</u> Using the results of 5.1.1 and 5.1.2, identify the documentation that will be required to perform the depot maintenance of the items identified on the reparable parts list.

5.1.3.1 <u>Existing support data.</u> Review existing support data, as defined in 3.12.1 and 3.12.3 and determine which can be used, as is, to satisfy the depot maintenance requirements for the items identified on the reparable parts list. The contractor shall use MIL-M-7298 to evaluate commercial manuals. Usable documentation shall be incorporated by reference into the control manual.

5.1.3.1.1 <u>Calibration instructions.</u> Calibration instructions, when required, will be provided in contractor format to periodically certify SE at intervals established by the contractor or the Air Force supplied calibration measurement summary. Assure that calibration checkout and acceptance procedures provide a full-loop system of checks of the AVE/SE interconnected configuration when such checks are required. When required to support test station (see 3.16) operations, calibration instructions will be packaged as a technical order (supplemental data). When calibration instructions must be developed, organize the data as follows:

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    a. Calibration parameters
    b. Equipment required
    c. Preliminary notes
        (1) Safety
        (2) Clean rooms
        (3) Special requirements
    d. Detailed step-by-step calibration procedures.

5.1.3.1.2 Parts identification data. Parts identification data, including pertinent equipment configuration and parts interchangeability information, shall be depicted in existing contractor documentation. Do not include maintenance parts lists (MPLs) unless unusual problems might exist in the identification of parts, for procurement, through use of existing TOs or contractor documentation, and are specifically approved by the Air Force Systems Command (AFSC) and AFLC agencies.

5.1.3.2 Requirements conference(s). The TOMA will schedule and conduct depot technical data requirements conferences for the purpose of reviewing candidate depot technical data recommended by the contractor. The contractor shall participate in requirements conferences and shall assist in resolution of all comments and objections arising during the conferences. During the conferences, the contractor shall offer for consideration the identification of existing data proposed for incorporation, by reference, into the control manuals, and identification of proposed technical orders (supplemental data) to be developed under 5.1.5.2. Any number of conferences may be held until the TOMA is assured the required support data is adequately defined. The conferences will be scheduled in conjunction with, or as part of, DSIWG (see 3.6) meetings. After review of the candidate support documentation by the TOMA, the contractor will be authorized to develop control manual outlines as required by 5.1.4.

5.1.4 Control manual outlines. After review by the TOMA of the required support data, the contractor shall develop control manual outlines (as defined in 3.3). The outlines shall be prepared in accordance with the control manual format contained in Appendix A. As control manual outlines are developed, the TOMA will incrementally review the outlines and provide direction regarding outline deficiencies or change in structuring for TRC support. When outlines are finalized by the TOMA, the contractor will be authorized to complete the control manual(s) as required by 5.1.5 and defined in 3.2.

5.1.5 Control manual preparation. After outline review by the TOMA, the contractor shall prepare control manuals in accordance with Appendix A.

5.1.5.1 Support data. During preparation of control manuals, incorporate the applicable existing support data by reference into the control manual.

5.1.5.2 Technical orders (supplemental data). Prepare technical orders (supplemental data), as defined in 3.12.2, during preparation of control manuals, and incorporate that documentation by reference into the control manual. Such technical orders will

contain a title page, list of effective pages, and a table of contents in accordance with MIL-M-38784. The text of the data may be in contractor format.

5.1.5.3 Depot technical data reviews. The TOMA will maintain close liaison with the contractor during all phases of development. The TOMA will conduct in-process and prepublication reviews, in accordance with TO 00-5-1, to assure that final depot technical data provided to the user conforms to all established technical requirements.

5.1.6 Master cross-reference technical order. When directed by the TOMA, a master cross-reference technical order shall be prepared. The manual shall contain a list of all hardware items classified as depot reparables that have been approved for coverage under this standard. The applicable operation and maintenance control manual shall be cross-referenced against each hardware item.

5.2 Validation/verification of depot technical data.

5.2.1 Validation. The contractor shall validate the control manuals and all referenced support documentation in accordance with TO 00-5-1. Validation shall be performed at the contractor's facility, or another designated facility where adequate reparables and SE are available. Use only qualified technicians in accordance with the tasks specified in the supporting data, the reparable item(s) to which the data applies, and the SE identified in the data. Participation by the using agency is required and the contractor shall be responsible for ensuring validations are scheduled in a manner to allow the TOMA or its designated representative to witness the validation. The procuring agency or designated personnel will witness the validation on a noninterference basis. Nonsupport by such witnesses for scheduled validation shall not restrict contractor validation accomplishment.

5.2.1.1 Correction of deficiencies. The contractor shall correct deficiencies identified during validation prior to beginning of verification.

5.2.1.2 Validation certification. The contractor shall provide certification of validation, if requested by the TOMA, prior to verification.

5.2.2 Verification. Verification shall be accomplished in accordance with TO 00-5-1 by depot technicians normally assigned to the appropriate AFLC repair areas to demonstrate that depot technical data, reparables, and SE are compatible. Verification results shall be documented on a Depot Technical Data Verification Completion Record (DTDVCR), as shown in Figure 2.

5.2.2.1 Recommended verification list. The TOMA will prepare a Depot Technical Data Verification Recommendation (DTDVR) list at in-process reviews. See Figure 3 for a sample DTDVR. A DTDVR is subject to concurrence/modification by AFSC/AFTEC/AFLC.

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DEPOT TECHNICAL DATA VERIFICATION COMPLETION RECORD

SHEET _____ OF _____

CONTROL MANUAL _____	REFERENCE DOCUMENT _____	VERIFICATION DATE: LOCATION:
T.O. NO.: _____	DOC. NO.: _____	
T.O. TITLE: _____	DOC. TITLE: _____	VERIF. START: COMPL DATE:
T.O. BASIC DATE: _____	DOC. BASIC DATE: _____	VERIFICATION COMBINED V/V ☐
T.O. CHANGE NO.: _____	DOC. CHANGE NO.: _____	
T.O. CHANGE DATE: _____	DOC. CHANGE DATE: _____	TYPE OF DATA VERIFIED ☐ ENG. DATA DEPOT EFF.
CONTROL T.O. CONTRACTOR: _____	REF. DOCUMENT SOURCE: _____	SUPPLEMENTAL ☐ DATA

DATA MATRIX ELEMENTS		REF. DOC. ELEMENTS			AFLC SIGNATURE	PUBLICATION ENGINEER	DATE	REMARKS.
FLOW CHART NO.	FUNCTION NO.	PARA	FIG	TABLE				

VERIFICATION TEAM CHAIRPERSON _____ AFLC ACCEPTANCE _____

DATE _____

BMO Form 59

FIGURE 2. Sample Depot Technical Data Verification Completion Record

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DEPOT TECHNICAL DATA VERIFICATION RECOMMENDATION

FIGURE 3. Sample Depot Technical Data Verification Recommendation

BMO Form 58

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5.2.2.2 <u>Use of draft copies.</u> Verification may be accomplished from draft copies if necessary to accommodate schedules, availability of reparables, SE, etc.

5.2.2.3 <u>Verification schedules.</u> The contractor will support verification activities scheduled by the TOMA based on availability of required equipment, software, facilities, and qualified personnel. Schedules will be coordinated with the contractor and affected agencies. The TOMA will have prime responsibility for the verification.

5.2.2.4 <u>Correction of deficiencies.</u> The contractor will correct deficiencies that are discovered during verification prior to approval of the verification by the TOMA. If, during verification, existing support data is determined to be inadequate for depot use, the contractor shall prepare technical orders (supplemental data) in accordance with 5.1.5.2.

5.2.2.5 <u>Verification approval.</u> Approval of the verification will be in accordance with 5.2.2.

5.2.3 <u>Combined verification/validation.</u> Verification and validation may not be combined except when lack of equipment or critical time limitations have prevented prior validation. TOMA approval will be obtained for a combined verification/validation.

5.3 <u>Changes and revisions.</u> The contractor will prepare changes and revisions as dictated by changes in equipment or procedures. Control manuals and technical orders (supplemental data), as prepared to this standard, shall be changed or revised in accordance with TO 00-5-1.

5.4 <u>Preparation for delivery.</u> Packaging, packing, and marking for shipment of depot technical data shall be in accordance with MIL-M-38784A.

Custodian:
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Preparing Activity:
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APPENDIX A

DEPOT LEVEL OPERATIONS
AND
MAINTENANCE CONTROL MANUALS

10. SCOPE

10.1 Purpose. This appendix provides preparation instructions for depot level operations and maintenance control manuals.

10.2 Applicability. This appendix is a mandatory part of this standard and is applicable as shown in 1.2 of the basic standard.

20. REFERENCED DOCUMENTS. (Not Applicable)

30. DEFINITIONS. (Not Applicable)

40. GENERAL REQUIREMENTS

40.1 Content.

40.1.1 Type of data. Manuals shall reference only that data required by technicians trained in performing depot level tasks (overhaul/maintenance/repair) on AVE and SE.

40.1.2 Extent of coverage. Each manual shall include sufficient information to effect a complete overhaul and repair of the equipment item. Include consideration of all operations such as receiving, inspection, teardown, assembly, calibration and application of special tools, the hook-up and use of test equipment, performance of tests (including acceptance tests), special handling requirements, special safety requirements, etc.

40.2 Automation capability. Prepare control manuals with a capability for conversion to an automated TO system by using type face characters identified in MIL-M-38784A.

50. DETAILED REQUIREMENTS

50.1 Format. Comply with this standard. Include the following elements:

50.1.1 Title page. The title page shall comply with MIL-M-38784A.

50.1.2 List of effective pages. The list of effective pages ("A" page) shall comply with MIL-M-38784A.

50.1.3 List of data to be verified. The list and status of data to be verified ("b" page) shall be in accordance with Figure 4. The "b" page shall list all unverified data. Such unverified data shall be identified by the data matrix number, and the

					LIST OF DATA TO BE VERIFIED
THE PARAGRAPHS AND TABLES THAT REQUIRE VERIFICATION ARE LISTED BELOW					
DATA MATRIX NO.	REF. DOC. NO.	PARA	FIG	TABLE	UNVERIFIED AT TRC INDICATED AND/OR WITH EQUIPMENT CONFIGURATION NOTED
ALL OTHER APPROVED REQUIREMENTS HAVE BEEN ACCOMPLISHED					

FIGURE 4. Sample List of Data To Be Verified ("b" Page)

referenced document number. The procedural data of the referenced document shall be identified by paragraph, figure, or table. Unverified data shall be listed against specific TRC locations or against reparable item configurations. As verifications are completed, they will be deleted so that the "b" page will reflect the unverified data status of that control manual at any point in time.

50.1.4 <u>TO/equipment configuration status record ("c" page).</u> The "c" page shall be in accordance with Figure 5. Identify each revision and change to the TO/equipment configuration. Identify each approved engineering change proposal (ECP)/time compliance technical order (TCTO) against equipment associated with each revision /change.

50.1.5 <u>Table of contents.</u> The table of contents shall comply with MIL-M-38784A.

50.1.6 <u>Section I, Introduction.</u> Identify each of the following paragraphs by title and include, in the subparagraphs thereof, a brief and concise explanation of each.

    a. <u>Scope.</u>

    b. <u>Application.</u> Include a NOTE, indicating to the using technician that all referenced engineering data (3.12.1) in the Depot Support Matrix (Section III) are to be requisitioned from ALC Engineering Management Office in accordance with local procedures. Referenced technical orders (3.12.2) are to be requisitioned in accordance with TO 00-5-2.

    c. <u>Composition and use.</u> Explain the composition and use of each section of the manual.

    d. <u>Depot reparables list.</u> Identify depot reparables, to the highest reparable level, which are included in the manual. Subindentured items need not be listed. Use official part/equipment numbers and nomenclature. If a CI number has been assigned, enter the number in parentheses directly below the part/equipment number. The Depot Reparables List shall be in tabular form as shown in Table I. List entries in alphanumerical order by part/equipment number.

Table I. Depot Reparables List

Part/Equipment Number	Part/Equipment Nomenclature	Page Number

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TECHNICAL ORDER/EQUIPMENT CONFIGURATION STATUS RECORD		
ECPs AND TCTOs AFFECTING THIS TECHNICAL ORDER ARE LISTED BELOW		
ECP/TCTO NUMBER	INITIAL TOCN NUMBER	REMARKS
WS-XXX-A-MMA-B622 (TCTO-XXX-MGM-18-210)	6	Hybrid Explicit Multiplexer
WS-XXX-A-MMA-B623 (TCTO-XXX-MGM-118-216)	6	PBV/Stage III Jumper
WS-XXX-A-MMA-B507R1	9	Deletion of Plate Finish from Mod 5 Section
CCP-2120	17	Incorporate ILCS Modification
WS-XXX-A-MMA-1286 (TCTO-XXX-MGM-118-518)	21	Incorporate Thrust Termination Event to Diagnostic Data Package
WS-XXX-A-MMA-1840	22	Modify R/V for Combat Training Launch
WS-XXX-A-MMA-1296 (TCTO-XXX-MGM-1742)	25	Incorporate ERCS Battery Monitor

FIGURE 5. Sample "c" Page (Technical Order Versus Equipment Configuration Status Record)

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e. List of support equipment. Identify the DSE required to perform each function for each reparable item by CI number (if available), part number, model number, nomenclature, manufacturer, and National Stock Number (if available). Use the format of Table II. In the first column, list each DSE item numerically for referencing in the Depot Support Matrix of Section III. Specify the quantity of each item of special tools/test equipment, if needed. Air Force standard test equipment will be identified for use except when specifically designated test equipment is required. This listing of tools and test equipment shall take precedence over tools and test equipment listed in referenced documents.

Table II. List of Support Equipment

Item	Nomenclature	Part Number, Model Number and Manufacturer	National Stock Number	Configuration Item
1	Oscilloscope (2 each)	535A Tektronix	6625-00-799-7956	
2	Bridge, Impedance	250-DA Electro Scientific Industries	6625-00-534-7458	
3	Keyboard, Printer	1816-1 IBM	7440-00-458-3081	

50.1.7 Section II, Depot Functional Flow Charts. Include a Depot Functional Flow Chart, as shown in Figure 6, depicting depot level functions required to overhaul each item of equipment for which the manual is prepared. These functions should be derived from the LSA as identified in paragraph 4.7.2 of this standard.

50.1.7.1 Data matrix numbers. In the first column, assign data matrix numbers using a decimal system. Begin with the highest level indenture of a depot reparable item, identified by the first number, and progress to lower indentures designated by the second and succeeding digits. Reparables common to two or more CIs will be subsequently identified by the data matrix number first assigned to it.

50.1.7.2 Reparable parts number and nomenclature. List the reparable parts by part number and nomenclature beginning with the highest level indenture and progressing to the lowest. Identify the indenture level in the indenture column.

50.1.7.3 Functions. Consider the following functions for applicability. Identify other functions, if required or necessary.

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DEPOT FUNCTIONAL FLOW CHART

Data Matrix Number	Indenture	Reparable Part Number and Nomenclature	Function							
			Test	Repair	Checkout	Calibrate				
			a	b	c	d				
	1	CI 00XXXXX 25-2377 Cooler, Liquid, Guidance Section								
1.1	2	1790-1B (10-20677-4) Amplifier, Electronic Control ASK-15/F37U	x							
1.17	3	25-78898-1 Temperature Monitor Module	x	x	x					
1.2		Feedback Net...	x	x						
	3	2670-127 Feedback Network, Valve								
1.12	3	2670-130 Resistor Assembly	x	x						
1.13	3	2670-140 Output Assembly	x	x						
1.14	3	1670-201 Chopper Assembly, Pre-Amplifier	x	x	x					
1.5	3	1790-501 Inverter Assembly	x	x	x					
1.6	3	1790-603 Filter Assembly, Switch, Electro-Interference	x	x	·					

FIGURE 6. Sample Depot Functional Flow Chart

a. Inspect

b. Disassemble

c. Clean

d. Assemble

e. Test

f. Repair

g. Checkout

h. Calibrate

i. Service

j. Handle

k. Overhaul

l. Remove

m. Install

n. Adjust

o. Purge

p. Protect

q. Store

50.1.7.4 Function identifiers. Identify functional columns with lower case alpha designators sequentially in the order of performance. Place an "X" in the functional columns only if the function is applicable to the reparable part identified.

50.1.7.5 Depot support matrix relationship. Relate each part to the depot support matrix contained in Section III of the manual by entering in the appropriate column the data matrix number assigned on the depot support matrix.

50.1.8 Section III, depot support matrix. Identify the DSE and the support data (defined in 3.12) required to perform each function for each reparable item. Use the format of Figure 7. Abbreviations contained in Table III may be used in preparation of the depot support matrix. Other abbreviations may be used provided they are peculiar to the particular support data or equipment and are listed in a glossary within the manual.

50.1.8.1 Data matrix. The entry under the data matrix column shall be related by number, alpha designator and title to the function(s) identified for that item on the depot functional flow chart contained in Section II.

50.1.8.2 Support equipment. List the DSE item numbers, from Table II of Section I, required to accomplish the task.

DEPOT SUPPORT MATRIX

DATA MATRIX			SUPPORT EQUIPMENT (FROM TABLE II-SECTION I)	SUPPORT DATA		
NO.	FUNCTION	NAME		NUMBER	TYPE	APPLICATION
1.1	a	Test	1, 2, 3	Z2-31253, Para. 7.6.2.2 Sec. 1, Supp	Doc	Fault Isolation
				X2-10337	Doc	Acceptance
				16385	Schem	Wiring Diag.

PART NO. 1790-1B (10-20677-4)   NAME: AMPLIFIER, ELECTRONIC CONTROL   DATA MATRIX NO. 1.1

FIGURE 7. Sample Depot Support Matrix

Table III. Depot Support Matrix Abbreviations

Accel	Acceleration	Meas	Measure/Measurement
Accept	Acceptance	Mfg	Manufacture/Manufacturing
Adj	Adjustment	Mod	Modification
Assy	Assembly	Opr	Operation/Operating
Diag	Diagram	P/L	Parts List
Doc	Document	P/N	Part Number
Dwg	Drawing	P/O	Part of
Elec	Electrical/Electronic	Proc	Procedure
Equiv	Equivalent	Rem	Removal
Func	Function/Functional	Schem	Schematic
Ident	Identification	Supp	Supplemental
Inst	Instruction/Installation	Trans	Transportation
LM	List of Material	T/S	Test Set
Lub	Lubricate/Lubrication	WCL	Wire Connection List
Maint	Maintenance		

50.1.8.3 Support data. Identify all drawings, diagrams, specifications, technical manuals and other documents under the support data column that are necessary for the performance of the indicated function(s). When only parts of the identified document are required to support the function(s), indicate specific paragraphs, tables, and appendices.

50.1.8.4 Easy reference. At the bottom of each page, in the space provided for that purpose, list each data matrix number identified on the page. Data matrix numbers will be arranged in numerical sequence. Enter the part number and name in the space provided at the bottom of the page only if a single part number is contained on the page.

50.1.8.5 Hardness information. The contractor will indicate hardness critical items (HCIs) by placing a flagnote $\boxed{HCI}$ adjacent to the part number and name of the affected depot reparable, at the bottom of the page or within the body of the matrix.

50.1.9 Section IV, Depot Data Status List (DDSL). In the preface to Section IV, include the following:

NOTE

All data, referenced in Section III and utilized at the depot, must be at least as recent as that indicated in the following list. Some data may be more recent than indicated in this list if supplied since the last issue of this Control Manual, but in no case should any data be of an earlier version. ALL VARIATIONS IN DATA STATUS MUST BE REPORTED.

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Record all support data referenced in Section III and the current status of such documents. Use the format of Figure 8. Air Force supplied data will be listed in the DDSL.

50.1.9.1 Drawings/documents. Record each drawing and document in alphanumeric sequence.

50.1.9.2 Sheet number identification. Identify the specific drawing sheet by the number which is applicable for the task.

50.1.9.3 Change letter/change date. Enter either the applicable change letter or change date of the drawing/document and sheet number identified.

50.1.9.4 Changes. List incremental changes such as engineering orders (EOs), engineering change notices (ECNs), advanced engineering change orders (AECOs), etc., which might be released against the applicable drawing/document. When documents listed are not subject to the configuration control of the using control manual, but are supplied under an associated control manual, list the number of the associated manual.

50.1.10 Reparable parts index. List in alphanumeric sequence all reparable equipment in Section III. Identify equipment by part number or type number, and identify the page(s) of Section III where the applicable SE and support data are referenced. See Figure 9.

50.1.11 Glossary. The glossary shall comply with MIL-M-38784A.

60. NOTES

60.1 Incorporation of data changes. Data changes, additions, or deletions that affect the support data column of Section III in the control manual will normally be released concurrently with the referenced support data, whether by change page or revision.

DEPOT DATA STATUS LIST

DRAWING/ DOCUMENT	SHEET NO.	CHG LTR OR CHG DATE	CHANGES
AA0101-003			Ref TO-XXX-XX-X
AA0102-004	1	B	
AA0108-008		C	
AA0203-406	3	E	
AA0301-038		F	
AA0303-019		A	
ABD0473-101-024N		NC	
ABD0473-105-024N		NC	
ABD0473-187-024N		AV	
ABD1800-080-000N			Ref TO-XXX-XX-X
ABD1800-545-024N			Ref TO-XXX-XX-X
ABL1800-200-000N			Ref TO-XXX-XX-X
C78-18/201 Vol 1		12-19-79	
C78-18/201 Vol 2		12-19-79	

FIGURE 8. Sample Depot Data Status List

REPARABLE PART INDEX

Part/Equipment Number	Page Number	Part/Equipment Number	Page Number
ACAY201	3-359	01-00683-001, -002	3-482
BACC61R63P	3-591	01022-00001	3-591
BCAY199	3-359	03-01403-008	3-41
CR143Z10007	3-83	03-01404-003	3-44
GS3555	3-588	03-01415-003	3-46
GS3556	3-588		
GS3558	3-588	03-01489-003	3-47
HTE 21-51000-15	3-196	03-01494-003	3-44
HTE 21-51001-6, -7, -14	3-196	10-20496-32	3-14
HTE 25-41803-8, -22	3-196	10-20496-41, -42	3-13
IT-53228	3-584A	10-20677-4	3-4
KFB40	3-255	10-20842-3	3-83
KFB41	3-256		
KMX-131-1			
KMX-131-2			
LA10	3-582	10-21549-1	3-300
TE 25-43511-1	3-225	10-21552-6	3-356
VPS-51L	3-580	10-21553-20	3-354
W4000	3-194	10-21560-1	3-561
W4001	3-193	10-21652-1, -2	3-537
W4005	3-195	10-21653-1	3-525
01-00517-006	3-41	10-21668-1, -2	3-500B
01-00533-003	3-44	10-21676-1, -2	3-481
01-00682-001, -002	3-481		

FIGURE 9. Sample Reparable Part Index

APPENDIX B

DATA ITEM DESCRIPTIONS

10. REFERENCES.

10.1 Data items generated by this standard are not deliverable unless specified in the contract data requirements list (CDRL). The data generated by this standard include the following:

Paragraph	Data Requirement	DID
5.1	Control Manuals	DI-M-30430
5.1.4	Control Manual Outlines	DI-M-30431

10.2 Data items associated with this standard are not deliverable unless specified in the contract data requirements list (CDRL). The data associated with this standard include the following:

Paragraph	Data Requirement	DID
5.1.5.2	Technical Orders (Supplemental Data)	DI-M-3407A
5.2.1.2	Validation Certification	DI-M-3408
5.3	Changes and Revisions	DI-M-3407A

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DOCUMENT IDENTIFIER *(Number)* **AND TITLE**

DOD-STD-1768(USAF) Procedures for Development of Depot Technical Data

NAME OF ORGANIZATION AND ADDRESS OF SUBMITTER

☐ VENDOR   ☐ USER   ☐ MANUFACTURER

1. ☐ HAS ANY PART OF THE DOCUMENT CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?   ☐ IS ANY PART OF IT TOO RIGID, RESTRICTIVE, LOOSE OR AMBIGUOUS? PLEASE EXPLAIN BELOW.

A. GIVE PARAGRAPH NUMBER AND WORDING

B. RECOMMENDED WORDING CHANGE

C. REASON FOR RECOMMENDED CHANGE(S)

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