

MIL-T-81990(AS)
17 March 1975

MILITARY SPECIFICATION

TEST SET, COUNTERMEASURES AND CHAFF DISPENSER AN/ALM-164

This specification has been approved by
the Naval Air Systems Command, Department
of the Navy.

1. SCOPE

1.1 Scope - The equipment covered by this specification shall be for operational checkout of the Dispensing Set, Countermeasures and Chaff AN/ALE-39. This specification covers design, development and test requirements for the equipment. The equipment shall be for organizational and intermediate use as defined for class 2 and 3 of MIL-T-21200.

1.2 Classification - The equipment covered by this specification shall consist of the following items:

<u>Goodyear Aerospace Drawing Number</u>	<u>Nomenclature</u>	<u>Reference Paragraph</u>
3100304-001	Test Set AN/ALM-164	3.7.1
3100307-001	Cable Assy W-2X	3.3.2
3100307-002	Cable Assy W-5X	3.3.2
3100307-003	Cable Assy W-1	3.3.2
3100307-004	Cable Assy W3 & W4	3.3.2

1.3 Associated equipment - The equipment shall operate with the following associated equipment:

- a. TS-2894/ALM-70A Continuity and Stray Voltage Test Set
- b. MX-8455/ALM-70A Test Adapter (preferred)
- c. MX-7910/ALM-70 Test Adapter (Alternate for the MX-8455/
ALM-70A)

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2. APPLICABLE DOCUMENTS

2.1 General - The following documents of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein.

SPECIFICATIONS

Military

MIL-K-3926	Knob, Control (for use with Electronic Communications, and Allied Equipment)
MIL-Q-9858A	Quality Program Requirements
MIL-E-17555	Electronic and Electrical Equipment and Associated Repair Parts, Preparation for Delivery of
MIL-T-18303	Test Procedures; Preproduction, Acceptance, and Life for Aircraft Electronic Equipment, Format for
MIL-N-18307	Nomenclature and Nameplates for Aeronautical Electronic and Associated Equipment
MIL-T-21200	Test Equipment for Use with Electronic and Electrical Equipment, General Specification for
MIL-D-81694	Dispensing Set, Countermeasures and Chaff AN/ALE-39

STANDARDS

Military

MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-454	Standard General Requirements for Electronic Equipment
MIL-STD-461	Electromagnetic Interference Characteristics Requirements for Equipment
MIL-STD-704	Electric Power Aircraft Characteristics and Utilization of
MIL-STD-794	Parts and Equipment

DRAWINGS

Goodyear Aerospace Corporation Drawings

3100301-001	Schematic, AN/ALM-164
3100304-001	Test Set, Countermeasure Chaff Dispenser AN/ALM-164

2.1.1 Availability of documents -

- (1) When requesting specifications, standards, drawings, and publications, refer to both title and number.

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Copies of this specification and applicable specifications required by contractors in connection with specific procurement functions may be obtained upon application to the Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120.

3. REQUIREMENTS

3.1 Testing - This specification makes provision for testing (see 4).

3.2 Materials, parts, and processes - The materials, parts, and processes shall be in accordance with MIL-T-21200, except as specified herein.

3.2.1 Selection of parts, materials, and processes - Except as specified herein, MIL-T-21200 shall apply for the selection of parts, materials and processes.

3.2.2 Approval of non-standard parts and materials - Approval for the use of non-standard parts and materials shall be in accordance with MIL-T-21200. Requests for approval shall be submitted to Naval Missile Center, Pt. Mugu, Code 5233.

3.3 Design and construction - The design and construction of the equipment shall be in accordance with MIL-T-21200 except as modified herein.

3.3.1 Total weight - The total weight of the equipment, including cables, shall be a minimum consistent with good design and shall not exceed 45 pounds.

3.3.2 Cables and connectors - The equipment shall provide for the use of cables and connectors. Insofar as is practicable, all connectors on the front panel shall be mounted along the lower edge of the panel and in no case shall their location be such that the connecting cables will interfere with the operating controls. Cable assemblies shall be as depicted in Goodyear Aerospace drawings 3100307-001, -002, -003, and -004.

3.3.2.1 Cabling - The test equipment cabling shall be compatible with the equipment to be tested. It shall be the electrical equivalent of the cabling used in the normal installation of the equipment being tested.

3.3.2.2 External connectors - External connectors shall provide for the following:

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<u>Reference Designation</u>	<u>Connector Type</u>	<u>Function</u>
J-1	MS3122E12-3P	28V DC Input
J-2 - J-5	M39012/21-0003	Programmer Pulse Mon.
J-6	MS3122E16-26PW	Programmer Input
J-7, J-8	MS3122E18-32P	Dispenser Output
J-9	M39012/21-0003	Programm. Clock Freq.
J-10	M39012/21-0003	Firing Pulse Monitor

3.3.3 Controls - Operating controls shall be in accordance with MIL-STD-454 Requirement 28. Knobs shall conform to MS 91528 in accordance with MIL-K-3926. Controls shall be provided for:

- a. Payload Selection
- b. Fire Common Selection
- c. Circuit Selection

3.4 Reliability - The contractor shall conduct a reliability program using MIL-STD-785 as a guide as described in this section. The program plan shall be approved by the procuring activity. No demonstration shall be required and reliability shall be verified by analysis.

3.4.1 Reliability Design Evaluation - A reliability prediction shall be made using MIL-STD-756 as a guide. Predictions shall be made for each mode of test set operation.

3.4.1.1 Failure Recurrence Control - The contractor shall implement a closed loop system for collecting, analyzing and recording failures that occur during in-plant acceptance testing and those that occur at installation sites or test sites prior to turnover to the procuring agency. The contractor failure reporting system shall include provisions to assure that effective corrective actions are taken on a timely basis and shall include follow-up audits to review all open reports, analyses and corrective actions. Delinquent open report shall be reported to management for proper resolution.

3.4.1.2 Interference Control - As a design goal the generation of electromagnetic interference by the equipment and the vulnerability of the equipment to electromagnetic interference shall be controlled within the limits of MIL-STD-461 (Notice 1), for Class IC equipment.

3.4.2 Nomenclature and nameplates - Nomenclature assignment and nameplate approval for equipment identification shall be in accordance with MIL-N-18307.

3.4.3 Service conditions - Service conditions (environmental) shall be in accordance with the following:

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3.4.3.1 Shock - As specified in MIL-T-21200 for equipment mounted in Transit and Combination Cases.

3.4.3.2 Vibration - The application of vibration shall be as specified for Class 2 and 3 equipment in MIL-T-21200.

3.4.3.3 Humidity - As specified in MIL-T-21200.

3.4.3.4 Salt atmosphere - As specified in MIL-T-21200 for Class 2 equipment.

3.4.3.5 Sand and dust - As specified in MIL-T-21200 for Class 2 equipment.

3.4.3.6 Temperature-altitude combination - As specified in MIL-T-21200 for Class 3 equipment.

3.4.4 Standard conditions - The following conditions shall be used to establish normal performance characteristics under standard conditions and for making laboratory bench tests.

Temperature	Room ambient (25°C \pm 5°C)
Altitude	Normal ground
Vibration	None
Humidity	Room ambient (up to 90% relative humidity)
Input power voltage	28 \pm 2V DC

3.5 Transportability - Transportability requirements shall be in accordance with MIL-T-21200.

3.6 Performance characteristics - The performance of the equipment shall be as specified herein.

3.6.1 Electrical power source - The test equipment shall operate from a power source as specified in MIL-T-21200 (28 \pm 2V DC).

3.6.1.1 Protection - The equipment shall be capable of withstanding input power variations as imposed by abnormal electric system operations as defined in MIL-STD-704.

3.7 Detail requirements -

3.7.1 Test set, AN/ALM-164 - The equipment shall meet the following requirements:

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3.7.1.1 Function - The equipment as depicted on Goodyear Aerospace Dwg. 3100304-001, shall function as a system tester for the AN/ALE-39 Countermeasure Chaff Dispensing Set as defined in MIL-D-81694. The test set shall function in three principle ways:

- a. As a passive monitor of firing circuit outputs,
- b. As flight line troubleshooting equipment,
- c. As bench test equipment.

3.7.1.1.1 Passive monitor function - The equipment shall function as a passive monitor by furnishing an interface to individual indicator lamps for each firing circuit.

3.7.1.1.2 Flight line troubleshooting - Standard test connections shall be provided to permit use of a multimeter or oscilloscope for troubleshooting the AN/ALE-39 Dispensing Set system and components, and to measure control and operating signals of the system.

3.7.1.1.3 Bench test function - The equipment control panel shall provide for simulation of A/C cockpit controls to provide functional control during bench testing. This shall also provide for isolation of A/C controls during 3.7.1.1.2 function.

3.7.1.2 Form factor - The equipment shall incorporate a combination case 21.5 inches long by 15.50 inches wide by 10.5 inches high.

3.7.1.3 Content - The equipment shall contain the following assemblies, subassemblies, circuits;

- a. Five cable assemblies contained in the 310034-001 Case .
- b. Combination case in which is mounted the 3100305-001-101 Panel Assy.
- c. Control panel assembly which mounts the 3100301-001 Circuitry.
- d. Circuits as shown on Goodyear Aerospace Dwg. 3100301-001.

3.7.1.5 Controls - The following controls shall be provided on the control panel assembly:

- a. "PAYLOAD SELECTOR" with the positions for "SALVO F", "OFF", "C", "F/S", "F/M", "J".
- b. "CONTROL UNIT SEL" with positions for "TEST SET CONTROL" and "A/C CONTROL".
- c. "CIRCUIT SELECTOR" with 30 detent positions, "SYS" at the number one position and starting with the third detent through the 28th detent, shall be arabically designated "2,4,6, 28".

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3.7.2 Case, Test Set - The equipment shall be provided with a combination case conforming to the requirements of MIL-T-21200 as defined for Class 2 items.

3.8 Finish - Finishes shall be in accordance with MIL-T-21200.

3.9 Interchangeability - Interchangeability shall be in accordance with MIL-STD-454 Requirement 7.

3.10 Workmanship - Workmanship shall be in accordance with MIL-STD-454 Requirement 9.

4. QUALITY ASSURANCE PROVISIONS

4.1 Quality Program - The Contractor shall conduct a quality program in accordance with the requirements of MIL-Q-9858A.

4.1.1 Responsibility for inspection - Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. The Government reserves the right to perform any inspections deemed necessary to assure supplies and services conform to prescribed requirements.

4.2 Acceptance Tests - The contractor shall be responsible for accomplishing the acceptance tests. The contractor shall furnish test reports showing quantitative results for all acceptance tests. Such reports shall be signed by an authorized representative of the contractor. Acceptance tests shall consist of the following:

- | | |
|----------------------|-------|
| (1) Individual tests | 4.2.1 |
| (2) Special tests | 4.2.2 |

4.2.1 - Individual tests - Each equipment submitted for acceptance shall be subjected to the individual tests. These tests shall be adequate to determine compliance with the requirements of material, workmanship, and operational adequacy. As a minimum each equipment accepted shall have passed the following tests:

- | | |
|----------------------------|---------|
| (1) Examination of product | 4.2.1.1 |
| (2) Operation test | 4.2.1.2 |

4.2.1.1 Examination of product - Each equipment shall be examined carefully to determine that the material and workmanship requirements have been met.

4.2.1.2 Operational test - Each equipment shall be operated long enough to permit the equipment temperature to stabilize and to check sufficient characteristics and record adequate data to assure satisfactory

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equipment operation. Test procedures shall be prepared and approved in accordance with paragraph 4.4 Test Procedures.

4.2.2 Special tests - Special tests shall be conducted on a quantity of equipments for the purpose of checking the effect of any design or material change on the performance of the equipment and to assure adequate quality control.

4.2.2.1 Special test schedule - Selection of equipments for special tests shall be made as follows:

- a. On an early equipment after an engineering or material change.
- b. Whenever failure reports or other information indicate additional tests are required.

4.2.2.2 Scope of tests - Special tests shall consist of such tests as are mutually established by the contractor and procuring activity. Test procedures previously approved for the preproduction tests shall be used where applicable. When not applicable, the contractor shall prepare a test procedure and submit it to the Naval Missile Center, Pt. Mugu, Code 5233 for approval prior to conducting the tests.

4.2.3 Equipment failure - Should a failure occur during the acceptance test the following action shall be taken:

- a. Determine the cause of failure.
- b. Determine if the failure is an isolated case or design defect.
- c. Submit to the procuring activity for approval, proposed corrective action intended to reduce the possibility of the same failure(s) occurring in failure tests.
- d. Where practical, include a test in the individual test to check all equipment for this requirement until reasonable assurance is obtained that the defect has been satisfactorily corrected.

4.3 First Unit Test - In addition to the acceptance tests identified in paragraph 4.2, one of the first five units shall be subjected to the vibration environment specified in MIL-T-21200, para. 3.2.19.4 for Class 2 or 3 equipment. One of the first five units shall also be subjected to the shock environment specified in MIL-T-21200, para. 3.2.19.5.3 (Transit and Combination Cases).

4.4 Test procedures - The procedures used for conducting acceptance tests shall be prepared by the contractor and submitted to the Naval Missile Center, Pt. Mugu, Code 5233 for review and approval. MIL-T-18303 shall be used as a guide for preparation of test procedures.

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4.5 Presubmission testing - No item, part of complete equipment shall be submitted by the contractor until it has been previously tested and inspected by the contractor and found to comply, to the best of his knowledge and belief, with all applicable requirements.

4.6 Rejection and retest - Equipment which has been rejected may be reworked or have parts replaced to correct the defects and resubmitted for acceptance. Before resubmitting, full particulars concerning previous rejection and the action taken to correct the defects found in the original shall be furnished to the government inspector.

5. PREPARATION FOR DELIVERY

5.1 General - All major units and parts of the equipment shall be preserved, packaged, packed and marked for the level of shipment specified in the contract or order in accordance with MIL-E-17555 and MIL-STD-749. In the event the equipment is not covered in MIL-E-17555, the method of preservation for Level A shall be determined in accordance with the selection chart in Appendix D of MIL-STD-794.

5.2 Marking - In addition to any special marking required by the contract or order, each unit package and exterior container shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use - The equipment is intended for use as a systems tester for the AN/ALE-39 Dispensing Set.

6.2 Performance objectives - Minimum size and weight, simplicity of operation, ease of maintenance, and an improvement in the performance and reliability of the specific functions beyond the requirements of the specification are objectives which shall be considered in the production of this equipment. Where it appears a substantial reduction in size and weight or improvement in simplicity of design, performance, ease of maintenance or reliability will result from the use of materials, parts and processes other than those specified in MIL-T-21200, it is desired that their use be investigated. When investigation shows advantages can be realized, a request for approval shall be submitted to the procuring activity for consideration. Each request shall be accompanied by complete supporting information.

6.3 Precedence of documents - When the requirements of the contract, this specification, or applicable subsidiary specifications are in conflict, the following precedence shall apply:

- a. Contract - The contract shall have precedence over any specification.
- b. This specification - This specification shall have precedence

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over all applicable subsidiary specifications. Any deviation from this specification, or from subsidiary specifications where applicable, shall be specifically approved in writing by the procuring activity.

- c. Referenced specification - Any referenced specification shall have precedence over all applicable subsidiary specifications referenced therein. All referenced specifications shall apply to the extent specified.

6.4 Ordering data - Purchasers should exercise any desired options offered herein, and procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Selection of applicable levels of packaging and packing (see 5.1).

6.5 Type designation - The parentheses (*), when used in the type designation, will be deleted or replaced by either a number or letter furnished by the procuring activity upon application by the contractor for assignment of nomenclature in accordance with 3.4.3. The complete type number shall be used on nameplates, shipping records and instruction books, as applicable.

6.6 Revisions - In specification revisions and superseding amendments an asterisk "*" preceding a paragraph number denotes paragraphs in which changes have been made from the previous issue. This has been done as a convenience only and the government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content as written, irrespective of the asterisk notations and relationship to the last previous issue.

6.7 Specification cognizance - This specification is under the cognizance of AIR-534.

6.8 Definitions - To be determined

Custodians

Navy - AS

Preparing Activity

Navy - AS
Project No. 5865-N006