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MILITARY SPECIFICATION

TEST REQUIREMENTS DOCUMENT, PREPARATION OF

This specification is approved for use by the National Security Agency and Central Security Service, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE.

1.1 Scope. This specification establishes requirements for the development and preparation of test requirements documents (TRD) for hardware, computer programs and firmware configuration or critical items.

1.2 Purpose. The purpose of this specification is to identify the tests to be performed, the types and quantities of test equipment and performance criteria for demonstration and verification of compliance with established end item functional characteristics.

1.3 Application. Test requirements documents are prepared by those activities responsible for design, development and testing of deliverable functional electronic, computer program and firmware configuration or critical items when the functional characteristics for the end item have been established. This specification is applicable to:

a. Systems
b. Subsystems
c. Equipment
d. Components
e. Assemblies
f. Subassemblies
g. Interface items

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Director, National Security Agency, Chief, Central Security Service, Code T2137, Fort George G. Meade, MD 20755-6000 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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h. Parts
i. Modules
j. Program modules
k. Boards
l. Circuits

2. APPLICABLE DOCUMENTS.

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

MILITARY SPECIFICATIONS

DOD-D-1000 - Drawings, Engineering and Associated Lists
MIL-D-5480 - Data, Engineering and Technical, Reproduction Requirements for
MIL-M-9868 - Microfilming of Engineering Documents, 35mm, Requirements for

MILITARY STANDARDS

DOD-STD-100 - Engineering Drawing Practices
MIL-STD-490 - Specification Practices
DOD-STD-7935 - Automated Data Systems (ADS) Documentation

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein.

DoD 5220.22-M - Industrial Security Manual for Safeguarding Classified Information

DS-61 - Data Standard for Preparation of Engineering Documentation

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

2.2 Other publications. The following document(s) form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

IEEE STD 200 - Reference Designations for Electrical and Electronic Parts and Equipment

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(Applications for copies should be addressed to: The Institute of Electrical and Electronics Engineers, Inc., 345 East 47th Street, New York, NY 10017.)

(Industry association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS.

3.1 General requirements. A separate TRD shall be developed for each major category of testing, such as qualification test, acceptance test, and component test. Each TRD shall contain comprehensive and detailed coverage applicable to the test requirements for the item being tested. The coverage shall include sufficient data to demonstrate and verify compliance of the item with the established functional characteristics and performance parameters defined by the contract and the end item specification. The coverage shall include:

a. A description of all visual, mechanical, electrical, functional and operational tests.

b. Identification of types and quantities of test tools and test equipment.

c. Criteria for determining acceptable performance of the item being tested.

3.1.1 In-process testing. System TRDs shall not include in-process inspection or testing requirements.

3.1.2 Subassembly tests. In those cases where performance requirements cannot be verified on the end item, limits and tests for operation characteristics should be specified for subassemblies.

3.1.3 Troubleshooting. TRDs shall not contain details for troubleshooting to the piece-part level unless otherwise specified in the contract.

3.1.4 TRD development. TRDs shall be developed in two phases: Preliminary and Final.

3.1.4.1 Preliminary TRD (Phase I). A preliminary draft of the TRD shall be based upon the engineering, programming and logistics support efforts required for design and test of the configuration or critical item. The preliminary draft shall be compatible with the performance, design and test requirements contained in the individual end item specification. The preliminary TRD shall meet the requirements of this specification and be fully representative of the final TRD.

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3.1.4.2 Final TRD (Phase II). A final copy TRD shall incorporate comments and recommendations resulting from coordination and review of the preliminary draft. The final TRD shall be fully legible and reproducible and shall meet the requirements of this specification.

3.1.5 Identification. Each TRD shall be identified by a unique identification number assigned by the procuring activity (see 6.2.1). The assigned identifier(s) shall be used on preliminary drafts and final copies and shall remain unchanged throughout the life cycle of the TRD. Drawing numbers shall not be used as TRD identifiers.

3.1.6 Security classification. Security classification markings shall conform to the requirements of DoD 5220.22-M and shall appear centered at the top and bottom of each page (see 4.2.1).

3.1.7 Reference designations. Reference designations shall be in accordance with the unit numbering method defined in IEEE STD 200 (formerly ANSI Y32.16) and shall be consistent within the text, supporting illustrations and related engineering drawings.

3.1.8 Engineering drawings. Engineering drawings and associated lists prepared to support the TRD shall be in accordance with DOD-D-1000, DOD-STD-100 and DS-61. In case of a conflict between the requirements of DOD-D-1000 and DOD-STD-100 and the requirements of DS-61, DS-61 takes precedence (see 4.2.2).

3.1.9 Illustrations. The TRD shall contain illustrations or diagrams of set-ups, charts, wave forms and test patterns, as applicable, to support the descriptions of procedures, hookups or test steps.

3.1.10 Narrative. The TRD shall include sufficient narrative material to correlate the test, test and alignment procedure, pictorial and graphic illustration and hookup diagram data.

3.1.11 Style and composition. The general aspects of style and composition shall be in accordance with the language style, paragraph numbering and identification, underlining, cross reference, figures, tables, foldouts and footnotes requirements of MIL-STD-490.

3.1.12 Clarity and legibility. Final copies of TRDs and associated engineering drawings shall be of such clarity that when reproduced, they will produce copies conforming to the legibility requirements of MIL-D-5480 (see 4.2.4).

3.1.13 Microfilm. Microfilm of TRDs and associated engineering drawings shall conform to MIL-M-9868 (see 4.2.5).

3.1.14 Changes and revisions. Changes and revisions to a final TRD shall be in accordance with the format and content requirements of this specification.

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3.2 Format. Each TRD shall be developed using the following format:

a. Cover sheet
b. Approval sheet
c. Revision summary sheet
d. Configuration data
e. Test requirements

3.2.1 Test sections. When specified in the contract, the test requirements for that TRD shall be sectionalized to cover the individual tests of the major test category: environmental, TEMPEST, RFI, etc. A separate section for each test shall include the detailed test information for that test.

3.2.2 Standard form. Each TRD shall be prepared on 8-1/2 by 11-inch bond paper (Size A Book Size Drawings). However, if the contract specifies engineering drawings, the TRD shall be part of the drawing package, and Size A drawing forms furnished by the procuring activity shall be used.

3.3 Content.

3.3.1 Cover sheet. The cover sheet shall identify the item to be tested by name, nomenclature, TRD identification number, and name of pertinent contractor, manufacturer and preparer.

3.3.2 Approval sheet. The approval sheet shall identify the appropriate signature(s) and the name, title and organization of the person(s) approving the TDR.

3.3.3 Revision summary sheet. The revision summary sheet shall be used for recording all revisions made to the TRD or its parts. Each revision shall be identified by the following:

a. Page number
b. Revision letter
c. Approved
d. Date
e. Item configuration number
f. Engineering Change Proposal (ECP)
g. Reason for change

3.3.4 Configuration data. The configuration data shall consist of all engineering documents applicable to the item being tested and referenced in the TRD. The documents shall be identified by document number, title and revision date.

3.3.5 Test requirements. Test requirements shall be specified using the following content and format guidelines, as applicable for:

a. Hardware (See 3.3.5.1)
b. Computer Program (See 3.3.5.2)
c. Firmware (See 3.3.5.3)

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3.3.5.1 Hardware test requirements. The types of tests necessary to validate design and verify performance requirements by the simplest methods shall be specified and shall include, as appropriate:

a. Visual examination of the item prior to start of tests.
b. Mechanical examination of the item prior to start of tests.
c. Counters.
d. Alarms.
e. Pattern generator.
f. Power supply-voltage, frequency and phasing variations.
g. Random (manual and automatic).
h. Operational (remote, pulse, overall, various modes).
i. Any additional applicable tests.

3.3.5.1.1 Test tools, test equipment and facilities. All test tools, test equipment and facilities required for all test requirements for the configuration item being tested shall be listed by type and quantity. Common test equipment shall be identified for all testing unless otherwise approved by the procuring activity. Examples of the types of equipment and tools include:

a. Special jigs and fixtures.
b. Testing aids.
c. Commercial test equipment.
d. Government furnished equipment.
e. Power supplies, signal generator.
f. Firmware burn-in and test devices.

3.3.5.1.2 Special test tools, equipment and facilities. When special jigs, fixtures, testing aids and special test equipment are required to complete the test, sufficient information shall be provided to recreate those special set-ups.

3.3.5.1.3 Hookup methods. Methods of hookup shall be specified and include, as applicable:

a. Detailed procedures for interface connections.
b. Identification of terminals and connectors used.
c. Identification of interconnecting cables.
d. Special test circuit diagrams.

3.3.5.1.4 Pretest data. Adjustments, dial and switch positions necessary prior to the start of the tests shall be specified.

3.3.5.1.5 Test conditions. Test conditions essential for conducting the tests shall be identified.

3.3.5.1.6 Safety requirements. Safety precautions and practices with emphasis on those which are unique shall be identified.

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3.3.5.1.7 Test data records. The TRD shall include a form(s) for recording of test data derived from the test performance for subsequent analysis. The test data records shall include specific measurements to be made and identify the data to be recorded.

3.3.5.1.8 Operation limits. Maximum and minimum operation limits shall be established.

3.3.5.1.9 Performance criteria. Specific criteria shall be established for use or acceptance of the types of tests required to determine acceptable performance of the item being tested. Criteria shall be in compliance with the performance parameters set forth in the contract or item specification.

3.3.5.1.10 Test procedures. The test procedures shall establish logical and sequential operations to permit determination that the item specification requirements have been satisfactorily met with minimum expenditure of time and effort. Clarifying and supportive notes shall be included, as necessary, to assure ready understanding of each step in the test process. Test Procedures shall specify:

a. Each function and step required to obtain the desired result.
b. Test results to be expected.
c. Provisions for recording of data results actually obtained.
d. Arrangement of test sequence for optimum performance.
e. Functional and performance tests which will verify proper alignment, as well as function of meters, switches, indicators, controls, alarms, etc.

3.3.5.2 Computer program test requirements. Test requirements for computer programs shall be in accordance with the Test Specification and Evaluation and Test (Identify) Description sections of the Test Plan requirements of DOD-STD-7935. Paragraph numbering shall be consistent with the requirements of this specification.

3.3.5.3 Firmware test requirements. Test requirements for firmware shall in corporate applicable sections of hardware test requirements (see 3.3.5.1) and computer program test requirements (see 3.3.5.2) to insure thorough coverage of all tests to be performed.

3.3.6 Documentation. The TRD shall conform to the following documentation guidelines:

3.3.6.1 Systems, subsystems, unique equipments and printed circuits. When the contract or contract data requirements list specify TRD for systems, subsystems, unique equipments and/or printed circuits, the documentation shall include tests, test and alignment procedures, necessary pictorials and graphic illustrations, hookup diagrams, test conditions, and sufficient narrative material to correlate such data. Test and procedures in the TRD shall establish logical and sequential operations, so that adherence to them will permit determination that individual end items test documentation requirements have been satisfactorily met with minimum expenditure of time and effort.

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3.3.6.2 Assembly, subassembly or elements. When the contractor requirements specify TRD (qualification, acceptance, end item, etc.) for assembly, subassembly, or elements, the documentation shall contain the performance criteria, test parameters, reliability criteria, or inspection acceptance requirements to fully support test, procurement, or manufacture of the individual item depicted. Use of memory type or magnetic card text processing machines in order to document or revise TRD and textual type drawings is encouraged.

3.3.6.3 Repetitive documentation. When TRD or any documentation is applicable to more than one part or assembly a separate drawing shall be prepared in lieu of repeating the information on the individual drawings. For example, when drawings are required to define several unique transistors, but all have common requirements, the common requirements shall be documented in one drawing and the unique requirements defined on the individual drawings. The drawing containing the common requirements shall be referenced on the individual drawing.

4. QUALITY ASSURANCE PROVISIONS.

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order (see 6.2.1) the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure the TRD and associated engineering drawings conform to prescribed requirements.

4.2 Quality conformance inspection. Inspection of the TRD shall include the following inspections:

4.2.1 Classified information. Classified information is properly marked (see 3.1.6).

4.2.2 Drawings. Engineering drawings and associated lists are as specified (see 3.1.8).

4.2.3 Content and format. Content and format are in accordance with Section 3.

4.2.4 Reproducibility. TRDs shall be inspected for clarity, legibility and reproducibility (see 3.1.12).

4.2.5 Microfilm. Microfilm quality is as specified (see 3.1.13).

4.3 In-process inspection. Representatives of the contracting officer shall be permitted to inspect the TRD under preparation at the contractor's facilities during the contractor's normal working hours.

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4.4 Review. The acquiring activity reserves the right to review each TRD and illustration, or any part thereof, for corrections, deletions or additions, and to reject, in whole or in part, until it has been demonstrated that a TRD that conforms to all contract or tasking requirements has been provided.

4.5 Acceptance. Acknowledgement by the acquiring activity (Phase I) of the receipt of the draft (including illustrations) shall not be construed as a waiver of inspection and review by the editing and approving activity or as approval of the draft material submitted. Any approval given by the Government during preparation of the draft (including illustrations), or approval for shipment of any printed publication resulting therefrom, shall not be considered as a guarantee of final acceptance of the completed draft. Final acceptance is contingent upon completion of all contractually required reviews, compliance with the requirements of this document, and the incorporation of essential comments and corrections.

5. PREPARATION FOR DELIVERY.

5.1 General requirements. The following requirements apply to shipment to the Government and to shipments made at the request of the Government.

5.1.1 Reproducible TRDs including originals. When delivery of reproducible TRDs and associated engineering drawings is a contractual requirement, preparation for delivery shall conform to MIL-D-5480. Originals, when ordered, shall be packaged in accordance with the same requirements applicable to reproducibles, or as otherwise specified in the contract or order.

5.1.2 Microfilm. When delivery of microfilm of TRDs and associated engineering drawings is a contractual requirement, preparation for delivery shall conform to MIL-M-9868 or as specified in the contract or order.

6. NOTES.

6.1 Intended use. TRDs prepared in accordance with this specification are used to determine whether the end item offered for Government acceptance meets all functional requirements specified in the contract and end item specification. TRDs are used for reprocurement testing of systems, equipments and subassemblies and will become part of the acceptance criteria for the item.

6.2 Ordering data. Procurement documents will specify the following information for each TRD.

6.2.1 Acquisition requirements.

a. Title, number and date of this specification.

b. Whether content and format requirements are for hardware, computer program, or firmware test requirements (see 3.3.5).

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c. Whether troubleshooting to the piece-part level is required (see 3.1.3).

d. Whether the TRD is part of an engineering drawing package (see 3.2.2).

e. Whether the sectionalized format for areas of major test categories is to be used (see 3.2.1).

f. Identify the assigning activity for the TRD identification number (see 3.1.5).

g. The applicable data item description (see 6.2.2).

h. Quantity and type of reproduction.
i. Whether microfilm is required.

j. Whether delivery of originals for the TRD and associated drawings is required.

k. Whether special packaging is required.

l. Delivery schedule and to whom the TRD and associated drawings are to be delivered.

6.2.2 Data requirements. When this specification is used in an acquisition which incorporates a DD Form 1423, Contract Data Requirements List (CDRL), the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved CDRL incorporated into the contract. When the provisions of FAR 52.227-7031 are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification is cited in the following paragraphs.

Paragraph No.	Data requirement title	Applicable DID no.	Option
3.1	Test Requirements Document	DI-ATTS-80002	--

(Data item descriptions related to this specification, and identified in section 6 will be approved and listed as such in DOD 5000.19-L, Vol. II, AMSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

6.3 Disclosure of information. The contractor shall not divulge any information regarding the use of any test specification to any person not specifically authorized in writing by the Fort George G. Meade Procurement Division, 9800 Savage Rd., Fort George G. Meade, Maryland.

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6.4 Copies. Copies of this document may be obtained, upon request, through the Contracting Officer. When requesting copies, the exact title and number of the document shall be stipulated and the purpose for which it is required must be stated.

Preparing activity:
NSA - NS

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER

2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION

b. ADDRESS *(Street, City, State, ZIP Code)*

4. TYPE OF ORGANIZATION *(Mark one)*

- ☐ VENDOR
- ☐ USER
- ☐ MANUFACTURER
- ☐ OTHER *(Specify)*: _____

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional

b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional

c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional

8. DATE OF SUBMISSION *(YYMMDD)*

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