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SUPERSEDING
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31 January 1969

MILITARY SPECIFICATION

DEMONSTRATION: AIRCRAFT WEAPON SYSTEMS, GENERAL SPECIFICATION FOR

This specification is approved for use by the Naval Air Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification establishes the general requirements for demonstration of Naval aircraft weapon systems during full scale engineering development. The general requirements may be modified and amplified by an addendum to this specification for specific weapons systems. "Demonstration" refers to all contractor tests and evaluations conducted during full scale development including efforts associated with performing and reporting on the tests required by this specification.

1.2 Purpose. This specification defines the tests required for contractor demonstration of Naval aircraft prior to the final phase of DT-II (TECHEVAL).

1.3 Applicability. The requirements of this specification apply to all new aircraft weapon systems or to major modification or significant alteration to an existing system.

1.4 Addenda to this specification. Addenda shall agree with this specification in paragraph arrangement, numbering, and headings, except where a paragraph is listed in the addendum as "not applicable" or "not required," subsequent subparagraphs will be omitted. If the numbering sequence is not affected, subparagraphs may be added as required. In cases of discrepancies between this specification and the addenda, the addenda shall govern.

1.5 Deviations. The approval of analyses, test plans, procedures, or test reports which incorporate variations from the stated requirements does not constitute approval of a deviation. Deviations from the requirements of this specification, its addenda, or the detail specification may be granted only by the contracting activity in writing.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Naval Air Engineering Center, Systems Engineering and Standardization Department (SESD) Code 53, Lakehurst, NJ 08733-5100, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 1510

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents, are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

MILITARY

MIL-E-5007	Engines, Aircraft, Turbojet and Turbofan, General Specification for
MIL-B-5087	Bonding, Electrical, and Lightning Protection, for Aerospace Systems
MIL-W-5088	Wiring, Aerospace Vehicle
MIL-F-5372	Fuse, Current Limiter Type, Aircraft
MIL-E-5400	Electronic Equipment, Aerospace General Specification for
MIL-T-5522	Test Requirements and Methods for Aircraft Hydraulic and Emergency Pneumatic Systems
MIL-C-5809	Circuit Breakers, Trip-Free, Aircraft, General Specification for
MIL-T-5842	Transparent Areas on Aircraft Surfaces (Windshields and Canopies), Rain Removing and Washing Systems for, De-frosting, De-icing, Defogging, General Specification for
MIL-E-6051	Electromagnetic Compatibility Requirements, System
MIL-I-6115	Instrument System, Pitot Tube and Flush Static Port Operated, Installation of
MIL-D-6728	Dampers, Engine Exhaust Flame and Glare
MIL-W-6729	Watertightness of Aircraft, Testing, General Specification for
MIL-L-6730	Lighting Equipment; Exterior, Aircraft (General Requirements for)
MIL-E-7016	Electric Load and Power Source Capacity, Aircraft, Analysis of
MIL-E-7080	Electrical Equipment, Aircraft, Selection and Installation of
MIL-C-7762	Compass, Installation of
MIL-F-7872	Fire and Overheat Warning Systems, Continuous, Aircraft, Test and Installation of
MIL-G-7940	Gages, Liquid Quantity, Capacitor Type, Installation and Calibration of
MIL-S-8512	Support Equipment, Aeronautical, Special, General Specification for the Design of
MIL-B-8565	Battery Storage, Aircraft General Specification for

MIL-A-8591	Airborne Stores, Suspension Equipment and Aircraft Store Interface (Carriage Phase), General Design Criteria for
MIL-I-8670	Installation of Fixed Guns and Associated Equipment in Naval Aircraft
MIL-I-8671	Installation of Droppable Stores and Associated Release Systems
MIL-I-8675	Installations, Aircraft Armor
MIL-C-8678	Cooling Requirements of Power Plant Installations
MIL-D-8683	Design and Installation of Gaseous Oxygen Systems in Aircraft, General Specification for
MIL-I-8700	Installation and Test of Electronic Equipment in Aircraft, General Specification for
MIL-F-8785	Flying Qualities of Piloted Airplanes
MIL-A-8860	Airplane Strength and Rigidity General Specification for
MIL-A-8861	Airplane Strength and Rigidity Flight Loads
MIL-A-8863	Airplane Strength and Rigidity Ground Loads for Navy Acquired Airplanes
MIL-A-8867	Airplane Strength and Rigidity Ground Tests
MIL-A-8868	Airplane Strength and Rigidity, Data and Reports
MIL-A-8870	Airplane Strength and Rigidity Vibration, Flutter, and Divergence
MIL-F-9490	Flight Control Systems, Design, Installation, and Test of Piloted Aircraft, (General Specification for)
MIL-F-15160	Fuses; Instrument, Power, and Telephone
MIL-F-17874	Fuel Systems, Aircraft, Installation and Test of
MIL-C-18244	Control and Stabilization Systems: Automatic, Piloted Aircraft, General Specification for
MIL-L-18276	Lighting, Aircraft Interior, Installation of
MIL-H-18325	Heating and Ventilating Systems, Aircraft, General Specification for
MIL-S-18471	System, Aircrew Automated Escape, Ejection Seat Type, General Specification for
MIL-T-18606	Test Procedures for Aircraft Environmental Systems
MIL-T-18607	Thermal Anti-Icing Systems, Wing and Empennage
MIL-A-18717	Arresting Hook Installations, Aircraft
MIL-E-18927	Environmental Control Systems, Aircraft, General Requirements for
MIL-D-19326	Design and Installation of Liquid Oxygen Systems in Aircraft, General Specification for
MIL-A-19736	Air Refueling Systems, General Specification
MIL-L-22589	Launching System, Nose Gear Type, Aircraft for

MIL-F-23447	Fire Warning Systems, Aircraft, Radiation Sensing Type, Test and Installation of
MIL-R-23761	Regulator, Voltage and Control Panels, Aircraft, Direct Current Generator, General Specification for
MIL-C-23866	Control Set, Approach Power AN/ASN-54(V)
MIL-E-24021	Electrical Power Monitors, External, Aircraft
MIL-W-25140	Weight and Balance Control System (for Aircraft and Rotorcraft)
MIL-P-26292	Pitot and Static Pressure Systems, Installation and Inspection of
MIL-P-26366	Propeller Systems, Aircraft, General Specification for
MIL-T-81571	Thermal Protective System, Aircraft Cockpit, General Specification for
MIL-B-81757	Batteries and Cells, Storage, Nickel-Cadmium, Aircraft, General Specification for
MIL-E-81910	Electrical Power Generating and Control Equipment, Aircraft, General Specifications for
MIL-C-83413	Connectors and Assemblies, Electrical, Aircraft Grounding, General Specification for
MIL-B-83769	Batteries, Storage, Lead-Acid, General Specification for
DOD-C-85050	Chargers, Battery, Nickel-Cadmium, Aircraft, General Specification for
MIL-I-85071	Inverters, Aircraft, DC to AC, General Specification for
MIL-B-85110	Bar, Repeatable, Release Holdback, Aircraft Launching, General Design Requirements for
MIL-D-85520	Design and Installation of On Board Oxygen Generating Systems in Aircraft, General Specification for
MIL-E-85583	Electric Power Generating Channel, Variable Input Speed, Alternating Current, 400 Hz, Aircraft; General Specification for
DOD-B-85584	Battery, Relay Control Unit, Aircraft
MIL-L-85762	Lighting, Aircraft, Interior, Night Vision Imaging System (NVIS) Compatible

STANDARDS

MILITARY

MIL-STD-454	Standard General Requirements for Electronic Equipment
MIL-STD-461	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference
MIL-STD-470	Maintainability Program Requirements for Systems and Equipments
MIL-STD-471	Maintainability Verification/Demonstration/ Evaluation
MIL-STD-704	Aircraft Electric Power Characteristics
MIL-STD-785	Reliability Program for Systems and Equipment Development and Production

MIL-STD-810	Environmental Test Methods and Engineering Guidelines
MIL-STD-877	Antenna Subsystems, Airborne Criteria for Design and Location for
MIL-STD-882	System Safety Program Requirements
MIL-STD-1333	Aircrew Station Geometry for Military Aircraft
MIL-STD-1385	Preclusion of Ordnance Hazards in Electromagnetic Fields, General Requirements for
MIL-STD-1388-1	Logistic Support Analysis
MIL-STD-1472	Human Engineering Design Criteria for Military Systems, Equipment and Facilities
MIL-STD-1757	Lightning Qualification Test Techniques and Aerospace Vehicles and Hardware
MIL-STD-1760	Aircraft/Store Electrical Interconnection System
MIL-STD-1795	Lightning Protection of Aerospace Vehicles and Hardware
MIL-STD-2165	Testability Program for Electronic Systems and Equipments
DOD-STD-2167	Defense System Software Development
DOD-STD-2169	High Altitude Electromagnetic Pulse Environment
MS90298	Connector, Receptacle, Electric Grounding

HANDBOOKS

MILITARY

MIL-HDBK-235-2	Electromagnetic (Radiated) Environment Considerations for Design and Procurement of Electrical and Electronic Equipment, Subsystems and Systems, Part 2

(Unless otherwise indicated, copies of federal and military specifications, standards, handbooks and bulletins are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents, drawings and publications. The following other Government documents, drawings and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

PUBLICATIONS

AR-40	All Weather Carrier Landing System Airborne Subsystem, General Requirements for
IRIG-STD-106	Range Commanders Council Telemetry Standards
OPNAVINST 3070.1	Operations Security
NAVAIRINST 3710.1	Contractor's Flight Operations
NAVAIRINST 3710.9	Anthropometric Accommodation in Naval Aircraft
OPNAVINST 4790.2	Naval Aviation Maintenance Program (NAMP) Concepts, Objectives, Policies, Organizations, and Responsibilities
NAVAIRINST 13034.1	Flight Clearance Policies

(Copies of AR-40 are available from the Naval Air Systems, Standardization Section (Code AIR-51122E), Washington, D.C. 20361-5110. Copies of NAVAIRINST are available from the Naval Air Systems Command, Forms (Code AIR-71233), Washington, D.C. 20361-7120. Copies of OPNAVINST are available from the Chief of Naval Operations, Washington, D.C. 20350. Copies of IRIG-STD are available from the Secretariat, Range Commander's Council, U.S. Army White Sands Missile Range, New Mexico 88002. Copies of NAVAIRINST and OPNAVINST are also available from the Naval Publications and Forms Center, (Code 1051), 5801 Tabor Avenue, Philadelphia, PA 19120-5099.)

2.2 Non-Government publications. The following document forms a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z39.18	Scientific and Technical Reports - Organization, Preparation and Production

(Application for copies should be addressed to the American National Standards Institute, 1430 Broadway, New York, NY 10018.)

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.4 Streamlining. This document has been streamlined. Appendix C to MIL-D-8708 lists those documents required for acquisition and is a mandatory part of MIL-D-8708. Those documents listed in appendix C have the same status as those referenced directly in MIL-D-8708 (first tier documents). All other documents, referenced through tiering, may be used as guidance and information to supplement MIL-D-8708. MIL-D-8708 is a streamlined document.

3. REQUIREMENTS

3.1 Program planning information. Before demonstrations begin, program planning information required by the Contract Data Requirements List (CDRL) shall have been submitted and approved by the acquiring activity.

3.1.1 Scope and correlative provisions.

3.1.1.1 Location of demonstration program. The location for the demonstration program shall be as defined in the Demonstration Program Plan.

3.1.2 Planning conferences. Conferences shall be conducted to facilitate accomplishment of the various categories of demonstrations. Conferences will be convened by the acquiring activity upon notification by the contractor that he is prepared to present the data or information required for the specific conference. The conference site will be selected by the acquiring activity. The time when the conference shall be scheduled is presented in Tables VIII and IX (see Appendix B).

3.1.2.1 Instrumentation planning conference. A conference shall be held not later than 18 months prior to the scheduled release of the first aircraft for flight. Participants will include representatives of the contractor, the cognizant Test Authority, and the acquiring activity. At the time of the conference, the contractor shall have prepared demonstration instrumentation data sufficiently complete to indicate the need for the instrumentation in fulfilling the demonstration requirements. The data shall include:

a. A functional block diagram and detailed description of the proposed instrumentation system. This shall include sample rates, tape recorder speeds, telemetry bandwidth requirements, and unique instrumentation requirements.

b. A complete list of variables to be measured with each demonstration aircraft and the expected overall accuracy and frequency response of each measured variable.

c. A complete list of contractor-furnished special flight test instrumentation and proposed Government-furnished instrumentation. This list shall completely identify the purpose, intended function, location, and required response characteristics of the instrumentation.

3.1.2.2 Structural conferences.

3.1.2.2.1 Structural instrumentation planning conferences. A structural instrumentation conference shall be held not later than two months prior to initiation of the flight load calibration test or the flight loads survey, whichever occurs first. If necessary, a second structural instrumentation conference shall be held in conjunction with the Structural Flight Load Survey Planning Conference.

3.1.2.2.2 Structural flight load survey planning conference. One month after submittal of the structural buildup data in the Demonstration Planning and Progress Report and prior to initiation of the flight loads survey, a conference shall be held to define the flight test plan for the loads survey.

3.1.2.2.3 Structural flight demonstration planning conference. At least one month prior to the structural demonstration tests of Table IC a conference shall be held to finalize the aircraft configuration, test procedures, and the instrumentation to be used in the demonstration. The contractor shall present substantiating data to support selection of the critical demonstration parameters for the major structural components. Summary data of the flight load survey results and structural flight limitation tests shall be included. The results of this conference shall be confirmed by submittal of a summary report.

3.1.2.2.4 Structural ground loads and carrier suitability demonstration planning conference. At least six months prior to land-based takeoff, landing, and taxi tests for land and carrier-based aircraft or carrier suitability tests, a conference shall be held to finalize the aircraft configuration, test procedures, and instrumentation to be used in the demonstration. The results of this conference shall be confirmed by submittal of a summary report.

3.1.2.2.5 Structural dynamic flight demonstration planning conference. At least one month prior to the structural dynamic flight demonstration tests, a conference shall be held to finalize the structural dynamic flight test program. Upon completion of each aeroelastic stability flight test phase, additional conferences shall be held to review the test results, determine if any deficiencies must be corrected prior to commencing the next aeroelastic stability flight test phase, and establish the maximum permissible flight speed envelope. The minutes of this conference shall be confirmed by submittal of a summary report.

3.1.2.3 Aerodynamic conferences.

3.1.2.3.1 Performance data-reduction procedures conference. At least six months prior to the performance demonstration tests, a conference shall be held to discuss the procedures and methods to be used for reduction of the performance demonstration data.

3.1.2.3.2 High Angle Of Attack (AOA) and spin planning conferences. No later than one month prior to initiation of the high AOA and spin buildup tests, a conference shall be held to establish critical flight conditions to be investigated. Upon completion of buildup spin tests, another conference shall be held to review the results of the buildup tests, and to redefine, as necessary, the tests to be formally demonstrated.

3.1.2.3.3 Performance demonstration planning conferences. A conference shall be held at least four months prior to the fuel consumption tests to review preliminary test data and establish the data presentation format and data reduction procedures to be used in preparing the guaranteed performance report.

3.1.2.3.4 Flying qualities demonstration conference. Not later than one month before the start of the formal flying qualities demonstration tests, a conference shall be held to discuss all relevant items pertaining to the demonstration.

3.1.2.4 Avionics demonstration conference. Not later than six months prior to the scheduled date for the avionics demonstration, a conference shall be held to establish test periods and sites required to perform the demonstration.

3.1.3 Operations Security (OPSEC). The contractor shall comply with the OPSEC security measures of OPNAVINST 3070.1. This applies particularly to telemetry and automatic data processing.

3.1.4 Flight monitoring.

3.1.4.1 Motion picture camera or video tape coverage. Motion picture camera or video tape coverage shall be obtained of first flights and other significant development flight tests.

3.1.4.2 Telemetry coverage. Telemetry and instrumentation recording system coverage shall be provided as specified at the instrumentation planning conference. Real-time recording and observation of critical parameters shall be provided. Telemetry shall be required for all demonstration flights. The use of telemetry on other than demonstration flights shall be mutually agreed on by the contractor and the Test Authority. At the instrumentation planning conference, and prior to procurement and installation of telemetry and instrument recording systems, the following shall be determined:

a. Compatibility of proposed telemetry equipment and instrument recording systems with IRIG Standard 106 and ground equipment at all proposed test and demonstration locations.

b. Incorporation of a backup source of power to ensure continuity of power for data acquisition in the event of primary power failure.

c. The extent to which telemetry coverage will be employed during demonstration flights witnessed by Test Authorities.

d. Data security measures.

3.1.4.3 Ground surveillance. During initial flights at the contractor's plant, takeoffs and landings shall be witnessed by both the contractor and representatives of the Test Authority. Abnormal flight characteristics shall be recorded.

3.1.4.4 Chase aircraft. Chase aircraft shall be used for the first flight of each aircraft outside the confines of the airfield. For other flights, at or near the contractor's plant or at Government facilities, determination of whether chase aircraft are to be used shall be made by the cognizant Test Authority.

3.1.5 Instrumentation.

3.1.5.1 Test instrumentation. Maximum utilization shall be made of test instrumentation available from the Special Flight Test Instrumentation Pool (SFTIP) at NAVAIRTESTCEN. All other required test instrumentation shall be furnished by the contractor. Instrument recording systems, including recorders and telemetry equipment, shall be compatible with the ground station equipment at all test and demonstration locations. All peculiar test instrumentation procured to satisfy this demonstration shall be labeled by incorporating "SF" as the last two characters of the item's model number. All contractor-furnished special flight test instrumentation used for the demonstration shall be made available to the Navy for the duration of follow-on T&E programs.

3.1.5.2 Installation, calibration, and maintenance. The contractor shall install, calibrate, operate, maintain, and repair all aircraft instrumentation used in performing the demonstrations. All instrumentation shall be installed in accordance with normal aircraft procedures and guidelines as approved by the Test Authority. All

transducers shall be properly located, properly damped, have flat frequency response characteristics commensurate with the frequencies of excitation of the variable to be measured, and be properly mounted to assure valid measurements and freedom from extraneous excitations. Errors resulting from time delays or phase shifts between measured parameters shall be commensurate with the accuracy requirements of the test program and shall be documented for contractor-installed instrumentation. To the maximum extent possible, end-to-end calibrations of all parameters shall be made through the aircraft instrumentation system to at least the maximum range of excitation expected during the course of the demonstration. Calibration may be performed by transducer substitution techniques for those transducers for which an accurate substitution model exists; however, this method is allowed only when an actual end-to-end calibration cannot be performed. Transferred laboratory calibrations shall be unacceptable, except in those cases in which the actual end-to-end calibration or transducer substitution methods are determined to be impossible or impractical. The proposed methods for instrument calibration shall be approved by the Test Authority. Calibration test data shall be obtained and recorded during both increasing and decreasing values of the parameter which the instrument is intended to measure. Files provided to the ground stations for calibration and format descriptions shall be compatible with the existing installation. After completion of the instrumentation installation, an EMC/EMI Safety-Of-Flight Test (SOFT) shall be conducted on the instrumentation prior to flight.

All strain gage installations shall be installed to minimize interactions or "cross-talk" during combined loadings. Interactions which do exist shall be properly accounted for during the calibration. Calibration procedures shall include compensation for temperature effects. Strain gage installations that cannot be calibrated may be used only if it can be shown, prior to installation, that the computed loads from such installation are meaningful and useful and that the methods of gage application, load calculations from gage output, gage factor, and physical constraints of the member are acceptable to the Test Authority.

3.1.5.3 Check-calibrations. Check-calibrations of all contractor-installed instrumentation shall be performed or witnessed by the Test Authority before the demonstration. Instrumentation system static and dynamic response checks shall be made through the recording system/telemetry transmitters and ground station equipment. Where such check-calibrations show significant departures from previous calibrations, a complete recalibration shall be performed.

3.1.5.4 Re-calibrations. Demonstration instrumentation shall be re-calibrated whenever a transducer is changed or repaired, when the data appears incorrect or questionable as determined by the Test Authority, when the check-calibration identifies a significant deviation, and at the conclusion of the demonstration. The results of all re-calibration for each of the demonstration aircraft shall be reported as revisions to the calibration appendices of the Demonstration Instrumentation Report.

3.1.5.5 Acceptance and witnessing procedures. The Test Authority will formally accept all instrumentation system installations for each demonstration aircraft at the location at which the demonstration tests are to be performed. Inspection of the instrumentation may be performed

at the contractor's facility or other designated location, before delivery of the aircraft at the test location. During or before the foregoing acceptance of instrumentation installations, the Test Authority will witness contractor calibrations of the complete instrumentation system. All instrumentation installations and calibrations will be witnessed by representatives of the Test Authority. Acceptance shall be based on the following:

a. Installation.

1. Acceptable workmanship and proper location and mounting of all instruments and related systems.

2. No deleterious effects on measurement accuracy and data reduction in the signal conditioning equipment.

3. The equipment has been evaluated to ensure that it will operate satisfactorily in the expected environment.

4. Instrumentation recording systems, including magnetic tape recorders and telemetry equipment are compatible with ground station equipment at all designated test and demonstration locations.

b. Calibrations.

1. Valid calibration standards are used.

2. Calibrations are repeatable.

3. The instruments have no adverse hysteresis effects.

4. Each instrument is calibrated to at least the maximum value of the parameter expected to be obtained during the demonstration.

3.1.6 Contractor's flight operations. Contractor flight operations shall be conducted in accordance with NAVAIRINST 3710.1. This includes internal procedures, qualifications, and proficiency of pilots, crew members and ground personnel. Anthropometric restrictions of NAVAIRINST 3710.9 shall apply to contractor pilots.

3.1.6.1 Prerequisites for first flight. Prior to first flight the contractor shall have:

a. Completed static test conditions required by the Aircraft Weapon Systems Engineering Design Examinations Addendum to at least 150 percent of the design limit load for the conditions to be flown. For cases where loads are not well predicted or well controlled in flight, static test to ultimate load shall be performed.

b. Performed the structural dynamic tests (such as, flutter model wind tunnel tests, compliance tests and ground vibration modal tests).

c. Performed the flight control system ground survey.

d. Performed the propulsion system ground survey.

e. Performed fire detection system tests in accordance with MIL-F-7872 or MIL-F-23447.

f. Demonstrated that safe egress from the aircraft will be practicable in event of an in-flight emergency.

g. Performed a safety assessment and an EMC/EMI Safety-Of-Flight Test (SOFT).

h. Submitted the following in accordance with the CDRL:

1. The initial aeroelastic stability analyses report, flutter model wind tunnel test report(s), compliance test data results, and ground vibration modal test results.

2. Estimated flying qualities.

3. The results of the flight control system ground survey.

4. The results of the propulsion system ground survey.

5. The results of the fire detection system tests.

6. Weight and balance data as specified by MIL-W-25140.

7. The results of the safety assessment.

8. The Demonstration, Planning and Progress Report.

i. Received approval of the following in accordance with the CDRL:

1. The Demonstration Program Plan.

2. The Demonstration Instrumentation Report.

3. The Flight Operations and Flight Plan.

j. Performed external Electromagnetic Environment (EME) analyses in and around the flight test area.

k. Made suitable arrangements for flight monitoring.

l. Obtained inspection and acceptance of the aircraft (form DD-250).

m. Obtained a flight clearance in accordance with NAVAIRINST 13034.1.

3.1.6.2 Release for flight and operating limits. Flight authorization shall be requested in accordance with the flight clearance procedures defined in NAVAIRINST 13034.1. Flight release may be denied if safety of flight is not substantiated. Prior to release for flight, the contractor shall prepare flight plans covering tests and demonstrations, procedures, and planned operating limits to be followed

by the flight test crew. After initial approval and release for flight, flight plans need not be resubmitted for additional flights if operating limits or other criteria upon which the approval was based remain valid. Operating limits shall not exceed any of the following:

a. Those authorized by the acquiring activity or its designated representative.

b. Those which the contractor has determined to be safe based on, but not limited to, the following:

1. Results of analyses of the whole aircraft and its component parts from the aerodynamic, aeroelastic stability, structural, and functional viewpoints.

2. Status of completion of tests which may, by this specification or the documents listed herein, be required to be completed as a prerequisite for certain flights.

3. Review of observations and data recorded during prior flights which have been reduced and extrapolated to the maximum extent practicable. The Test Authority may waive reduction and extrapolation of the recorded data when reduction and extrapolation of the data are not necessary for safety prior to further flight testing. Any waivers to expedite flight testing shall not negate other provisions of this specification relating to submittal of data.

c. Those for which an ultimate factor of safety of 1.5 has been demonstrated by tests and analyses accepted by the procuring activity. In the event that such tests have not been performed, the operating limits permitted shall not be more critical than those for which a factor of safety of 2.0 for metallic structure and 3.0 for composite material structure has been substantiated by analyses approved by the acquiring activity.

3.1.6.3 Normal flight limits. Normally, the initial flight authorization by the acquiring activity will be to the limits of "normal flying" which, for demonstration purposes, shall mean that:

a. Normal takeoffs and landings are authorized.

b. Flying in a normal attitude is authorized with the following limitations:

1. A normal load factor of 2 shall not be exceeded.

2. An angle of bank of 60 degrees shall not be exceeded.

3. Flight controls, engine controls, and other systems, innovations, or appurtenances shall not be moved or operated so as to result in rapid or abrupt aircraft responses.

4. The speed at any altitude shall not exceed either 1.1 times the maximum speed attainable in sustained level flight at that altitude with maximum continuous power or thrust, or 0.75 times the minimum critical flutter speed at that altitude, or 0.75 times the design limit speed (V_L) at that altitude, whichever is less. The minimum critical flutter speed for this purpose shall be that determined by analyses or data accepted by the acquiring activity.

3.1.6.4 Flight equipment. Standard Navy flight gear and related equipment shall be utilized for the tests and demonstrations required herein, wherever possible. Where contractor developed flight equipment is required, it shall be provided and used by the contractor and be made available for use by Navy personnel during DT-II evaluations.

3.2 Structural demonstration.

3.2.1 Tests and demonstration. The structural demonstration program shall consist of structural buildup tests and a formal structural flight and ground demonstration. These tests shall also include structural dynamic flight tests to ensure that the aircraft, with and without stores, is free from flutter, divergence, and other aeroelastic instabilities, structurally damaging vibrations/aeroacoustics, and excessive vibration at crew and passenger stations throughout the flight envelope.

3.2.2 Aircraft configuration. The aircraft to be used for the demonstration tests shall be identical to the production aircraft in all structural and aerodynamic aspects and shall be designated by the acquiring activity. After release of the aircraft for testing, no replacements, alterations, changes or adjustments other than those required by normal maintenance shall be made. When substantial changes that affect either the structure, aerodynamics, or the structural integrity are made by the contractor, the Structural Demonstration Test Plan shall be modified for the demonstration aircraft or provisions made in the plan to test a subsequent instrumented and calibrated aircraft. Any change shall require approval from the acquiring activity.

3.2.2.1 Gross weights. The test conditions specified for the structural flight demonstration shall be attained at the Basic Flight Design Gross Weight (BFDGW), Maximum Flight Design Gross Weight (MFDGW), or other critical gross weights from Minimum Flight Weight to MFDGW. Proposed alternate gross weight shall be submitted to the acquiring activity via the Test Authority. Alternate gross weights may be proposed provided that:

a. The load factors and magnitude and distribution of weight are such that all parts of the aircraft will be loaded at least as critically as if the tests were made at the specified gross weights and center-of-gravity positions.

b. The products of load factor times gross weight are not lower than those specified herein.

3.2.3 Flight test instrumentation. Instrumentation shall be as defined in the Demonstration Instrumentation Report. Instrumentation shall be adequate to measure the parameters required for the structural demonstration tests specified herein. The location of the instrumentation shall permit correlation between the flight and laboratory tests. Local strain instrumentation shall be provided to permit correlation between flight test, static test, and fatigue test articles. All structural instrumentation shall measure loads and responses in the identical coordinate reference system as the contractor load analyses.

3.2.3.1 Structural flight loads instrumentation. Instrumentation shall be provided to measure a minimum of 3 wing spanwise stations on the left wing (root, fold, mid) and at least the wing root on the right wing for determining distribution of bending moment, chordwise moment, vertical shear, chordwise shear, and torsion. Instrumentation shall be provided to measure forward and aft fuselage vertical and lateral shear loads and bending moments. Instrumentation shall be provided to measure horizontal and vertical stabilizer bending, shear, and torsion loads. Instrumentation shall be provided for load and/or hinge moment measurements including, but not limited to: landing gear doors, weapon bay doors, auxiliary lift and drag devices including speed brakes, flaps and slats, control surfaces and devices including vectored thrust, external and internal store/carriage including store to pylon and pylon to wing or aircraft structure interfaces, retraction and extension devices, engine mounts, refueling probe, engine duct pressures and fuel pressures. Instrumentation shall be provided for temperature measurements of those areas of the airframe subjected to temperatures which might adversely affect their structural characteristics. Accelerometers shall be located to permit determination of inertial load distributions for correlation with static and dynamic loads. Local strain instrumentation shall be provided at critical structural locations where load instrumentation is not applicable. All instrumentation required for the structural fatigue monitoring system shall be provided on the test aircraft. Instrumentation shall include pilot control input and force, control surface response, aircraft attitudes, accelerations, and velocities, both angular and translational about all aircraft axes.

3.2.3.2 Taxi, takeoff and landing test instrumentation. Instrumentation shall be provided to measure the following:

a. Landing gear loads in three axes and the corresponding shock strut stroke.

b. Arresting hook and damper, launch bar, and holdback fitting axial loads, side loads, bending moments, torque, and angular positions in two axes.

c. Internal and external store interface and pylon/wing or aircraft structure interface loads and internal extension and retraction device(s) loads. In addition, measurement of the translational and rotational accelerations of the store are required.

d. Engine loads.

e. Pilot control inputs and control surface positions.

f. Loads required in paragraph 3.2.3.1 if structural design is governed by ground load conditions.

g. Wing folding, locking and stowage mechanism loads.

h. Aircraft center-of-gravity load factors, Nx, Ny, Nz, aircraft weight, roll rate, sink speed, and engaging speed into arresting gear.

i. Landing gear rotational speeds.

j. Landing gear axle accelerations in three axes.

k. Acceleration in three axes for aircraft center-of-gravity, pilot's seats and other locations as required for comparison of test data with analytical predictions.

l. Strains at critical locations.

3.2.3.3 Structural instrumentation calibration. Calibration procedures used for the structural load instrumentation shall utilize techniques established by NACA reports and NASA for zone load methods. All structural load instrumentation shall be calibrated to 100 percent of design limit load. Calibration procedures for the structural load instrumentation shall be defined in the Demonstration Instrumentation Report.

3.2.4 Contractor demonstration requirements. The structural demonstration program shall consist of:

a. 80 percent and 100 percent buildup tests to characterize the aircraft loads, kinematics, and surface position relationships and to verify the basic aircraft design load analyses for both critical design conditions and load trends. This testing shall include:

   1. Load survey of aircraft structures tests.

   2. Structural flight limitation tests.

   3. Store release structural load survey tests.

   4. Taxi, takeoff and landing tests.

b. A formal structural flight and ground loads demonstration of all the critical loading conditions throughout the design flight envelope and design carrier suitability/landing envelope required by the detail specification.

3.2.4.1 Flight test build-up program. The 80 percent and 100 percent load survey and flight limitation tests shall be conducted prior to the formal structural flight demonstration tests and shall include the tests specified in paragraph 3.2.4.1.1, 3.2.4.1.2, and 3.2.4.1.3. Critical combinations of gross weight, center-of-gravity position, altitude, speed, load factor, Mach number, cockpit control displacement, and control surface authority shall be tested. Maneuver methodology shall be in accordance with the design maneuvers of MIL-A-8861, however, where load trends indicate critical conditions within the flight and maneuver envelopes, additional surveys shall be performed to ensure identification of critical load conditions and structural deficiencies.

3.2.4.1.1 Flight tests for load survey of airframe structure. The 80 percent and 100 percent flight loads survey shall include all critical variations of gross weight, center-of-gravity, store configuration, aerodynamic configuration including flaps, slats and speed limiting devices, pilot control inputs, both abrupt and steady, and thrust vectoring and shall be investigated in accordance with Table IA as specified herein. The tests shall include the clean aircraft configuration and the most critical store configuration for Table IA. Other store and/or aircraft configurations shall be surveyed as determined from load trends established from the clean and critical store survey required by Table IA. Other store configurations may be required to determine the critical store configuration. All configurations to be tested shall be approved by the acquiring activity. Prior to 100 percent testing, the results of the 80 percent tests shall be submitted to the acquiring activity for approval.

3.2.4.1.2 Structural flight limitations tests. Structural flight limitations tests shall be conducted for the clean aircraft configuration, and the three most critical store configuration(s) (if applicable). The tests shall be conducted in accordance with Table IB as follows:

a. The tests of Table IB shall be performed at:

   1. The basic flight design gross weight which includes the stores specified in the detail specification for the critical stores configuration.

   2. The maximum aft center-of-gravity position with the landing gear retracted, including the growth factor specified in the detail specification.

   3. The maximum forward center-of-gravity position with the landing gear retracted, including the growth factor specified in the detail specification.

b. The variation of maximum dynamic normal force coefficient with Mach number tests shall be performed in accordance with Table IB as specified herein. The contractor shall select and submit to the acquiring activity for approval, critical combinations of loading, configuration, gross weight, and center-of-gravity position for the demonstration of Test "a" of Table IB. The tests shall be performed at an altitude not greater than 20,000 feet, with engine(s) operating at that thrust which will result

TABLE IA. Flight tests for load survey structures.

1 Test	2 Structure	3 Critical loading	4 Maneuvers	5 Remarks
a	Wing Root	Bending and torsion (positive and negative)	Symmetric (steady & abrupt) Pull-ups Push-overs Asymmetric (abrupt) Rolling pull-outs Rolls Directional (steady) and abrupt) maneuvers Translational (abrupt) maneuvers (if applicable)	The load survey data shall be obtained for all of the maneuvers specified in column 4 at a minimum of 6 altitudes and a minimum of 10 Mach numbers at each altitude. The altitudes and airspeeds selected shall be sufficient to ensure the attainment of the critical loading to an accuracy of 5% throughout the full speed, load factor envelope specified in the detail specifications which encompasses the maximum loadings of column 3 for the airframe components specified in column 2. Additional increments shall be included to ensure that no new critical conditions exist for the airframe. The method for performing the maneuvers defined in column 4 shall be in accordance with the design maneuvers of MIL-A-8861.
	Outer panel	Bending (positive & negative) Torsion		
	Fold joint (if applicable)	Bending Torsion		
	Leading edge extension (if applicable)	Torsion Wing attachments		
b	Fuselage Forward Center	Bending (positive & negative)		
	Aft	Bending (positive & negative) Torsion		
c	Empennage Horizontal	Bending (positive & negative) Hinge moment Panel loads		
	Vertical	Bending (positive & negative) Panel loads Torsion		
d	Control surfaces Rudder, Elevator Lateral Controls - Flaps LE & TE	 Hinge moments Hinge moments Hinge moments		
e	External store stations	Critical for fuselage wing and wing store station		
f	Other components as may be unique to the designs and amplified by this specification.			

TABLE IB. Structural flight limitations tests.

1 Test	2 Name	3 Load factor	4 Speed to be attained in combination with required load factor	5 Pressure altitude	6 Special requirements
a	PHAA & recovery	At least n_{max}	$V = \sqrt{\frac{2 n_z W}{\rho_0 K C_{NAmax} S}}$ Where: V = Speed for the test, knots n_z = Design limit load factor W = Weight of the airplane specified for the test, pounds S = Surface area, sq. ft. ρ_0 = Air density, slugs/cu. ft. C_{NAmax} = Maximum dynamic normal force coefficient as determined for the C_{NAmax} vs M data K = 1.25 for M = 0.6 K = 1.0 for M = 1.0 K = (1.625 - .625 M) for 0.6 to 1.0M (The above values for K are the specified design values.) NOTE: K C_{NAmax} shall be determined over the Mach number range expected for this test.	No greater than 7500 ft.	For airplanes having bomb-bay doors, these test shall be performed with the bomb-bay doors open. These tests shall be performed so as to develop: (1) The specified load factor at speed not greater than the specified speed or alternatively, (2) The specified load factor at the minimum speed at which the load factor can be developed in a symetrical pull-out in a vertical plane by applying maximum longitudinal-control force (see definitions) in not more than 0.5 second and maintaining that force until the maximum attainable load factor has been reached. If the results of developmental flights indicate that attainment of the specified conditions by (1), above, is not possible and that compliance with the procedure of (2), above, would result in exceeding the limit strength of the airplane, the contractor, by means of analyses, wind-tunnel tests, and/or flight tests, shall determine the design changes needed to permit attainment of the specified conditions with the procedure of (2), above, shall install the changes, and shall demonstrate the specified conditions. Recovery shall be made by applying maximum longitudinal-control force in the opposite direction until maximum up-stabilizer load has been attained consistent with safe recovery procedures.

TABLE IB. Structural flight limitations tests - Continued.

1 Test	2 Name	3 Load factor	4 Speed to be attained in combination with required load factor	5 Pressure altitude	6 Special requirements
b	Landing equipment operation	Optional	Maximum attainable as limited by effectiveness of operating system, safe flying qualities, or limit strength of structure or system, whichever is most critical.	Optional	Perform tests for each of the following items: (1) Extend landing gear. (2) Flight with landing gear fully extended. (3) Extend high lift devices. (4) Flight with high lift devices fully extended. (5) Operation of the sliding portions of cockpit enclosures unless operation of sliding portions in flight is limited by design requirements to only emergencies (separately and collectively if such operation is possible.) (6) Operation of any other devices that are used for landing or in the landing approach.
c	Landing configuration pull-out	at least 2.0	Not lower than the maximum EAS for V_{LF} as specified in MIL-A-8860.	Optional	Develop specified load factor and speed in the landing approach configuration.
d	Scramble take-off	Optional	As specified in column 6.	As specified in column 6.	Perform take-off with airplane in field take-off configuration, maintaining combat power from start of run until test is completed without use of speed-reduction devices. Actuate, in proper sequence all cockpit controls for retracting, closing or repositioning landing gears, high-lift devices, pilot enclosures, and any other appurtenances that retract, close, or go into different positions during transition from take-off to the climb configuration, and record history of relative positions of each appurtenance with equivalent airspeed until each reaches final position for climb. The altitude shall not exceed 200 feet above the runway surface until the best-climb airspeed is reached. Repeat the test: for carrier-type (Continued on next page)

TABLE 1B. Structural flight limitations tests - Continued.

1 Test	2 Name	3 Load factor	4 Speed to be attained in combination with required load factor	5 Pressure altitude	6 Special requirements
					(Continued from previous page) airplanes in catapult take-off configuration if different from field take-off configuration.
e	One engine out	As specified in column 6	As specified in column 6	(1) Not greater than 7500 ft. and also (2) within 2000 ft. at which v_{MRT} or v_{MAT} (as applicable) with full-combat-thrust at combat weight is attained.	For multi-engine airplanes, only, with one engine not operating. At each required altitude attain (1) greater of all-engines-operating v_{MRT} or v_{MAT} (as applicable) or maximum-safe speed at test altitude with no specified pull-out load factor and (2) symmetrical pull-out to greater of 2.25 or maximum-safe load factor at speed not less than all engines operating v_{MRT} or v_{MAT} (as applicable) at test altitudes.

in the maximum dynamic normal force coefficient, but not exceeding maximum continuous, and under the following conditions:

1. The aircraft shall be at a speed not less than 20 knots above the stalling speed and shall be trimmed for zero control forces for unity load factor. The speed shall be decreased at a rate not to exceed one knot per second, holding the wings laterally level until a fully developed stall is attained. A fully developed stall is attained when the aircraft has developed full post stall motions and the control stick has been moved and held to the full aft position.

2. The aircraft shall be at a speed greater than the speed required for Test "a" of Table IB and shall be trimmed for zero control forces for level flight. The aircraft shall enter a windup turn and perform an accelerated stall at a load factor of at least 0.95 n_{zmax}.

3. The aircraft shall perform at least two additional accelerated stalls as described in subparagraph 1. above, except that the speeds shall be incremental Mach numbers between the stalling speeds of subparagraphs 1. and 2. above, with corresponding incremental load factors.

3.2.4.1.3 Store release structural load survey. A store release structural load survey shall be performed for all critical store release conditions. This shall include both airframe critical loads and adjacent store critical loads. The survey shall be performed using a buildup approach to the maximum release load factor. The aircraft gross weight shall be the critical design gross weight as defined in the detail specification. Testing shall be performed at the critical center-of-gravity and aircraft configuration. Stores shall be released during symmetrical pull-up conditions.

3.2.4.1.4 Engine operation during tests. Tests shall be performed with maximum continuous power (or thrust) and RPM of the power plant(s), except for multi-engine aircraft where Test "e" of Table IB shall be performed with one engine inoperative. The engine selected to be inoperative for Test "e" shall be approved by the Test Authority. Engine operation for V/STOL aircraft shall be the maximum vectored thrust required to attain maximum performance. During transitional operation, the vectored thrust shall be distributed to obtain maximum translational velocity in minimum transition time. Maximum differential thrust shall be used for V/STOL tests requiring asymmetric thrust.

3.2.4.1.5 Operation of flight control systems. The influence of each control system (as applicable) on control surface movements (authority) and aircraft flight characteristics shall be determined during the structural flight tests. These systems are:

a. Systems operating independently of pilot control which can move the control surfaces independently either by design for their intended use or because of malfunction, e.g. aerodynamic slats, autopilot. The Test Authority shall determine, for each of the

demonstration tests specified, whether the system is to be engaged or disengaged during the test.

b. Systems dependent on pilot control.

1. Direct systems (including boosted systems) in which maximum displacements attainable may be limited by normal stops in the control system or limited by the airloads which exceed the maximum control system output. Subject to approval by the Test Authority, these maximum control displacements may be substituted for the control forces specified for the demonstration tests of Table IC.

2. Stability augmented systems where the pilot input does not directly establish the control surface(s) position(s), i.e., control surface authority of fly-by-wire, hand-oriented, computer, and active controls.

3. Translational control systems where the pilot input provides translational changes to altitude and sidewise directions, i.e., vectored-thrust, direct-lift control, and direct-side-force control through means other than the conventional control surface displacements.

3.2.4.1.5.1 Trim. All tests shall be performed with the aircraft trimmed for a control force within 10 pounds of zero for each control in steady wings laterally level flight at the speed specified for the test. The tolerance "within 10 pounds of" is authorized to eliminate unnecessarily precise trimming during structural demonstration tests. However, such a tolerance does not justify any deviation from flying qualities design requirements. For aircraft having stability augmentation control systems, no lateral trim tolerance will be permitted for symmetrical maneuvers.

3.2.4.1.5.2 Maximum control authority. Subject to approval of the Test Authority, the maximum control authority attainable, as limited by normal stops or avionic limits in the control systems, may be substituted for the control forces specified for the tests and demonstrations.

3.2.4.1.6 Operation of appurtenances. During buildup flights, appurtenances which can be put into continuous motion (such as rotation of radar antenna), which can be extended or rotated to different positions (such as an extensible radar antenna or rotating bomb-bay door), or which can be suddenly extended and suddenly retracted (such as an extensible rocket launcher), shall be operated sufficiently to determine, by a combination of test data and calculations, the effects on aircraft loads and motions up to the V-n limits required for structural design of the particular item. This determination shall be discussed fully in the Demonstration Planning and Progress Report. The acquiring activity will select the positions and/or motions of appurtenances required for structural flight limitation tests if such positions and motions are not specified in Table IB. During and immediately after each flight performed during structural limitation tests, the satisfactory operation of appurtenances subjected to high loads shall be demonstrated.

TABLE IC. Structural demonstration tests.

1 Test	2 Name	3 Speed	4 Altitude	5 Load factor	6 CG	7 Remarks
a	PHAA	Critical	Critical	n_{max}	Critical	Steady and abrupt
b	Low altitude PLAA					
c	High altitude PLAA					
d	Transonic pull-out					
e	Low speed rolling pull-out			.8 n_{max}		Load factor for fighter and attack type = n_{max}. Load factor in column 5 is at maneuver initiation.
f	High speed rolling pull-out					Load factor for fighter and attack type = n_{max}. Load factor in column 5 is at maneuver initiation.
g	Rolls			Critical		Both 1g and -1g for Fighter and/or Attack Aircraft.
h	Pushover			n_{max}		
i	Sideslips			Optional		Both steady and abrupt at critical low and high airspeed.
j	Rudder reversal					
k	Scramble		Sea level			As specified for test d in Table IB.
l	One-engine out		Critical			

TABLE IC. Structural demonstration tests - Continued.

1 Test	2 Name	3 Speed	4 Altitude	5 Load factor	6 CG	7 Remarks
m	Transitional maneuvers (as applicable)	Critical	Critical	Critical N_Y or N_Z	Critical	Maximum pilot control input to provide specified displacement in the vertical or sidewise directions to achieve the specified N_Y and/or N_Z.
n	Flight control system malfunctions			Critical		For airplanes equipped with SAS or fly by wire computer controlled flight control systems, the maximum safe limits shall be demonstrated with one control systems inoperative. The selection of the failed system shall be made by the Test Authority.
o	Get home					For airplanes equipped with SAS or fly by wire computer controlled flight control system and a manual back-up system the maximum safe limits shall be demonstrated with only the manual system operative.
p	Low speed pullup and roll					Takeoff and landing

NOTE:

1. The aircraft configurations to be used for these tests shall be the clean configuration and the critical stores configuration(s) (if applicable).

3.2.4.2 Formal structural flight and ground demonstrations. Formal flight and ground demonstrations shall be conducted following the analysis and approval of the structural flight and ground buildup data and following the Structural Flight Demonstration Planning and the Structural Ground Loads and Carrier Suitability Demonstration Planning Conferences. Prior to release of the aircraft for the formal structural demonstrations of Tables IC, IIA or IIB, the data resulting from the 80 percent and 100 percent flight and ground buildup tests shall be included in the Demonstration Planning and Progress Reports and the Demonstration Report. Specific conditions and parameters to be demonstrated shall be recommended. Aircraft designated for the demonstration shall be given an in-depth structural inspection prior to the demonstration. Additional periodic structural inspections shall be performed following tests where critical load factors are experienced. A final in-depth inspection shall be performed following completion of the demonstrations.

3.2.4.2.1 Structural flight demonstration. The maneuvers specified in Table IC or as modified at the Structural Flight Demonstration Planning Conference shall be performed. A single aircraft shall be used for the dives and pull-ups. Pilot control input/maneuver method shall be in accordance with MIL-A-8861 or as determined during the structural buildup tests, whichever results in the maximum/critical loads.

3.2.4.2.1.1 Structural dynamic flight demonstration. The structural dynamic flight test program shall be performed in accordance with MIL-A-8870.

3.2.4.2.1.1.1 Aeroelastic stability flight tests. Aeroelastic stability flight tests shall be performed in accordance with the requirements of MIL-A-8870, concurrent with flight envelope expansion up to design limit speeds. Aeroelastic stability flight tests shall be performed for the clean configuration and ten additional configurations selected from the primary mission configuration, alternate mission(s) configuration(s), and other store(s) configuration(s). The configurations shall be approved by the procuring activity. Prior to authorization to proceed with aeroelastic stability flight testing and flight speed envelope expansion, the prerequisite supporting test results and documentation required by the applicable Aircraft Weapon Systems Engineering Design Examinations Addendum shall have been submitted in accordance with the CDRL including:

a. Intermediate Aeroelastic Analysis Report.

b. Flutter Model Wind Tunnel Test Report(s).

c. Flutter Compliance Data Report.

d. Ground Vibration Modal Test Report(s).

e. Thermoelastic Test Report.

f. Rigidity Test Report.

TABLE IIA. Field landing tests.

1	2	3	4	5	6
Test	Type of airplane	Sinking speed (FPS)	Horizontal speed (knots)	Pitch attitude degrees	Roll angle degrees
a	Carrier based	10	$1.05V_{PAmin}$	Tail down -3	Optional
b				Mean ±1.5	
c				Three point +3	
d		5		Optional	Not less than 5
e	Land-based trainer	17		Tail down -3	Optional
f				Mean ± 1.5	
g				Three Point +3	
h		8.5		Optional	Not less than 5
i	Land-based except land-based trainer	10		Tail Down -3	Optional
j				Mean ±1.5	
k				Three point +3	
l		5		Optional	
m					Not less than 5

NOTES:

1. The pitch attitudes for tail down and three point are defined in MIL-A-8863; the mean attitude is as defined in MIL-A-8863.
2. Tolerances for pitch and roll-attitudes are ±1 degree.
3. Tolerances for horizontal speeds are ±10 knots.

TABLE IIB. Field carrier landing practice tests.

1 Test	2 Sinking speed	3 Horizontal speed	4 Pitch altitude	5 Roll altitude	6 Remarks
a	.0885 V_A + 6.1 FPS	V_A ± 15 KTS	Not greater than mean − 4.5 deg	Optional	Perform once to the conditions specified or alternatively 3 times but with sinking speed not less than 0.8 times the specified.
b			Not less than mean + 4.5 degrees		Perform once to the conditions specified or alternatively 3 times but with sinking speed not less than 0.8 times the specified.
c			Mean plus or minus 3 degrees		Perform once to the conditions specified or alternatively 3 times but with sinking speed not less than 0.8 times the specified.
d	.0885 V_A + 3 FPS		Optional	7 degrees	
e	.0885 V_A			Optional	Yaw angle not less than 6 degrees.

NOTE: Symbols of this table are defined in MIL-A-8863.

3.2.4.2.1.1.2 Vibration flight tests. Vibration flight tests shall be performed in accordance with MIL-A-8870. These tests shall include instrumented external fuel tanks and missiles to determine the vibration response environments.

3.2.4.2.1.1.3 Aeroacoustic ground and flight tests. Aeroacoustic ground and flight tests shall be performed in accordance with MIL-A-8870. The aeroacoustic ground tests shall be completed prior to accrual of 50 flight hours on any flight test aircraft.

3.2.4.2.1.1.4 Service life effects on control surfaces, tabs, and wingfolds. Freeplay measurements and rigidity tests shall be performed on all control surfaces, tabs and wingfolds on three flight test aircraft in accordance with MIL-A-8870. Records shall be maintained on these aircraft to track any deterioration in freeplay and rotational stiffness or replacement of any component or associated parts during the flight test and demonstration program.

3.2.4.2.2 Taxi, takeoff and landing tests. Weight distribution, including ballast to attain the specified gross weight and center-of-gravity positions shall be approved by the acquiring activity. Runway roughness and unprepared field conditions shall be as specified in the detail specification.

3.2.4.2.2.1 Field taxi, field takeoff and field landing tests. Taxiing, (including turning, braking, and pivoting) and takeoff tests shall be performed at selected gross weights and critical loading configurations up to the maximum design gross weight. The field landing tests of Table IIA shall be performed at the landplane landing design gross weight and at selected critical loading configurations. The total number of configurations to be tested shall not be less than three. At least one configuration shall be tested with the aircraft rolling over and impacting the cable of a field emergency arresting gear.

3.2.4.2.2.2 Field Carrier Landing Practice (FCLP) tests. The landing tests of Table IIB shall be performed at the weight for which strength is required for FCLP landings. The total number of configurations to be tested for each test shall not be less than three. The landings tests of Table IIB shall be performed on dry and repeated on wet concrete surfaces.

3.2.4.2.2.3 Field emergency arresting gear. Compatibility with standard configured field emergency arresting gear shall be demonstrated. The ability of the arresting hook to engage and retain the arresting gear cross deck pendant shall be demonstrated both without braking and with maximum braking with the anti-skid engaged, if applicable. The tests shall be performed at the landplane landing design gross weight specified in MIL-A-8860 at selected critical gross weights and loading configurations. The total number of configurations to be tested shall not be less than two. The engaging speeds shall be up to 1.05 V_{PAmin} + 25 knots.

3.2.4.2.2.4 Carrier suitability demonstration tests. The structural requirements for catapult launches and arrested landings are specified in paragraph 3.6.

3.3 Aerodynamic demonstration tests.

3.3.1 Flight test program. An aerodynamic flight test program shall be conducted to demonstrate flying qualities and performance, natural and artificial stall warning, loss-of-control characteristics, and recovery techniques.

3.3.2 Aircraft configuration.

3.3.2.1 Flight test vehicle. Except as discussed in "Emergency recovery devices," "Inverted fuel/oil systems," "Instrumentation," and "On-board cameras," the flight test vehicle shall be representative of the production aircraft in all significant respects.

3.3.2.2 Classification. Aircraft shall be placed in a class as specified in MIL-F-8785. When operational missions and design capabilities indicate, an aircraft of one class shall be required to meet selected demonstration requirements ordinarily specified for aircraft of another class. The most stringent demonstration requirements shall apply whenever an aircraft fails to come clearly within one of two possible classes.

3.3.2.3 Gross weight and c.g. positions. The maximum aft and maximum forward c.g. positions shall be the positions that can be obtained with any service loading combination attainable as specified in MIL-W-25140. The gross weight for a c.g. position shall approximate the service loading that would occur with the c.g. position. Where neither the weight nor the c.g. is specified, the expected c.g. positions for service use of the aircraft shall be used.

3.3.2.4 Emergency recovery device. Until approach to stall and spinning characteristics of the aircraft have been determined, no spins shall be made without an approved emergency recovery device installed and ready for use. The emergency recovery device shall be installed within the normal contour of the aircraft, if at all practicable, and shall in no case be installed in a manner so as to increase the effective fin area of the aircraft and shall not significantly change aircraft aerodynamics, inertia, or c.g. position. The contractor shall advise the acquiring activity promptly if a determination is made that the installation of the emergency recovery device within the normal contour of the aircraft is not practicable. If the emergency recovery device is not installed within the normal contour of the aircraft, spins performed with the device installed shall be repeated with an aerodynamic production configured aircraft. However, a requirement to validate departure or spin in a production configured aircraft will be contingent upon test results that indicate spin demonstrations can be safely conducted without the emergency recovery device installed. Approval of the emergency recovery device installation shall be obtained from the Test Authority and, prior to commencement of high AOA and spin tests, successful operation of the device shall be demonstrated, under controlled conditions, to at least an airspeed equivalent to the predicted maximum airspeed in a steady state spin.

3.3.2.5 Inverted fuel/oil systems. The flight test vehicle shall have inverted fuel/oil systems capable of sustaining engine operation for at least 60 seconds at Intermediate Rated Thrust and, if applicable, 15 seconds at Maximum Afterburner Thrust. This applies to both single and dual engine aircraft configurations.

3.3.3 Flight test instrumentation. The contractor shall provide onboard instrumentation in accordance with the Demonstration Instrumentation Report. When very high angular rates are anticipated, variable range or additional rate gyros may be required to provide adequate resolution for the prestall and post stall conditions. The frequency response of the instrumentation shall be adequate to measure high frequency phenomena such as prestall buffet. Except when actuated during emergency situations, flight test auxiliary hydraulic and electrical systems shall not restrict the mission time of the test aircraft. An emergency electrical power source shall be provided to ensure that loss of telemetry during high AOA testing will not occur. Actuation of the auxiliary electrical power system shall not interrupt data acquisition. The telemetry system shall be capable of transmitting data on a minimum acceptable set of critical parameters and provide audio communication capability between the airplane and ground station. Additional instrumentation shall be provided for structural purposes when predictive studies or initial flight test results indicate that the airframe or store suspension equipment may experience stall/post stall loads near or above design values. To ensure compliance with the flight demonstration test requirements as specified in paragraph 3.3.4.2, an error analysis shall be provided to verify the adequacy of the proposed instrumentation.

3.3.3.1 Cockpit instrumentation and layout. Cockpit displays in the test vehicle, particularly instruments indicating airspeed, altitude, AOA, turn/slip, normal acceleration, stall warning, attitude reference, and engine parameters shall be those types to be installed on the production aircraft. When special AOA, sideslip, and yaw rate indicators are provided, they shall be easily readable and compatible in operation with production indicators (e.g., dials turning in the same direction). Either a specially designed negative pilot restraint system shall be provided or the production pilot restraint system shall have been successfully tested on the NAVAIRDEVCEN centrifuge prior to conduct of high AOA buildup or demonstration testing. A production pilot restraint system which has not been tested on the centrifuge shall be used only after sufficient flight test results are available to indicate that crew station angular rates and accelerations will not incapacitate or greatly hinder the pilot during application of recovery controls.

3.3.3.2 Onboard cameras. Forward looking cameras, both cockpit and external, shall be employed to document aircraft motions. These cameras shall operate at 24 frames per second to allow true-time film reviews. An adequate film supply shall be provided to insure representative documentation during each test mission. Onboard cameras, that serve as an integral part of the quantitative data acquisition system may operate at any appropriate frame rate. A cockpit video camera shall be installed with provisions for time tagging the video tape with the data acquisition system. Unless otherwise suitably instrumented, the emergency recovery system shall be covered by an onboard camera operating at an appropriate

frame rate. Externally mounted cameras shall be located to minimize effects on airplane aerodynamics.

3.3.4 Contractor demonstration requirements.

3.3.4.1 Flight test build-up program. A purposeful, milestone approach to high AOA flight test shall be conducted to demonstrate compliance with the detail specification requirements and obtain suitable information for the Flight Manual. Resistance to departure from controlled flight and prevention of departures shall be given the same attention as that directed toward recovery from Post-Stall Gyration (PSG) and spins. A concurrent objective of this demonstration is the reporting of detailed information for inclusion in the Emergency and Flight Characteristics sections of the aircraft Flight Manual. A flight test build-up program consisting of a flight simulation program and a flight verification program shall precede the formal demonstration of high AOA and spin characteristics and Flying Qualities and Performance (FQ&P). The objective is to achieve an accurate definition of the aircraft aerodynamics, flight control system, store loadings, gross weight, center-of-gravity, and inertias as a function of AOA, sideslip, Mach number, attitude, body axis rates, and rotation rate. This shall include low AOA departure resistance testing at AOAs between 0 and 15 degrees and high AOA hang-up testing. The objective and the maneuvers that shall be performed are listed in Table IIIA.

3.3.4.1.1 Flight simulation program. Prior to flight testing for the buildup program, a computer analysis/ground based flight simulation shall be conducted to:

a. Determine the high AOA characteristics.

b. Investigate the full spectrum of possible maneuvers and control inputs under all flight conditions.

c. Establish those maneuvers and control inputs that are not possible to flight test with a reasonable degree of safety.

d. Evaluate coupling effects to establish critical control inputs and body rate combinations.

e. Produce an initial flight test plan.

This simulation effort, where feasible, should include pilot-in-the-loop and should incorporate the effects of rotary derivatives obtained from wind tunnel testing.

3.3.4.1.2 Flight test verification program. Flight tests shall be performed to verify the analysis/flight simulation results. The general guidelines for buildup maneuvers are listed in Table IIIA. Once a satisfactory level of correlation has been achieved, the flight test program should proceed to establish, in safe increments, the most critical parameters. During the flight verification program, the flight results shall be used to continually update the analysis/flight simulation data base, ensure flight safety, and make efficient use of flight time.

TABLE IIIA. High angle of attack build-up tests.

1	2	3	4
Test	Name	Flight altitude	Description
a	High angle of attack investigation (gear up)	Erect	Determine: a. Buffet onset b. Buffet characteristics (build-up in buffet intensity, moderate buffet, limit buffet, maximum tracking buffet) c. Pitch control limit d. Approach to stall characteristics e. Stall/departure resistance f. Post stall/departure gyrations g. Incipient spin characteristics h. Spin characteristics i. Spin recovery characteristics j. Control effectiveness in fully developed spin k. Effects of misapplied recovery controls in fully developed spin l. Effects of aerodynamic surface deflection in fully developed spin (canards, speedbrakes, etc.) m. Effect of failure of artificial out-of-control warning systems or special flight control law modes on spin recovery. Fully developed 5 turns erect (3 turns inverted) spin shall be demonstrated holding critical pro-spin controls.
b		Vertical	
c		Inverted	
d	High angle of attack investigation (gear down)	Erect	Same as above except terminate investigation when post stall/ departure motions develop into the incipient spin phase.

NOTE: The high angle of attack build-up and demonstration tests shall include the effects of:

- Thrust level
- SAS/CAS
- Degraded orders in FCS
- Stores configuration (symmetric and asymmetric)
- Speedbrake
- Maneuver devices
- Center of gravity
- Altitude
- Inertia
- Failed aero surfaces (flight controls, flaps/slats, etc.)
- Transonic deceleration at elevated g

TABLE IIIA. High angle of attack build-up tests - Continued.

1	2	3	4	5
Test	Name	Flight attitude	Angle of attack	Description
e	Aggravated input	Erect	1G Trim α to max AOA or $+N_{z\,limit}$ whichever is less	Building up in AOA and Mach to limiting conditions, perform the following full control step inputs at each AOA: a. Lateral b. Lateral and aft c. Lateral and forward d. Lateral and rudder (coordinated) e. Lateral, rudder and aft (coordinated) f. Lateral, rudder and forward (coordinated) g. Lateral and opposite rudder (cross controls) h. Lateral, opposite rudder and aft (cross controls) i. Lateral, opposite rudder and forward (cross controls) j. Rudder control k. Aft control l. Forward control Above max stablized AOA, transient AOAs shall be investigated building-up from smooth to abrupt longitudinal inputs.
		Vertical	As required	
		Inverted	1G Trim α min AOA or $-N_{z\,limit}$ whichever is greater.	
		Erect	1G Trim α to max AOA or $+N_{z\,limit}$ whichever is less.	Same as above except simulate engine failure during each of the above maneuvers and simulate engine failure at each Mach and angle of attack test condition with controls neutral. Since throttle movement during post-stall gyrations or spins may be detrimental to the engine operation, the throttles shall be positioned prior to maneuver entry for power or asymmetric thrust effects.
		Vertical	As required	
		Inverted	-1G Trim α to α min or $-N_{z\,limit}$ whichever is greater.	

TABLE IIIA. High angle of attack build-up tests - Continued.

1	2	3	4	5
Test	Name	Flight attitude	Angle of attack	Description
f	Coupling (kinematic and inertia)	Erect	1G Trim α to max AOA or $+N_{Z\,limit}$ whichever is less.	Repeat all 2 and 3 axis aggravated control input maneuvers, phasing control inputs as rates peak about the first axis. Establish max roll rate and apply the following full control inputs: (use lateral control input for c. through h. and roll with rudder for l. through n. a. Forward b. Aft c. Rudder with d. Rudder against e. Forward and rudder with f. Forward and rudder against g. Aft and rudder with h. Aft and rudder against i. Lateral with j. Lateral against k. Forward and lateral with l. Forward and lateral against m. Aft and lateral with n. Aft and lateral against Establish max yaw rate and apply the following full control inputs: a. Forward b. Aft c. Lateral with d. Lateral against e. Forward and lateral with f. Forward and lateral against g. Aft and lateral with h. Aft and lateral against Establish max nose down pitch rate and apply the following full control inputs: a. Lateral b. Rudder c. Lateral and rudder (coordinated) d. Lateral and rudder (cross control) Establish max nose up pitch rate and apply the same.
		Vertical	As required	
		Inverted	-1G Trim α to α min or $-N_{Z\,limit}$ whichever is greater.	

3.3.4.2 Flight demonstration tests. The flight demonstration shall consist of Flying Qualities and Performance (FQ&P), high AOA, and spin tests.

3.3.4.2.1 Performance tests. The performance guarantee items specified in the detail specification shall be demonstrated.

3.3.4.2.1.1 Drag measurements. With the approval of the acquiring activity, certain of the requirements of 3.3.4.2.1 may be satisfied by mathematical formulation using flight data for the variation of drag coefficient with lift coefficient and installed engine performance at subsonic, transonic and supersonic Mach numbers, as applicable. These inflight aerodynamic and thrust measurements shall be combined with applicable aircraft weight, center-of-gravity, and fuel volume to calculate conformance with the performance guarantees specified in the detail specification. Performance data requirements proposed for submittal by this method shall be specified in the Performance Data Reduction Report along with the detailed procedure to be used.

3.3.4.2.2 High AOA flight test variables. Tolerances for critical parameters used to determine acceptability of demonstration maneuvers such as Mach number, AOA, normal acceleration, and altitude shall be established by mutual agreement between the contractor and the acquiring activity prior to performance of the demonstration tests.

3.3.4.2.3 Natural stall warning. The demonstration shall establish if natural stall warning meets the requirements of MIL-F-8785 as specified in the detail specification.

3.3.4.2.4 Artificial stall warning. When installed, artificial stall warning shall be demonstrated to meet the requirements of MIL-F-8785 as specified in the detail specification. The flight test shall demonstrate that:

a. The output from tactile stall warning devices, such as stick or rudder pedal shakers, is not masked by airframe buffet or flight control system dynamics and is readily discernible with the body in any normally anticipated position.

b. Visual stall warning devices are readily discernible near peripheral vision limits, for any normally anticipated head position, during day or night operation.

c. Aural, stall warning signals are easily distinguishable from gear, flap, and other malfunction tones or other aural signals and do not block voice communication channels.

3.3.4.2.5 Natural loss-of-control warning. The effectiveness of natural loss-of-control warning or indication shall be demonstrated.

3.3.4.2.6 Artificial loss-of-control warning. If artificial loss-of-control warning or indication is provided, it shall be demonstrated to be effective in allowing the pilot to prevent departure.

3.3.4.2.7 Artificial loss-of-control prevention system. When a loss-of-control prevention device is required by the detail specification, it shall be demonstrated that the device effectively prevents departures under critical combinations of test parameters and maneuvering circumstances.

3.3.4.3 Specific test requirements. After completion of the buildup program, the final critical demonstration conditions for the Flying Qualifies and Performance (FQ&P) and high AOA and spin demonstration shall be recommended by the contractor at the High AOA and Spin Demonstration Conference. The final critical points to be demonstrated are as listed in Tables IIIB and IIIC respectively. Approval of the flight test program shall be obtained from the acquiring activity prior to the start of the formal demonstration.

3.3.4.3.1 Out-of-control recovery procedure. When an aircraft is subject to departure from controlled flight while performing the high AOA flight test, the out-of-control recovery procedure shall be demonstrated. Such a recovery procedure should not require the pilot to determine the nature or the direction of the post-stall motion in order to properly execute the recovery steps. Other recovery procedures shall be recommended, as required, for an aggravated departure, deep stall condition, erect spin, or inverted out-of-control events. The altitude loss values, associated with the out-of-control events, shall also be determined and compared to simulation predictions. It shall be determined if the aircraft is subject to any appreciable recovery-inhibiting effects.

3.3.4.3.2 Spin recovery-Class I and IV aircraft. When a departure from controlled flight or a deliberate spin attempt results in a spin while performing the high AOA flight tests, a satisfactory spin recovery technique shall be demonstrated. Turns for recovery shall not exceed those specified in MIL-F-8785. Under normal application circumstances, the recovery procedure should not subject the aircraft to spin reversals or a change of spin mode that prolongs recovery. The spin recovery procedure shall be compatible with the out-of-control recovery procedure with a minimum of changes or additions. Accomplishment of the recovery procedure should not be compromised by accelerations at the crew station. Control forces shall not exceed those values specified in MIL-F-8785. For Class IV aircraft, with fly-by-wire and advanced cockpit displays, the following demonstration requirements apply:

a. Engagement/disengagement thresholds of manual automatic spin recovery flight control modes shall not inhibit or prevent recovery from out-of-control flight conditions.

b. Cockpit displays shall always present correct information to the pilot for recovery from out-of-control flight conditions. Spin recovery procedures shall have a minimum of changes or additions for all configurations and loadings, including asymmetric external store loadings.

TABLE IIIB. Flying qualities demonstration tests.

Test	Name	A/C config	Store config	Gross weight	C.G.	Speed	Altitude (feet)	Thrust	Description
a(1)	Static longitudinal stability	PA	Clean	LDGW	Aft limit	V_{PAmin}	h = 5000 ft msl	TLF	Longitudinal stick forces, stick positions, and control surface positions required to maintain speeds both lower and higher than trim speed shall be demonstrated. Flight path stability data shall be determined. Data shall be acquired utilizing the stabilized point technique or the accel/decel method.
a(2)			Critical						
a(3)		CR	Clean	Critical		Critical	Critical		
a(4)			Critical						
b(1)	Manuevering longitudinal stability	CR	Clean	Critical	Aft limit	Critical	Critical	As reqd	The elevator control forces, stick positions, and control surface positions versus load factor shall be acquired up to n_{zmax} utilizing steady and wind-up turns.
b(2)			Critical						
b(3)			Clean		Fwd limit				
b(4)			Critical						
c(1)	Nosewheel lift-off	TO	Clean	Critical	Critical	As reqd	Ground level	As reqd	The minimum speed at which takeoff attitude can be attained and maintained shall be demonstrated from brake release in configuration TO and from a 4 degree glideslope in configuration BO. The required control forces shall be recorded throughout the takeoff and acceleration to 1.3 V_{sto} without change in thrust, trim, gear, or flap setting. Overrotation tendencies shall also be investigated.
c(2)			Critical						
c(3)		BO	Clean	LDGW		V_{PAmin}			
c(4)			Critical						

TABLE IIIB. Flying qualities demonstration tests - Continued.

Test	Name	A/C config	Store config	Gross weight	C.G.	Speed	Altitude (feet)	Thrust	Description
d	Ground effect hold-off	L	Critical	Critical	Critical fwd	V_{PAmin}	Ground level	TNA	The minimum speed attainable in ground-effect and the stick force required to maintain the required elevator deflection at this speed.
e(1)	Longitudinal control forces in dives	CR (S/B in)	Clean	Critical	Max fwd	Critical	As reqd	As reqd	Determine the magnitude and rate of change of longitudinal control forces in dives to maximum airspeeds, and the ease with which these forces can be maintained near zero by retrimming. With airplane trimmed for level flight and without changing power, except as required to prevent exceeding V_L the airplane shall enter and maintain a 70 degree dive or a dive angle corresponding to max permissible airspeed, whichever is less, to minimum safe altitude for pullout and recovery at not less than 3g. The maximum longitudinal control force required at max airspeed shall be noted throughout the dives with and without trimmings.
e(2)		CR (S/B out)							
e(3)		CR (S/B in)	Critical						
e(4)		CR (S/B out)							
f	Trim change during wave-off	PA	Critical	Critical	Critical	V_{PAmin}	H < 1000 ft AGL	TNA	With the airplane trimmed on a 4 degree glideslope in configuration PA, perform the change to configuration WO and maintain the original approach angle-of-attrack. The longitudinal control force required to maintain this AOA shall be shown.

TABLE IIIB. Flying qualities demonstration tests - Continued.

Test	Name	A/C config	Store config	Gross weight	C.G.	Speed	Altitude (feet)	Thrust	Description
g(1)	Speed brake effectiveness	CR	Critical	Critical	Critical	Critical	Critical	Critical	Investigate effectiveness of speed brakes. Determine elevator force required to maintain same point of aim and the normal acceleration Objectional trim changes, buffet, or other characteristics should be noted.
g(2)			Clean			V_H	25,000 ft	IRT	Determine the time required to decelerate the airplane from maximum level flight airspeed (V_H) at the specified power setting to a speed 80% of that speed using the deceleration devices(s). Engine thrust shall be reduced from IRT to a level which IRT can be obtained in not more than 5 seconds.
g(3)						250 KIAS		Idle	As the specified airspeed, the time of descent shall be demonstrated on an on-course descent from 25,000 ft to 5,000 ft with throttle at idle.
h(1)	Dynamic longitudinal stability	CR	Clean	Critical	Aft limit	Critical	Critical	As reqd	Determine short period frequency and damping as well as longitudinal acceleration sensitivity (n_z/α). Utilize both longitudinal stick doublets as well as stick raps (pulses). Long period characteristics shall also be determined for configurations CR and PA.
h(2)			Critical						
h(3)		PA	Clean				h = 5000 ft msl		
h(4)			Critical						

TABLE IIIB. Flying qualities demonstration tests - Continued.

Test	Name	A/C config	Store config	Gross weight	C.G.	Speed	Altitude (feet)	Thrust	Description
h(5)		CT	Clean	Critical	Aft limit	Critical	h = 5000 ft msl	As reqd	
h(6)			Critical						
i(1)	Pilot-induced oscillations	PA	Critical	Critical	Critical	Critical	Critical	Critical	The contractor shall fly the airplane in flight conditions where PIO tendencies about all axes are predicted. High workload mission tasks shall be flown to expose PIO tendencies. Accumulate sufficient flight test data to determine whether a tendency exists for divergent or uncontrollable oscillations to occur from pilot inputs during high pilot workload situations. Sinusoidal control inputs shall be utilized for tests i(1) and i(2) to determine if PIO tendencies exist. The critical tanker shall be used for in-flight refueling.
i(2)		CR							
i(3)	In-flight refueling	PA				As reqd	As reqd	As reqd	
i(4)		CR							
i(5)	Air-to-air tracking								
i(6)	Air-to-ground tracking								
i(7)	Lateral offset landings	PA							
i(8)	Formation flying	CR	Clean			Critical	Critical		
j(1)	Static lateral-directional stability	PA	Clean	Critical	Critical	Critical	h = 5000 ft msl	As reqd	Determine the rudder position, rudder force, aileron position, aileron force, bank angle, and sideslip up to full rudder pedal application or aileron limit using steady heading sideslips.
j(2)			Critical						
j(3)		CR	Clean				Critical		

TABLE IIIB. Flying qualities demonstration tests - Continued.

Test	Name	A/C config	Store config	Gross weight	C.G.	Speed	Altitude (feet)	Thrust	Description
j(4)		CR	Critical	Critical	Critical	Critical	Critical	As reqd	
k(1)	Dynamic lateral-directional stability	PA	Clean	Critical	Aft limit	Critical	h = 5000 ft msl		Determine the spiral mode. Determine the Dutch Roll frequency and damping utilizing the rudder doublet technique.
k(2)			Critical						
k(3)		CR	Clean				Critical		
k(4)			Critical						
l(1)	Roll performance and lateral control sensitivity	PA	Clean	Critical	Critical	V_{PAmin} -5	h = 5000 ft msl	As reqd	Determine the bank angle achievable in one second, steady state roll rate, roll mode time constant, roll rate oscillation parameter (Posc/Pavg, bank angle oscillation parameter (ϕosc/ϕavg), and sideslip excursion parameter ($A\beta_{max}/K$). Adverse/proverse yaw tendencies shall be noted. Rudder pedals shall be held fixed or free if necessary to demonstrate any of these parameters. All control forces, positions, and displacements shall be shown. In the case of asymmetric stores, the demonstration shall be performed rolling into the unloaded wing. Tests shall be performed utilizing bank to bank full lateral stick deflection rolls. Lateral control sensitivity shall also be investigated.
l(2)			Critical			TO			
l(3)			Critical asymmetric			V_{PAmax}			

TABLE IIIB. Flying qualities demonstration tests - Continued.

Test	Name	A/C config	Store config	Gross weight	C.G.	AOA	Speed	Altitude (feet)	Thrust	Description
m(1)	Roll performance and lateral control sensitivity	CR	Clean	Critical	Critical	Critical	As reqd	Low	TLF	For wings level flight, determine bank angle in one second, time to 90 degrees bank change, roll mode time constant, steady state roll rate, Posc/Pavg, ϕosc/ϕavg Aβmax/k, adverse/proverse yaw tendencies control harmony and coupling tendencies from 1g wings level, full deflection rolls and from greater than 1g flight. Lateral control sensitivity shall also be investigated. The stores configuration shall include a critical asymmetric external loading.
m(2)			Critical							
m(3)			Clean					Med		
m(4)			Critical							
m(5)			Clean					Hi		
m(6)			Critical							
n(1)	Asymmetric thrust (in-flight)	TO/CR	Critical	Critical	Critical	Critical	As reqd	h = 2000 ft AGL	Critical eng cut	Determine minimum trim airspeeds; static and dynamic minimum control airspeeds; approach, landing and waveoff flight characteristics; safety speed on takeoff; and flying qualities characteristics for long range cruise tasks with asymmetric power. No corrective action should be taken until 2 seconds after the critical engine is cut or 20 degrees of bank. The minimum airspeeds at which the airplane is safely controllable throughtout the ensuing motions and, following transients, at which the rudder and aileron are capable of holding the airplane to zero yaw and roll rates with not more than 5 degrees of bank angle shall be demonstrated.
n(2)		PA								
n(3)		WO								
n(4)		CR						Critical		
n(5)		BO								

TABLE IIIB. Flying qualities demonstration test - Continued.

Test	Name	A/C config	Store config	Gross weight	C.G.	Speed	Altitude (feet)	Thrust	Description
o	Asymmetric thrust (ground)	TO	Critical	Critical	Critical	Critical	Ground level	Critical engine cut	Determine the static and dynamic minimum control ground speeds (the dynamic tests should only be conducted if sufficient analysis and build-up tests predict an acceptable degree of safety); determine the maximum airspeed that can be accelerated to, lose an engine and still maintain control of the airplane with no more than 30ft deviation from runaway centerline. Determine dynamic abort characteristics utilizing normal abort procedures as determined by the contractor. Tests with and without nosewheel steering engaged should be conducted if applicable. No corrective action shall be taken until 1-2 seconds after the engine is cut or until 30 ft of deviation from runway centerline is exceeded, whichever occurs first and is the most critical element in the test.

TABLE IIIB. Flying qualities demonstration tests - Continued.

Test	Name	A/C config	Store config	Gross weight	C.G.	Speed	Altitude (feet)	Thrust	Description
p	Asymmetric thrust	Critical	Critical	Critical	Critical	Critical	Critical	Critical	The minimum speed for a safe descent, approach, and landing shall be demonstrated with a simulated engine seizure at altitude. Seizure may be simulated by permitting the seized engine to windmill; however, the effects of the windmilling engine on the power control system shall be eliminated by means of a cockpit control or otherwise at the time of simulated engine failure and this condition shall be maintained until the landing has been completed. Trim changes during configuration changes shall be noted.
q(1)	Asymmetric store configurations	PA	Critical asymmetry	Critical	Critical	Critical	h=10,000 ft	Critical	Determine the minimum trim and minimum safe airspeeds. Note any objectionable flying qualities characteristics.
q(2)		CR							

TABLE IIIB. Flying qualities demonstration tests - Continued.

Test	Name	A/C config	Store config	Gross weight	C.G.	Speed	Altitude (feet)	Thrust	Description
r(1)	Asymemetric movable aerodynamic surface	PA	Clean	Critical	Critical	Critical	h = 5000 ft msl	As reqd	Minimum control airspeeds and flight characteristics shall be demonstrated for critical moveable aerodynamic surface asymmetrics as well as safe decent and landing from altitude, if these asymmetrics are probable failure modes in flight control system.
r(2)			Critical						
r(3)			NOA						
r(4)		CR	Clean				Critical		
r(5)			Critical						
r(6)			NOA						
s(1)	Transonic flying qualities	CR	Clean	Critical	Critical	As reqd	As reqd	Critical	Investigate level flight accel/decel characteristics with and without speedbrakes. Stabilize at predetermined Mach numbers in transonic region and investigate: trimmability about all axes, short period characteristics, PIO tendencies, longitudinal manuevering stability, lateral-directional stability, roll performance and lateral control sensitivity. Investigate longitudinal characteristics during high g deceleration through the transonic region.
s(2)			Critical						
t(1)	Stability/control augmentation	PA	Clean	Critical	Critical	Critical	Critical	As reqd	Demonstrate the flying qualities for single axis failure of the SAS and CAS systems. Airplane controllability at the time of each failure shall also be demonstrated allowing for a pilot reaction time.
t(2)	System failures (SAS/CAS)		Critical						

(Continued on next page)

TABLE IIIB. Flying qualities demonstration tests - Continued.

Test	Name	A/C config	Store config	Gross weight	C.G.	Speed	Altitude (feet)	Thrust	Description
t(3)		CR	Clean	Critical	Critical	Critical	Critical	As reqd	(Continued from previous page) Flight control system designed to operate with both SAS and CAS on or off only, where individual operation of the SAS or CAS is not possible, shall be demonstrated with single failures of the pitch, roll, and yaw axes. In both control systems, flying qualities will also be demonstrated with SAS/CAS off.
t(4)			Critical					Critical	
u(1)	Back-up flight control systems	PA	Clean	Critical	Critical	Critical	h=1000 ft AGL	Critical	On airplanes equipped with a back-up flight control system, the flying qualities shall be demonstrated with only the back-up flight control system in operation. These tests shall include a demonstration of: a. field landing b. controllability about all axes c. recovery from unusual attitudes d. ability to control rate of climb e. ability to perform moderate roll rate bank to bank maneuvers f. ability to perform point to point navigation maneuvers.
u(2)			Critical						
u(3)		CR	Clean				Critical		
u(4)			Critical						
v(1)	Crosswind takeoffs and landings	TO	Clean	Critical	Critical	Critical	Ground level	As reqd	Determine crosswind limits for takeoffs and landing without the use of differential braking.
v(2)			Critical						
v(3)		PA	Clean						
v(4)			Critical						
v(5)			Critical asymmetric						

TABLE IIIB. Flying qualities demonstration tests - Continued.

NOTES:

(1) Critical, when it appears as the only store configuration for a given test, shall include consideration of the clean airplane as a possible configuration.

(2) From the available build-up and flight demonstration data for tests a and b, determine, where possible, the neutral and maneuvering points for both the clean and critical store loadings.

(3) Configuration CR, for the purposes of this table, refers only to gear up and flaps in normal cruise position. Power setting will be as specified in table, and will include augmented thrust if available. Critical airspeed shall include transonic and supersonic, if applicable.

(4) Configuration PA, for the purposes of this table, refers to all power approach configurations that the airplane shall fly.

(5) Configuration NOA, for the purposes of this table, refers to normal operational asymmetries expected in an operational environment.

(6) Minimum safe airspeed is the minimum airspeed that the airplane can be flown safely with pilot control forces required to maintain straight and level flight. This speed will be below minimum trim airspeed.

TABLE IIIC. High angle of attack demonstration tests.

Test	Name	Flight attitude	Mach	AOA	Stores config	C.G.	Thrust	Description
a	High angle of attack demonstrations manuevers	As reqd	Critical	Critical	Critical	Critical	Critical	The following final critical manuevers shall be demonstrated: a. Erect 1g stall (cruise and high lift configurations)* b. Erect accelerated stall (cruise and high lift configurations)* c. Inverted (-1g) stall d. Inverted accelerated stall e. Erect aggravated input departure (cruise and high lift configurations) f. Inverted aggravated input departure g. Erect coupled departure h. Vertical stall (tailslide) i. Vertical aggravated input departure j. Erect spin from 1g entry k. Erect spin from accelerated aggravated entry (cruise and high life configurations) * l. Erect spin from inertia coupled entry m. Erect spin from vertical entry n. Inverted spin from -1g entry o. Inverted spin from accelerated aggravated entry p. Inverted spin from inertia coupled entry q. Inverted spin from vertical entry r. 10 additional manuevers tailored to the mission and configuration (aerodynamic, flight angle-of-attack control systems, thrust, etc.) * Post stall gyration only is to be demonstrated

3.3.4.3.3 Engine operating characteristics. Engine operating characteristics shall be documented while performing the flight test buildup and demonstration. If engine stalls are not prevented, clear and unambiguous cockpit indications of impending or actual stall, flameout or overtemp, and identification of the malfunctioning engine(s) shall be demonstrated at high AOA/sideslip out-of-control flight conditions unless automatic stall or overtemp protection logic is incorporated in the engine control system(s). When engine malfunction occurs during high AOA flight, it shall be demonstrated that recovery from the existing or ensuing out-of-control mode(s) can be accomplished at least 10 seconds prior to the projected time at which loss of ability to position the flight controls would occur due to the engine malfunction. This requirement shall be met with the throttles remaining in the least conservative position.

3.3.4.3.4 Recovery characteristics. Recovery dynamics and maximum effort dive pullout characteristics shall be thoroughly determined. Altitude loss in out-of-control events and total recovery altitude values shall be recorded over a wide range of out-of-control maneuvers and store loading. Steep rolling maneuvers and erect and inverted spirals shall be examined to determine if these motions may appear similar to out-of-control or recovery events. When potential misinterpretation of the maneuvers can lead to improper control application, all cues to the pilot that will allow proper recognition shall be identified.

3.3.4.3.5 Training maneuvers. Flight training maneuvers, appropriate to the aircraft Class and mission, shall be identified to illustrate the high AOA flight characteristics. Inverted flight shall be included as required. The procedures for performing these maneuvers shall be clearly defined so service pilots can safely practice the maneuvers. Specific guidelines concerning the type of training maneuvers may also be provided by the acquiring activity.

3.3.4.3.6 Baseline stability and control tests. When it is anticipated that special modifications may significantly alter the basic properties of the test aircraft, high AOA, longitudinal, and lateral-directional stability and control flight tests shall be conducted early in the demonstration program, within the established safe limits. Test results shall be compared with similar data from a production configured aircraft. Specific guidelines concerning the types and conditions for stability and control flight tests to be performed may also be provided by the acquiring activity.

3.3.4.3.7 Qualitative spin description. Spin mode modifiers for qualitative description of a spin are listed in Table IV.

3.4 Propulsion system demonstration.

3.4.1 Propulsion system tests. None of the tests specified herein shall be construed to require operation of the aircraft under conditions which would exceed safe operating limits established in the flight clearance issued by the acquiring activity. The propulsion system demonstration does not necessarily require a dedicated aircraft. If other demonstration aircraft have the necessary instrumentation installed, propulsion system demonstration tests can be "piggy backed" on other tests. The definition of power is contained in section 6.

TABLE IV. Spin mode modifiers.

Sense	Attitude	Rate	Oscillations
Erect	Extremely steep	Slow	Smooth
Inverted	Steep	Fast	Mildly oscillatory
	Flat	Extremely rapid	Oscillatory
			High oscillatory
			Violently oscillatory

3.4.2 Aircraft configuration. Except for the instrumentation, the flight test vehicle shall be representative of the production aircraft in all significant respects. Both the engine and accessories, such as fuel control and afterburner, shall be the model proposed for the production aircraft. The airframe/engine installation, including inlet ducts, shall be that proposed for the production aircraft. If the aircraft to be demonstrated includes an automatic or manually variable inlet geometry system, the equipment shall be functioning throughout the demonstration program.

3.4.3 Flight test instrumentation. Instrumentation shall be provided in accordance with the Demonstration Instrumentation Report.

3.4.3.1 Turbojet/turbofan engines. Instrumentation shall be provided to measure thrust using a calibrated thrustmeter or by measurement of the change in momentum of the air passing through the engine. Static and total pressure at the compressor inlet and total pressure at the turbine outlet shall be measured. Engines installed in carrier aircraft, where there is a possibility of steam ingestion from the catapult and/or exhaust gas ingestion from the jet blast deflector, shall have instrumentation installed necessary to detect induced compressor instabilities. If an automatic or manually controlled variable inlet geometry system is installed, instrumentation shall be provided to indicate and record the geometry position during all operations.

3.4.3.2 Turboprop and turboshaft engines. Instrumentation shall consist of a torquemeter to measure power and the necessary instrumentation to determine thrust by measuring the change in momentum of the air passing through the engine at the same time. Static and total pressure at the compressor inlet and total pressure at the turbine outlet shall be measured.

3.4.3.3 Rocket, ram-jet, and pulse-jet engines. Rated thrust output shall be measured using a calibrated thrustmeter.

3.4.3.4 Propeller driven aircraft. Suitable instrumentation shall be provided to collect vibration and stress data on the propeller as installed on the engine.

3.4.4 Contractor demonstration requirements. The propulsion system demonstration shall consist of:

a. Buildup tests to characterize the airframe/propulsion installation.

b. A formal ground and flight demonstration to determine the performance characteristics of the installed engine.

3.4.4.1 Build-up test program. Prior to commencement of the formal propulsion systems demonstration, a build-up program shall be conducted consisting of a vibration survey, a installation temperature survey, a compressor inlet and turbine outlet pressure survey, and a propeller vibration survey (for propeller driven aircraft).

3.4.4.1.1 Engine vibration survey. Flight and ground tests shall be conducted to collect vibration data on the engine installation and substantiate a satisfactory installation. Vibration data shall be provided to the engine manufacturer for use in determining if vibrations of the airframe and engine combination affect the engine. The survey shall include an evaluation of the structural integrity of the engine, drive train (if applicable), and the airframe. Structural fatigue of the prime load paths to and through the engine, and vibration characteristics of the engine and its installation at frequencies corresponding to each forcing frequency shall be determined. Although the prime contractor shall be responsible for the collection and submittal of all engine vibration survey data, the engine manufacturer may participate in the determination of instrumentation and test procedures to be used for this survey. Analyses of the data for specification compliance, with proof-of-design of airframe, installation components, and engine components shall be prepared by the airframe and engine manufacturers respectively. Release for first flight and for DT-II shall be contingent on satisfactory ground and flight vibration surveys respectively. Engine stress measurements, if required, shall be recorded during the vibration survey(s).

3.4.4.1.2 Engine installation temperature survey. Ground and flight tests shall be performed in accordance with MIL-C-8678 to demonstrate that the engine installation meets the specified temperature limitations.

3.4.4.1.3 Compressor inlet and turbine outlet pressure survey. On turbojet, turbofan, turboshaft, and turboprop engine installations, a static and total pressure survey at the compressor inlet shall be performed. A total pressure survey at the turbine outlet shall be performed. These surveys shall be made throughout the maneuvering envelope of the aircraft to define distorted flow conditions. Inlet air pressure variation shall be determined in accordance with MIL-E-5007 at each of the test point conditions and compared to the recommended values in the engine model specification. If the measured values exceed the engine model specification maximum tolerable values, this discrepancy shall be reported to the acquiring activity.

3.4.4.1.4 Propeller vibration survey. For propeller driven aircraft, ground and flight tests shall be conducted in accordance with the vibratory stress survey requirements of MIL-P-26366. The aircraft manufacturer shall provide the necessary equipment and personnel for data collection. The propeller manufacturer will prepare the required data on the propeller-stress survey. If the propeller-vibration-stress survey indicates unsatisfactory vibration stresses in the propeller, the acquiring activity will place the responsibility for correction of this condition in each specific case, and the tests shall be repeated to demonstrate correction of the unsatisfactory characteristics.

3.4.4.2 Propulsion system ground and flight demonstrations. Formal ground and flight demonstrations shall be scheduled following the analysis and approval of the data from the buildup test program. These demonstrations shall consist of:

a. Demonstration of engine characteristics during ground operation.

b. Demonstration of engine characteristics in flight.

c. Engine power output runs.

d. Military power runs.

e. Propeller operation (if applicable).

f. Fuel system demonstration.

3.4.4.2.1 Demonstration of engine characteristics during ground operation. During ground demonstrations, the power output and thrust measurements specified for the applicable tests of paragraph 3.4.4.2.3 shall be recorded. It shall also be demonstrated that the thrust available at idle RPM does not cause excessive taxi speeds. For augmented engines, the following measurements shall also be obtained.

a. Fuel manifold pressure.

b. Fuel flow.

c. Fuel pump discharge pressure.

3.4.4.2.1.1 Starting characteristics. Measurements shall be recorded at intervals of 0.1 seconds for all starts except cross starts where intervals not to exceed 0.2 seconds are acceptable. On engine control systems which utilize digital inputs and outputs, the data recording shall be consistent with the system update rate; however, the update rate shall be greater than 10 measurements per second. The following data shall be recorded for starting characteristics:

a. Time.

b. Engine speed.

c. Engine temperature.

d. Starter voltage.

e. Starter current.

f. Power source(s) voltage.

g. Power source(s) current.

The following starts shall be performed:

a. For automatic control systems, three starts shall be made in accordance with the engine manufacturer's starting procedure. On multi-engine aircraft, the three starts need only be made on the engine(s) on one side except that all engines shall be started at least once.

b. If an emergency control system (manual or electrical) is provided, two starts shall be made on the control in accordance with the engine manufacturer's specified procedure. On multi-engine aircraft, two starts need be made only on the engine(s) on one side.

c. If a cross starting capability is provided, two starts on the second engine shall be conducted using the aircraft DC generator(s) or converter(s) power assisted by the aircraft battery(ies).

3.4.4.2.1.2 Steady state characteristics. When lever settings on the primary control and on the manual (emergency) control are provided, tests of the lever setting shall be performed for turbojet, turbofan, turboprop and turboshaft engines at:

a. Idle.

b. 50 percent intermediate thrust/power.

c. 65 percent intermediate thrust/power.

d. 90 percent intermediate thrust/power.

e. 100 percent intermediate thrust/power.

f. 100 percent intermediate thrust/power to maximum thrust/power if applicable.

g. Minimum booster engine power.

h. Maximum booster engine power.

Measurements shall be recorded at five second intervals. Tests shall be of four minutes duration after reaching the specified power ratings at each control lever setting. A minimum of five measurements, to determine control system transients, shall be recorded for the first minute of each test after reaching the specified power ratings.

3.4.4.2.1.3 Acceleration characteristics. Slow, intermediate and snap accelerations and decelerations shall be performed with the primary control. Slow and intermediate accelerations and decelerations shall be performed whenever a manual (emergency) control is provided. The following accelerations, where applicable, shall be performed over the following ranges for turbojet, turbofan, high-bypass fan, turboprop and turboshaft engines:

a. Power approach to intermediate thrust/power.

b. Power approach to maximum thrust/power.

c. Idle to 100 percent intermediate thrust/power.

d. Idle to maximum thrust/power.

e. Maximum continuous to maximum power (A/B).

f. Intermediate to maximum thrust/power.

g. Minimum afterburner (A/B) thrust to maximum thrust.

h. Minimum booster engine power to maximum booster engine power.

i. Throttle bodies (decel-accel) at the most critical conditions.

On multi-engine aircraft, tests are required for the engine(s) on one side. The test shall be performed by starting with slow acceleration and deceleration rates, then increasing to an intermediate rate, and then increasing to a snap rate (idle to intermediate throttle advancement in one second). The snap accelerations should be conducted in steps from engine idle to intermediate thrust and compared to the engine simulation model used for APC and ACLS system development. The steps should vary in size from approximately 200 lbs up to a value limited by the intermediate or idle steps. The steps should be initiated at approximately 10 different thrust levels over the idle to intermediate thrust range. Snap rate need not be performed with the manual control in tests d., e., f., g., and h. Parameter measurements shall be recorded at 0.1 second intervals, except on engine control systems that utilize digital inputs and outputs less than 0.1 second. In such cases, the data recording shall be consistent with the system update rate. A minimum of 10 measurements shall be recorded to show control system transients for each acceleration and deceleration.

3.4.4.2.1.4 Noise level measurements.

3.4.4.2.1.4.1 Turboprops/turboshaft. With all engines operating at military rating, noise level measurements shall be taken on the ground on one side of the aircraft at 30 degree intervals on 25, 50, 100, and 200 foot radii, from lines originating at the centerline of the aircraft in the plane of the propeller. Test instrumentation shall be as listed in the Demonstration Instrumentation Report.

3.4.4.2.1.4.2 Turbojet/turbofan. With all engines operating at maximum power, noise level measurements shall be taken at 12.5, 25, 50, 100, 200 and 400 feet radii centered at the nozzle, or midway between nozzles of the tail pipes in intervals of 30 degrees around the aircraft. Test instrumentation shall be as listed in the Demonstration Instrumentation Report.

3.4.4.2.2 Demonstration of engine characteristics in flight. Measurements shall be recorded at five second intervals during the tests for accelerations and decelerations and afterburner operation. A minimum of 20 sets of measurements (or sufficient data to show control system transients) for military power runs shall be recorded on one engine during the tests for acceleration, deceleration, and afterburner operation for demonstration of altitude power control performance. For augmented engines, the following data shall also be recorded:

a. Fuel manifold pressure.

b. Fuel flow.

c. Fuel pump discharge pressure.

3.4.4.2.2.1 Constant Mach number climbs. Three climbs shall be performed at three different power lever settings, including intermediate thrust and maximum afterburning, at three different Mach numbers. Nine climbs shall be performed from 2,000 feet pressure altitude to the combat ceiling for each of the Mach number power lever setting combinations selected. Where maximum aircraft Mach number is not achievable at 2,000 feet, additional constant Mach number climbs at maximum power shall be performed at speeds increasing in 0.05 Mach number increments throughout the envelope of the aircraft. The climbs shall be initiated at minimum allowable altitude for the particular speed and terminated at maximum power combat ceiling.

3.4.4.2.2.2 Altitude idle schedule at low airspeeds. A low speed descent from service ceiling to 2,000 feet pressure altitude with power lever in idle position (flight idle for turbojets and turboprops) shall be performed. A level deceleration from max Mach to minimum airspeed for 1.0g level flight shall be performed with the power lever in the idle position to demonstrate proper operation of the Mach-Idle airflow schedule. These decelerations shall be performed at two altitudes that allow for high Mach number operation.

3.4.4.2.2.3 Accelerations and decelerations. Measurements recorded at no greater than 0.25 second intervals shall be made for slow, intermediate, and snap accelerations and decelerations from 10,000 feet pressure altitude to military power service ceiling in 10,000 foot increments for tests a. through e. below. Data shall be recorded during the stabilization period to document engine and control system transients. The flight parameters to be held constant during the stabilization period shall be specified in the Propulsion System Demonstration Test Plan. The following tests shall be performed:

a. Idle to 100 percent intermediate power or thrust (all engines).

b. Idle to maximum power (afterburner) (turbojet and turbofan engines).

c. Intermediate to maximum thrust (afterburner) (turbojet and turbofan engines).

d. Minimum afterburner thrust to maximum thrust (turbojet and turbofan engines).

e. One acceleration and one deceleration of the booster engine from minimum rated thrust to full thrust at main engine, military power service ceiling (throttle movement during acceleration and deceleration shall be compatible with engine limitations).

f. A simulated wave-off, from power approach thrust to intermediate thrust, shall be demonstrated and recorded at a pressure altitude of 5,000 feet.

g. Takeoff thrust transient shall be demonstrated by performing a snap acceleration from idle to military power on an engine that was operated for 15 minutes at idle power at sea level static conditions prior to the power advance.

A soak time of not less than 15 seconds for turbojet, turbofan and turboprop engines, shall precede the power lever movement for acceleration tests. A minimum of 10 measurements (or sufficient data to show system transients) shall be recorded on one engine during each acceleration and deceleration test conducted during military power runs. Following acceleration and deceleration, the engine power setting shall be retained until the engine has stabilized.

3.4.4.2.2.4 Engine stall checks. Engine stall checks shall be performed from 10,000 feet pressure altitude to military service ceiling in 10,000 foot increments. Five engine stall checks at each altitude shall be made by performing "bodie" and "reverse bodie" throttle transients at anticipated minimum stall conditions. Prior to these tests, the engine shall be stabilized at the condition(s) that provide the most adverse engine operating state for engine stall margin. The five stall checks at each altitude should be performed at evenly spaced intervals of airspeed from V_{min} to V_{max}. Stall checks shall also be made at the maximum allowable sideslip angles for assessment of inlet distortion effects. If electronic fuel control system stall protection logic (active and inactive) is utilized, this system shall be demonstrated.

3.4.4.2.2.5 Emergency protection. When an emergency control (manual or electrical) is provided, switchovers from primary control to emergency control shall be demonstrated during normal rated thrust or power level flight runs at 10,000 feet intervals from 10,000 foot altitude to service ceiling (on one engine on multiple engine aircraft).

3.4.4.2.2.6 Afterburner operation. When an afterburner or similar power augmentation is provided, afterburner light-off shall be demonstrated at minimum sustaining airspeeds for successful engine re-light at altitudes from 10,000 feet to the critical operational altitude of the engine, as defined by the engine specification, in 10,000 foot increments. Flame retention of the afterburner shall be demonstrated to the maximum engine altitude as installed in the aircraft. Minimum afterburner operation shall be demonstrated from minimum sustaining airspeed to the aircraft engine(s) afterburner combat ceiling. Minimum afterburner operation at minimum sustaining airspeed shall be demonstrated at the maximum altitude where this can be demonstrated.

3.4.4.2.2.7 Operation with gun, rocket, and missile firing. Satisfactory engine operation during gun, rocket, and guided missile firings shall be demonstrated.

3.4.4.2.2.8 Anti-icing and de-icing. Satisfactory operation of the engine ice protection system shall be demonstrated. The capability of the engine air induction system to maintain maximum airflow with no ice ingestion shall be demonstrated throughout the airspeed/altitude envelope.

3.4.4.2.2.9 Air starts. Three satisfactory air starts on one engine shall be demonstrated at the maximum altitude and minimum speed, corrected for installation, as specified in the engine specification. The maximum altitude at which air starts can be made shall be determined. Air starts shall be demonstrated with manual (emergency) controls, if provided.

3.4.4.2.2.10 Flame damping. Satisfactory flame damping shall be demonstrated in accordance with the test procedure of MIL-D-6728. All phases of flame damping effectiveness shall be reported, with particular emphasis on hazards of night landing approach and takeoffs for both land and shipboard operations.

3.4.4.2.2.11 Engine performance monitoring system. The functional capabilities specified in the "Engine Condition Monitoring" requirement of MIL-E-5007 shall be demonstrated. In-flight Engine Condition Monitoring System (IECMS) software shall be demonstrated by ground simulation and during actual flight operations. The level of accuracy and effectiveness of all system maintenance indications, engine component life usage tracking, engine performance degradation trending, and takeoff thrust check indication shall be demonstrated. The IECMS data transfer and interface with the required data processing ground station shall be demonstrated.

3.4.4.2.3 Engine power output tests. Engine power output tests shall be performed to determine any power discrepancies and provide accurate information on power output.

3.4.4.2.3.1 Turboprop and turboshaft engines. The intermediate-rated equivalent shaft horsepower and maximum power, when applicable, developed by the engine in level flight at an altitude of approximately 5,000 feet and service ceiling shall be determined. This shall not exceed either intermediate rated RPM (maximum continuous if no intermediate rating assigned) or top index temperature (the temperature, turbine inlet or tail pipe, for which the applicable power and RPM is the maximum permissible). The power shall be measured by a torquemeter. The thrust shall be determined by measurement of change in momentum of the air passing through the engine at the same time. Measurements of Turbine Inlet Temperature (TIT) and Tailpipe (TPT) Temperatures shall be verified by fuel air ratio combustion temperature calculations. Provision for measuring turbine inlet temperature will be furnished by the engine manufacturer.

3.4.4.2.3.2 Turbojet/turbofan engines. The thrust output developed by turbojet or turbofan engines in level flight shall be determined at five altitudes within the flight envelope of the aircraft for maximum continuous, intermediate, and maximum power settings as specified by the engine manufacturer. The range of altitudes shall include minimum safe altitude, maximum attainable service ceiling for each of the above power settings, and maximum attainable combat ceiling for each of the above power settings. The range of speeds shall include minimum and maximum speeds attainable in level flight at the combat ceiling altitudes for each of the above power settings. The thrust shall be obtained by measurement of change in momentum of the air passing through the engine, or by use of a calibrated thrustmeter.

3.4.4.2.3.3 Rocket engines. The rated thrust output shall be determined under conditions (e.g., temperatures, fuel pressures) on which power output is based, in level flight at an altitude of approximately 35,000 feet. When direct thrust determination cannot be made, the engine manufacturer's "Thrust vs Chamber Pressure" curves shall be used to determine thrust.

3.4.4.2.3.4 Ram-jet and pulse-jet engines. The rated thrust output shall be determined under applicable conditions (e.g., temperatures, fuel pressures, altitudes) on which power output is based in level flight. The thrust shall be obtained by the use of a calibrated thrustmeter or an alternate method approved by the acquiring activity for the specific application.

3.4.4.2.3.5 Combination power plants. On aircraft where combinations of the above engines are installed, the power or thrust shall be determined on each type of engine in accordance with the procedures specified herein for each type engine.

3.4.4.2.4 Military power runs. Military runs shall be performed under the conditions specified for each type engine. Maximum continuous power shall be used for military power runs when a military rating is not assigned. High power time limitations shall be established when applicable.

3.4.4.2.4.1 Turboprop and turboshaft engines. A total of one hour of intermediate power operation in periods of not less than 15 minutes shall be accumulated with the total time equally divided among the following:

a. Level flight below 5,000 feet.

b. Level flight at cruise ceiling.

c. Climb at airspeed for maximum rate of climb.

Aircraft configuration and data for each of the tests shall be recorded and shall include the following as applicable:

a. Condition of loading.

b. Weight at start of flight.

c. Fuel and oil on board at start of flight.

d. Fuel and oil on board at end of flight.

e. Kind of fuel and oil used.

f. Propeller details, such as design, number of blades, pitch setting, constant speed, controllable pitch, etc.

g. At five-minute intervals during the run:

1. Standard pressure altitude.

2. RAM (Total) air temperature at above altitude.

3. Airspeed indicator reading.

4. Engine RPM.

5. Tail pipe total gas temperature.

6. Oil pressure.

7. Engine oil inlet and outlet temperatures.

8. Rear bearing temperature.

9. Fuel manifold pressure.

10. Fuel flow.

11. Air flow.

12. Tail pipe total pressure.

13. Compressor inlet total temperature.

14. Compressor inlet total pressure.

15. Exhaust nozzle position.

16. Torquemeter reading.

17. Temperature of primary structural members subjected to temperatures greater than 200 degrees F.

18. Main fuel pump inlet pressure.

19. Main fuel pump discharge pressure.

20. Emergency fuel pump discharge pressure.

21. Turbine inlet temperature.

22. Compressor discharge pressure.

23. Engine control lever position.

24. Propeller blade angle.

25. Input signal to propeller control.

26. Main reduction gear box oil inlet and outlet temperatures.

27. Combining gearbox inlet and outlet oil temperatures (if applicable).

28. Time.

29. Weather conditions.

3.4.4.2.4.2 Turbojet and turbofan engines. A total of one hour of intermediate power operation in periods of not less than 15 minutes shall be accumulated with the total time equally divided among the following:

a. Level flight below 5,000 feet.

b. Level flight at cruise ceiling.

c. Climb at airspeed for maximum rate of climb.

An additional 15 minutes of continuous operation shall be performed at maximum cruise ceiling attainable with military power. (This period may be reduced in duration to maximum allowable continuous operation if that is less than 15 minutes.) Aircraft configuration and data for each of the tests shall be recorded and shall include the following, as applicable:

a. Condition of loading.

b. Weight at start of flight.

c. Fuel and oil on board at start of flight.

d. Fuel and oil on board at end of flight.

e. Kind of fuel and oil used.

f. At five minute intervals during the run:

1. Standard pressure altitude.

2. Air temperature at the above altitude.

3. Airspeed indicator reading.

4. Engine RPM.

5. Turbine inlet or turbine outlet total gas temperature.

6. Oil pressure.

7. Engine oil inlet and outlet temperatures.

8. Rear bearing temperature.

9. Fuel manifold pressure.

10. Fuel flow.

11. Exhaust nozzle position.

12. Thrust.

13. Temperature of primary structural members subjected to temperatures greater than 200 degrees F.

14. Air Flow.

15. Tail pipe total pressure.

16. Compressor inlet total temperature.

17. Compressor inlet total pressure.

18. Main fuel pump inlet pressure.

19. Main fuel pump discharge pressure.

20. Emergency fuel pump discharge pressure.

21. Compressor discharge pressure.

22. Engine control position.

23. Time.

24. Weather conditions.

3.4.4.2.4.3 Ram-jet, pulse-jet, and rocket engines. A total of one hour of operation in periods of not less than 5 minutes shall be accumulated, with the total operating time divided equally among the following:

a. Level flight at 45,000 feet.

b. Level flight at service ceiling of basic aircraft.

c. Climb at constant Mach number.

Aircraft configuration and data for each of the tests shall be recorded and shall include the following as applicable:

a. Condition of loading.

b. Fuel(s) on board at start of flight.

c. Fuel(s) on board at end of flight.

d. Kind of fuel(s) used.

e. At one minute intervals during the run:

1. Pressure altitude.

2. Air temperature at above altitude.

3. Air speed indicator readings.

4. Fuel pressure(s).

5. Fuel flow.

6. Engine operating pressures.

7. Thrust.

8. Temperature of primary structural members when temperatures exceed 200 degrees F.

9. Oxidizer flow.

10. Any other factors concerning the engine which provide a basis for determining satisfactory or unsatisfactory performance.

f. Weather conditions.

3.4.4.2.4.4 Combination of power plants. On aircraft where combinations of the above listed engines are installed, all engines shall satisfy the requirements for that type engine. Unless otherwise specified, a booster engine shall be demonstrated in level flight at an altitude of 45,000 feet or at the service ceiling (CRT) of the aircraft. The required time on booster engine(s) may be accumulated at the altitude required for the main engine(s) for purposes of combining test programs.

3.4.4.2.5 Propeller demonstration. The propeller shall be demonstrated to show compliance with MIL-P-26366 as specified in the detail specification. This shall consist of operating the propeller at various pitch settings and testing for synchronization, synchrophasing, hunting, and surging.

3.4.4.2.5.1 Low pitch tests. Low pitch blade stop setting shall be checked as required by the propeller manufacturer to demonstrate proper setting and operation. Low pitch stop setting shall be demonstrated to be compatible with engine operation in all flight phases. Demonstrations of engine failure modes shall be made after the low pitch stop setting has been demonstrated.

3.4.4.2.5.2 High pitch tests. High pitch (normal) blade stop setting shall be checked at critical altitude (engine to have torquemeter nose). Selected governing RPM shall be maintained for cruising and for full throttle high speed conditions. For tactical aircraft, blade pitch shall be high to prevent excessive engine overspeeding in limit speed dives. On propellers that can be locked in the normal high pitch position, a check shall determine if the aircraft can be kept airborne (blades locked in normal high pitch) within the power limitations of the engine. If not, the high pitch stop setting shall be reduced to the maximum at which the aircraft can be kept in the air within safe engine operating conditions. This test is also applicable to aircraft with a non-feathering propeller.

3.4.4.2.5.3 Feathering pitch tests. Feathering pitch blade stop settings shall be checked on multi-engine aircraft to determine if feathered propeller windmilling occurs on the stopped engine at the maximum level flight speed obtainable with the operating engines.

3.4.4.2.5.4 Reverse pitch tests. Reverse pitch blade stop (negative) settings shall be checked to determine if engine rated takeoff RPM will be exceeded at full throttle when blades are against negative stops. For this check the aircraft shall be positioned 90 degrees to the wind direction.

3.4.4.2.5.5 Control lever tests. Control, condition, and power levers shall be free from automatic slippage under vibration. Sensitivity of controls shall provide easy and accurate adjustments over the entire speed or power range. Power changes in relation to power lever movement shall be essentially linear.

3.4.4.2.5.6 Synchronization and synchrophasing. The RPM on the slave engines shall not drop more than 2 percent with the synchronizing or the synchrophasing system in operation with engines operating at takeoff RPM and with the master engine power lever retarded to flight idle.

3.4.4.2.5.7 Hunting and surging. Hunting and surging of propeller engine combinations shall not occur for any combination of engine and propeller controls.

3.4.4.2.5.8 Transmission operation demonstration. Power plant drive systems, including any drive shafting, cross shafting and combining gearboxes shall be capable of transmitting full power from a single engine and maintaining propeller synchronization.

3.4.4.2.6 Fuel system demonstration.

3.4.4.2.6.1 Fuel dumping. In-flight operation of fuel dumping arrangements shall be demonstrated in accordance with MIL-F-17874. Fluids other than fuel may be used.

3.4.4.2.6.2 Fuel venting. The fuel vent system and impingement tests shall be demonstrated in accordance with MIL-F-17874. Fluids other than fuel may be used.

3.4.4.2.6.3 Engine fuel feed. Tests shall be conducted on the engine fuel feed system(s) to demonstrate compliance with MIL-F-17874 as specified in the detail specification.

3.4.4.2.6.4 Fueling and defueling. Fueling and defueling tests shall be conducted to demonstrate compliance with MIL-F-17874 as specified in the detail specification.

3.4.4.2.6.5 Fuel transfer system. Tests shall be conducted on the fuel transfer system to demonstrate compliance with MIL-F-17874 as specified in the detail specification.

3.5 Armament system demonstration.

3.5.1 Armament system test. An armament system demonstration test shall be performed to demonstrate that:

a. The firing of guns, launching of rockets or guided missiles, or dropping of stores shall not damage the aircraft structure by

blast or debris such as links, casings, "pigtails," static lines, parachute packs, or diaphragms.

b. Gun gas concentration in the aircraft, during firing, shall not exceed 90 percent of the lower explosive limit (except in the blast tubes and the immediate vicinity of the breech and vent plug). Gun gas measuring equipment shall be approved by the acquiring activity.

c. All applicable sighting and avionic control equipment shall operate in accordance with the equipment specifications throughout the armament demonstration.

d. At no time during the armament demonstration shall compressor stall or engine flameout occur, nor shall the tail pipe temperature in turbojet and turbofan aircraft rise over the allowable transient over-temperature conditions specified by the engine manufacturer.

3.5.2 Aircraft configuration. Except for the instrumentation, the flight test vehicle shall be representative of the production aircraft in all significant respects. The weapons control system shall be configured to accommodate all the weapons required by the detail specification. Weapons carriage provisions shall accommodate the spectrum of weapons to be carried. If applicable, the nuclear weapon Airborne Monitor and Control System shall be installed.

3.5.3 Flight test instrumentation. Onboard instrumentation in accordance with the demonstration instrumentation report shall be provided. The instrumentation shall be capable of measuring and recording the following:

a. Altitude, speed, normal load factor, and attitude during firing or release of weapons and correlating this data with the event in time.

b. Gun gas concentration in the aircraft.

c. Vibration, acoustic levels, and dynamic responses of the weapon, structure, and equipment.

d. Mechanical interface data between the airframe and the weapon to define the maneuvering envelope.

e. Electrical impulses from the weapons control system to arm, fire or release a weapon.

f. Photographic or television coverage to record the initial trajectory of the weapon or store as it is fired, released or jettisoned from the aircraft. This coverage shall be correlated with the above instrumentation.

3.5.4 Contractor demonstration requirements. The armament demonstration program shall consist of:

a. An armament build-up program to ensure that a safe and proper demonstration program can be conducted with a safe interface between the weapons to be carried and the aircraft.

b. A formal ground and flight demonstration in which all of the weapons specified to be carried and launched or released are shown to be compatible with the aircraft and can be employed accurately within the prescribed maneuvering envelope against a suitable target. Safe jettisoning of those stores which are to be carried only shall be demonstrated.

3.5.4.1 Armament build-up program. This program shall consist of both ground and flight functional tests of the armament system and equipment.

3.5.4.1.1 Ground functional tests. These tests shall include firing of guns, missiles, and rockets as applicable; arming and rearming (the time required to rearm the aircraft shall be as specified in the detail specification or the applicable portions of MIL-A-8591, MIL-I-8671,and MIL-I-8675); fit testing; release of all droppable stores (normal arming and emergency release); adequacy of safety devices/provisions; adequacy of handling equipment; adequacy of installation clearances; evaluation of armament hardware/software control items; operation of bombing/navigation systems; adequacy of armament loading tableaus; adequacy of display alerts; and adequacy of "stores remaining" tableau. For those aircraft for which guided missiles are specified, the following ground tests shall be performed:

a. Aircraft/missile system interfaces.

1. Mechanical. Define and verify the physical attachment of the missile and launcher to the aircraft. Verify load carrying capability of the launchers/pylons, jettison capability and other factors pertinent to mechanical interface evaluation. The compatibility of all missile load configurations shall be verified.

2. Electrical. Define and verify the electrical interface of the missile and launcher to the aircraft. Verify the electrical capability of the aircraft electrical wiring connecting the missile to the launcher and the launcher to the applicable fuselage or wing stations.

3. Controls and displays. Determine that the location and actuation of controls and displays are arranged and designed for timely and coordinated inputs from displays such that the aircrew's interpretation and action to ready and launch weapons or activate electronic and other countermeasures is appropriate, effective and within the allowable system response time.

b. Weapons control system. Demonstrate the capability of the weapons control system to provide correct launch acceptability inputs to the missile for prelaunch, launch, and postlaunch operation. These tests shall be performed using mixed loads of

stores and a combination of missile mode, radar mode and navigation mode. Error contributions from avionic system, navigation system and control system to missile performance shall be analyzed. Safety of flight demonstrations shall be performed to identify potential incompatibilities between the missile and aircraft.

3.5.4.1.2 Environmental factors evaluation. Prior to flight test, an environmental factors evaluation shall be conducted for each weapon or store to be carried by the aircraft to assess the probability of environmentally induced damage occurring to either the missile or the aircraft. Factors to be considered include:

a. Loads: Maneuver, gust, catapult, landing, ejection (including ejection of other stores).

b. Dynamics: Vibration, gunfire, aeroacoustic, exhaust (including launch of other stores).

c. Aeroelastic stability: Flutter, divergence, and aero-servoelastic instability.

d. Temperature: Flight induced, climatic.

e. Moisture: Precipitation and spray.

f. Pressure: Altitude arcing, exhaust plume effects on engine operation.

g. Electrical: Power fluctuations, transient EMI, sneak circuits.

h. Handling: Puncture, abrasion, shocks.

Estimation of the probability of occurrence of environmentally induced damage may be based on analyses, reported test results, or documented service data. Probability estimates shall be classified as follows:

High: There are definite historical or analytical reasons for expecting damage.

Medium: There is no reason to expect damage except that the stresses will be higher or of a different kind than previously experienced by the weapon.

Low: The weapon has previously survived equally severe environments.

In each instance of high or medium probability of damage, the specific damage contemplated shall be defined and classified as to whether it would affect safety of flight or mission success, or be a logistic burden. Appropriate tests to demonstrate that these forms of damage will not occur or to measure their likelihood and severity shall be planned as part of the formal armament demonstration.

3.5.4.1.3 Flight functional tests. Functional flight tests shall be performed to: evaluate armament control items within the cockpit; test release and control systems; test software envelope/armament limit equations; test software target selection criteria; test software torpedo presetting; fire guns, missiles, and rockets; demonstrate normal and emergency release of applicable stores; and demonstrate the operation of bombing/navigation systems. Flight tests of normal and emergency release should include a sufficient number of tests to provide a statistical base to determine reliability of arming wire systems used to arm fuzes and deploy stabilizing/retarding devices. For those aircraft for which guided missiles are specified, the following flight tests shall be performed prior to launches:

a. Aircraft/missile system interfaces.

1. Mechanical. In-flight verification of the mechanical interface shall be accomplished in conjunction with other flight tests. The missile shall be captive carried throughout the aircraft flight envelope unless limited by interface loads or the missile or interface specifications. Instrumentation shall be installed to record mechanical interface data.

2. Electrical. In-flight verification of the electrical interface shall be accomplished in conjunction with other flight tests. The missile shall be captive carried throughout the aircraft flight envelope as specified by the aircraft, missile, or interface specifications. Instrumentation shall be installed to record electrical interface data. Successful performance shall be demonstrated for those conditions and configurations identified for the ground functional tests.

3. Controls and displays. In-flight operation of armament controls and displays shall be demonstrated to show compliance with the aircraft detail specification. The demonstration shall include the employment of electronic and optical countermeasures. The demonstration shall include simulated missile attack missions with combat maneuver accelerations.

b. Weapons control system. A sufficient number of captive carry launch sequences, utilizing instrumented missiles or simulated missile load configuration for each type (or major subtype) of missile specified, shall be performed to demonstrate the capability of the weapon control system to provide correct launch acceptability region displays and correct inputs to the missiles for prelaunch, launch, and post-launch operation. Mixed load logic and performance in each combination of missile mode, radar mode and navigation mode shall be demonstrated. A portion of the captive carry launches for each type of missile shall be dedicated to demonstrating correct inputs to the missile in the electronic countermeasure environments specified.

3.5.4.2 Armament system flight and ground demonstrations. Formal flight and ground demonstrations shall be performed following the analysis and approval of the data obtained from the buildup test program. Prior to performing the demonstrations, the Armament Demonstration Test Plan which shall include the tests and procedures for captive carriage at the boundaries of the allowable flight envelope, jettison, release, or firing of all weapons listed in the detail specification shall be submitted. Carriage and jettison of external stores which are not normally released shall be included.

3.5.4.2.1 Gun demonstration requirements. The operation of gun installation, both fixed and turret mounted, including accessories and directly associated equipment, shall be demonstrated. This demonstration shall include simulated operation, rearming, boresighting, ground maintenance, and operation in-flight. The ground demonstration shall include ground firing for dispersion characteristics.

3.5.4.2.1.1 Heavy attack and patrol aircraft. In-flight operation of the gun installation shall consist of firing two complete loads of ammunition in bursts of not less than 100 rounds from each gun, with all guns firing simultaneously, with three seconds maximum interval between bursts. Firing shall be performed under the following conditions:

a. Altitude: The aircraft shall be flown through the following altitude cycle prior to firing:

   1. Climb to within 2,000 feet of the design service ceiling (intermediate thrust) and remain at this altitude not less than five minutes.

   2. Descend to any altitude under 7,000 feet and remain at this altitude not less than five minutes.

   3. Climb to within 2,000 feet of design service ceiling (intermediate thrust) and remain at this altitude for not less than 10 minutes and then commence firing.

b. Speed. The first load shall be fired at a minimum stabilized level airspeed. The second load shall be fired during indicated airspeed within 0.8 V_{max} to V_{max}.

c. Normal load factor. The first load shall be fired at a load factor of 1.0. The second load shall be fired at a load factor of $0.9n_z$ max or 0.9 maximum safe load factor at the specified altitude.

3.5.4.2.1.2 Fighter, trainer and light attack aircraft. In-flight operation of fixed gun installations shall consist of firing four complete loads of ammunition in bursts of not less than 100 rounds from each gun, with all guns firing simultaneously, with three seconds maximum interval between bursts. Firing of the first two loads shall be performed under the conditions specified for heavy attack and patrol aircraft. One short duration interrupted burst (interruption of 300 to 500 millisecond) shall be conducted. Firing of additional loads, as required, shall be conducted under the following conditions:

a. Altitude. The aircraft shall be flown through the following altitude cycle prior to firing:

1. Climb to within 2,000 feet of the service ceiling (military power) and remain at this altitude for 10 minutes and then fire approximately one-half load. The 10 minute dwell at altitude may be curtailed as necessary contingent upon the amount of fuel available. (Service ceiling is defined as that ceiling obtained with the use of afterburner or similar power augmentation.)

2. Descend to any altitude under 7,000 feet and remain at this altitude not less than five minutes.

3. Climb to 20,000 feet altitude and remain at this altitude not less than 15 minutes and then fire the remainder of the load in short intermittent bursts.

b. Speed. The firing shall be performed as follows:

1. Low speed firing tests. The guns shall be continuously fired while the aircraft is maneuvered rapidly from unaccelerated flight to at least $0.9n_{zmax}$ and back to unaccelerated flight. The airspeed at the time $0.9n_{zmax}$ is attained shall be within 10 knots above the corresponding stall speed. The altitude at which the test maneuver is initiated shall not exceed 7,500 feet. Following low speed tests at $0.9\ n_{zmax}$, a firing shall be conducted at 0.0g.

2. High speed firing tests. The guns shall be fired continuously while the aircraft is maneuvered from 1.0g flight to at least $0.9n_{zmax}$ and back to 1.0g flight. The speed throughout the maneuver shall be not less than $0.9V_{max}$ at the altitude at which the tests are conducted. The altitudes of the test shall not exceed 7,500 feet. Following the high speed tests, a firing shall be conducted at 0.0g.

3. High altitude firing tests. The guns shall be fired continuously while the aircraft is maneuvered rapidly to at least $0.9n_{zmax}$ at the specified altitude. In addition, all guns shall be fired simultaneously for a duration of four seconds or a full load whichever is less, at an airspeed no greater than 1.1VS in cruise configuration (CR) at the specified altitude. The altitude at which the tests are performed shall be 3,000 $\pm$ 1,000 feet below the maximum altitudes attainable at subsonic speed and at supersonic speed by the aircraft at combat weight and combat power.

c. Boresight retention. Boresight retention of fixed guns shall be demonstrated in accordance with MIL-I-8670.

3.5.4.2.1.3 Gunfire vibration and aeroacoustic environment. During ground and flight gun firing demonstrations, vibration and aeroacoustic measurements on the structure and equipment shall be made. The data

shall be used to verify and correct predicted design vibration and aeroacoustic levels and dynamic responses of structure and equipment. The data shall also be used with analytical methods to verify that the aircraft and equipment can withstand the gunfire environment.

3.5.4.2.2 Rocket demonstration requirements. Satisfactory operation of rocket installations shall be demonstrated. This shall include simulated operation, rearming, boresighting, ground maintenance, and operation in-flight. During the rocket firing demonstration, it shall be demonstrated that the tail pipe temperature in turbojet aircraft does not rise over the allowable transient overtemperature conditions specified by the engine manufacturer, and that there is no other evidence of compressor stall or engine flameout.

3.5.4.2.2.1 Air-to-ground rockets. In-flight demonstration of air-to-ground rockets shall consist of firing two complete loads of inert warhead rockets of each type specified for the aircraft under the following conditions:

a. Altitude. The aircraft shall be flown through the following altitude cycle prior to firing:

   1. Climb to within 2,000 feet of the design service ceiling (military power) and remain at this altitude not less than five minutes.

   2. Descend to any altitude under 7,000 feet and remain at this altitude not less than five minutes.

   3. Climb to within 2,000 feet of design service ceiling (military power) and remain at this altitude for not less than 15 minutes.

   4. Descend to within ground target range and commence firing.

b. Speed. The first load shall be fired at a minimum stabilized level flight airspeed. The second load shall be fired during indicated airspeed within $0.8V_{max}$ to V_{max}.

c. Normal load factor. The first one-half load shall be fired at 0.5g and the second one-half load at 1.0g. The second load shall be fired at $0.9n_{zmax}$ or 0.9 maximum safe load factor at the specified altitude.

3.5.4.2.3 Guided missile demonstration requirements. Satisfactory operation of the guided missile installations specified in the detail specification shall be demonstrated. The demonstration shall consist of captive carry, free flight launches, and jettison.

3.5.4.2.3.1 Captive carry tests. A series of captive carry flights shall be conducted in accordance with the Armament Demonstration Test Plan to demonstrate the missile's ability to withstand the conditions imposed on it during operations throughout the aircraft flight envelope. It shall be demonstrated that the missile passes all tests required by the aircraft/missile interface specification. Following each

demonstration flight, the missile and the aircraft shall be tested in the same manner as the pre-flight test.

3.5.4.2.3.2 Free flight missile launches. Two loads of missiles shall be launched within the design launch envelope of the missile. The first load shall be fired at minimum stabilized level flight airspeed. The second load shall be fired at the maximum airspeed of the aircraft/missile combination. One missile shall be launched at low altitude and at maximum airspeed from the station closest to the aircraft centerline and farthest aft. The launch shall demonstrate the ability of the missile to survive launch and acquire a target. Guidance functions, acceleration, vibration, and control surface motions shall be measured during this launch. Electrical power delivered to the missile shall be recorded and any startup transients identified.

3.5.4.2.3.3 Jettison requirements. It shall be demonstrated that missiles can be jettisoned from any of the carriage stations and that the entire load of missiles can be jettisoned without damage to the aircraft.

3.5.4.2.3.4 Missile vibration and aeroacoustic environment measurement tests. The vibration and aeroacoustic environment induced on the missile(s) shall be measured for the conditions specified in MIL-A-8870. For each type of missile, an environment measurement vehicle shall be carried on the station (if carried on more than one) where the aerodynamic turbulence will be most severe.

3.5.4.2.4 Droppable stores.

3.5.4.2.4.1 Conventional stores. Satisfactory operation of applicable conventional store installations and associated release equipment shall be demonstrated. Conventional stores include bombs, mines, torpedoes, flares, float-lights, sonobuoys, searchlights, fuel tanks, etc. This demonstration shall include:

a. Loading and unloading within the time specified in the detail specification.

b. Maintenance procedures.

c. Check of the control and monitor circuits on the ground and in flight for all delivery modes.

d. Release of stores in flight. A build-up in airspeed shall be performed where no previous data (wind tunnel, analysis, etc) exists for any store.

3.5.4.2.4.1.1 Release of stores in flight. Flight demonstration shall consist of dropping one complete load of stores as follows:

a. Type of stores. External stores selected from those required in the detail specification shall be dropped from the most critical stations in the most critical configurations, including "mixed" loadings, for each demonstration of release tactics and bomb control equipment. Only inert stores shall be used.

b. Separation. Positive separation shall be demonstrated to occur immediately upon actuation of the release system with no interference between the released store(s) and any part of the aircraft and adjacent stores, and with no damage to the released store or to the aircraft. The attitude of store(s) during separation shall be such that each store can perform its intended function and shall not hinder the pilot in the performance of appropriate escape maneuvers for the type of delivery performed.

c. Release control. Both primary and emergency method of release shall be demonstrated.

d. Structural integrity. No evidence of deterioration, damage to the aircraft structure, adjacent stores or the store itself shall occur within the specified flight conditions.

e. Release parameters.

1. Speed. Release of stores shall be demonstrated at the applicable maximum permissible speed for the aircraft, or for the store, (whichever is less). The maximum release speed shall be recorded.

2. Altitude. For stores capable of being dropped from high altitudes, release shall be accomplished at 2,000 feet below the service ceiling after remaining at this altitude for 30 minutes. For other droppable stores (torpedoes, mines, flares, etc.) the release shall be made at an appropriate altitude below 3,000 feet.

3. Normal acceleration. The heaviest store load shall be dropped at $0.9n_{zmax}$ to n_{zmax} or maximum acceleration permissible for the store. It shall be demonstrated that all store types can be dropped at 0.5g or at the minimum safe g established during the buildup flight tests.

4. Dive angle: Stores shall be dropped in the maximum safe dive angle established during the buildup flight tests.

5. Release interval. For stores which are released in multiple release modes, the full load shall be released at the minimum allowable interval at the most critical combination of release parameters defined by analyses approved by the Test Authority.

6. Combinations of release parameters. Stores shall be dropped in the most critical combination of subparagraphs 1 through 5 above. Unless analyses indicate otherwise, this shall be maximum airspeed, minimum normal acceleration, maximum dive angle, minimum release interval, and minimum safe release altitude.

f. Release tactics. A tactical release shall be demonstrated for each of the aircraft delivery modes. The tactics to be used for release of the various types of stores shall be in conformance with the mission and bomb control equipment of the aircraft. When specific tactics are not applicable, sufficient releases shall be demonstrated under varied conditions to define an envelope of release conditions. The demonstration shall include store separations at the most critical Mach number and load factor combination of the specified flight envelope of the aircraft-store combination. The following shall be recorded (via telemetry) at the time of release: airspeed, altitude, attitude in pitch, yaw rate, roll rate, vertical acceleration, longitudinal acceleration, and lateral acceleration.

g. Aircraft guidance and store release system. Satisfactory operation of the aircraft guidance and store release system shall be demonstrated. The accuracy of the store drop shall be within the limits specified in the detail specification.

h. Jettisoning. Jettisoning of all specified stores shall be demonstrated. For stores of variable weight (rocket pods, chemical dispensers, etc.), the lightest configuration shall be demonstrated, unless analyses shows another combination of weight, c.g., and Moment of Inertia (MI) to be more critical. For jettisoning tests of external auxiliary fuel tanks, the tanks shall be jettisoned in the full, half full, and empty conditions between and EAS equal to $1.2V_S$ at sea level and an EAS equal to $0.9V_H$ at sea level. The partially full condition shall be a condition that causes the most critical separation characteristics with regard to possible damage to the aircraft or any retained stores. The tanks shall not hang up on the aircraft, and neither the aircraft nor retained stores shall be damaged. The tanks shall be jettisoned with the aircraft in level flight in the basic configuration. Liquids other than fuel may be used in the fuel tanks.

3.5.4.2.5 Nuclear weapons requirements. Operation of nuclear-store installations, including missiles with nuclear warheads, and the associated suspension and release equipment shall be demonstrated. This demonstration shall include tests of the airborne monitor and control system.

3.5.4.2.6 Armament control system. Satisfactory operation of the armament control installations shall be demonstrated in accordance with MIL-STD-1760. The demonstration shall include servicing and removal exercises, boresighting, simulated ground operational checks, and airborne operation of the armament controls.

3.5.4.2.7 Accuracy. Accuracy of the weapons control system shall be demonstrated by expending specified ordnance at a suitable target or by use of release-point-in-space technique.

3.5.4.2.8 Armament ground support equipment. Armament ground support equipment shall be demonstrated to ensure that no equipment interference or functional problems exist. Validation of related checklists and technical publications shall be included in the demonstrations. Ground support equipment shall include missile transporters, support adapters, missile containers, loaders, and hoists with associated adapters.

3.5.4.2.9 Miscellaneous. Operation of miscellaneous armament installations shall be demonstrated to show compliance with the detail specification. There shall be no deleterious effects from the operation of these items, such as corrosion resulting from smoke or blast, or damage from ejected debris. Examples of these items are: armor, smoke screen equipment, target towing gear, chemical dispersal gear, and magnetic anomaly detection gear. Installation and removal of special field conversion kits shall be demonstrated as applicable.

3.6 Carrier suitability demonstration.

3.6.1 Carrier suitability tests. The carrier suitability requirements of the detail specification shall be demonstrated. Tests shall be conducted ashore prior to shipboard tests by Navy pilots. Strength of the airframe, controllability, engine tolerance to steam ingestion, and optimization of the Approach Power Compensator System (APCS)/Automatic Carrier Landing System (ACLS) shall be demonstrated.

3.6.2 Aircraft configuration. The aircraft used for the structural demonstration of carrier suitability shall have production representative airframe, engine, and control system. The aircraft used for the APCS/ACLS demonstration shall be a full-system aircraft representative of the production aircraft in all significant respects.

3.6.2.1 Center-of-gravity positions. The center-of-gravity positions for the tests shall be those which are critical for the individual test.

3.6.2.2 Gross weight and loading conditions. For catapult launches and arrestments, the gross weight and loading configurations shall be as follows:

a. Catapult launches shall be made in each of the following configurations:

   1. Without bombs, rockets, guided missiles, mines, ammunition, external fuel, or other disposable load items, but with full internal fuel.

   2. Maximum fuel (same as above, plus the maximum fuel carried in internal and external stores).

   3. Maximum fuel with stores (maximum fuel plus ammunition, bombs, rockets, guided missiles, mines, torpedoes and other stores). Critical store configurations shall be demonstrated.

4. Maximum design gross weight with normal landing gear servicing and alternately with the most critical servicing within the limits of MIL-A-8863.

5. Partial fuel (fuel loadings selected to cover other gross weights, with and without stores).

6. All other critical store loading configurations.

7. Maximum asymmetric store loading.

b. Arrested landings shall be made in each of the following configurations:

1. Clean configuration.

2. The aircraft loaded to attain the weight specified in the carrier landing design gross weight definition in MIL-A-8860, in critical combination with external stores for which strength for arrested landings is required, and alternate critical combinations of lower gross weights and loading configurations. The weight distribution, including ballast, shall be distributed to attain the specified aircraft gross weights. For at least one of the loadings herein, the landing gear servicing shall be the most critical within the limits determined from the landing gear servicing test of MIL-A-8867.

3. Maximum asymmetric store loading.

3.6.3 Aircraft instrumentation. Aircraft to be used for the structural demonstration of carrier suitability shall be instrumented in accordance with paragraph 3.2.3.2. For the APCS/ACLS tests, the aircraft shall be instrumented to provide a record of deviations from the programmed flight path and an airspeed and attitude presentation throughout the approach.

3.6.4 Facilities for carrier suitability tests. The Government will furnish the facilities required for the carrier suitability demonstration specified herein and for the buildup tests, and will retain full control of the facilities during these tests.

3.6.5 Demonstration test requirements.

3.6.5.1 Demonstration. The carrier suitability demonstration shall be performed as specified in Table V. Design catapult and arresting hook loads and design load factors shall be attained when applicable. When design load factors are demonstrated, the aircraft gross weight may be reduced as required to avoid exceeding the design limit catapult or arresting hook loads. Where both limit load and limit load factor can not be attained in any one test condition because of the capacity of the facilities furnished by the Government, the specified gross weight may be reduced by the acquiring activity to attain limit load factor. Critical conditions shall be approached gradually in buildup tests. The number of build-up tests shall be included in the Carrier Suitability Test Plan and Schedule.

3.6.5.2 Configuration changes. After each catapult launch or field take-off following an arrested landing, the landing gear and all other devices required to transition from the take-off configuration to the clean/cruise configuration and back to the landing configuration shall be cycled.

3.6.5.3 Catapulting. Catapult launches shall be performed to demonstrate that the aircraft can be suitably launched from the catapults of the aircraft carriers from which it is required to operate. Absence of perceptible shimmying and hunting characteristics of the nose gear shall be demonstrated.

3.6.5.3.1 Catapult accessories. It shall be demonstrated that catapult accessories have the required strength, a satisfactory service life, and are carrier suitable as required by MIL-L-22589, MIL-B-85110, and MIL-A-8863. There shall be adequate clearances between the aircraft, its stores, and the holdback at the time of release of the aircraft from the catapult. It shall be demonstrated that the launch-bar system has satisfactory extension, holddown, and retraction characteristics; does not cause damage to the catapult or aircraft components; does not interfere with the cross-deck pendants during arrestments; and does not impact the flight deck immediately after disengagement from the catapult shuttle spreader at the end of the power stroke. Control of the launch bar to the "up" position shall be demonstrated to be independent from the aircraft engine throttle.

3.6.5.3.2 Catapult spotting (prior to tensioning). Spotting including catapult hookup, suspend, and abort operations aboard aircraft carriers shall be demonstrated. Both on-center and off-center approaches shall be demonstrated. For demonstrations, the main gear off-center location at the time of holdback release shall be 24 inches from either side of the centerline of the catapult or that resulting from a maximum 15 degree entry angle (between the center line of the aircraft and the centerline of the catapult), whichever is less. This requirement is specified in MIL-L-22589 and is diagrammed in Figure 1. On-center and off-center launches shall be demonstrated for all representative gross weights.

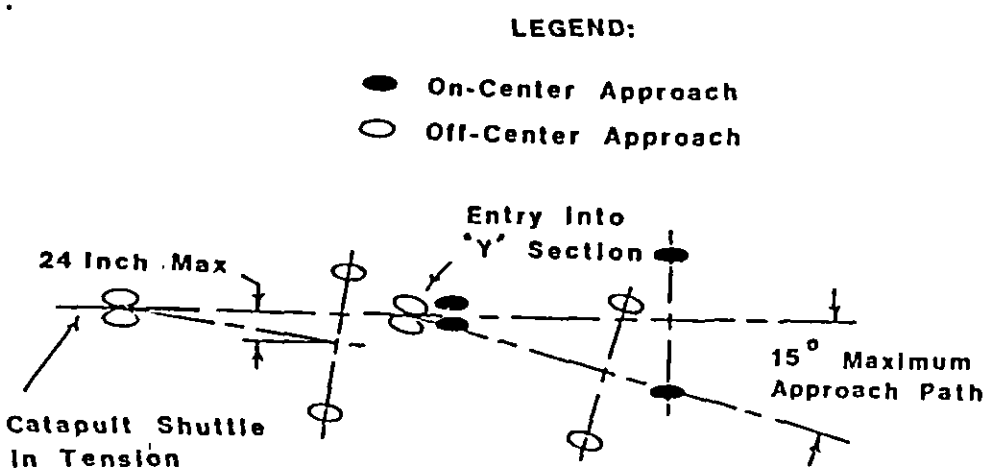

FIGURE 1. On-center and off-center spotting for nose gear launch aircraft.

3.6.5.3.2.1 Configuration for catapulting. Both, on-center and off-center spotting conditions shall be demonstrated for each configuration of 3.6.2.2a. For the asymmetric configuration, catapult takeoffs shall be demonstrated for off-center spotting in both directions, left and right.

3.6.5.3.3 Controllability. Catapult launches shall be performed at the minimum safe launching airspeed and with either 40 knots above the minimum safe airspeed or at the maximum airspeed attainable if the 40 knot margin cannot be achieved. Trim is optional, but shall remain fixed during each launch until an airspeed is reached at which high lift devices may safely be retracted or turned off (25 knots above the trim speed for catapult end airspeed when no high lift devices are employed). Under these conditions it shall be demonstrated that:

a. There is adequate longitudinal control effectiveness to prevent pitch up or pitch down to undesirable attitudes.

b. The longitudinal control forces are within 20 pounds pull and 10 pounds push.

c. Predetermined control programming or unusual control manipulation by the pilot is not required.

d. Directional oscillations under all combinations of gross weight, catapult accelerations, and required spotting conditions are convergent.

3.6.5.3.4 Aircraft flight control systems. During the catapult launching tests, the effectiveness of the aircraft flight control systems in the normal and emergency conditions, (including the switch-over to and from the normal and emergency systems) shall be demonstrated.

3.6.5.3.5 Steam ingestion tests. It shall be demonstrated that the engine is not affected or is tolerant of steam ingestion by launches from a shorebased "degraded" catapult that is typical of the "worst case" of a worn shipboard catapult. This demonstration shall be conducted for all engine power levels available for a shipboard take-off.

3.6.5.3.6 Jet blast deflector acoustic and thermal environment test. Catapult aeroacoustic and thermal tests shall be conducted ashore in accordance with MIL-A-8870 to demonstrate that the aircraft can withstand the catapult environment immediately forward and aft of the Jet Blast Deflector (JBD) without adverse effects on the aircraft structure, structural components, or engine operation. The proposed test arrangement shall be provided at the Structural Ground Loads and Carrier Suitability Demonstration Planning Conference.

3.6.5.4 Arresting. Arrested landings shall be performed to demonstrate that the aircraft can consistently engage the arresting gear and that aircraft motions during the arrested run-out are conducive to safe shipboard arrestments. It shall be demonstrated that there is no cable impact damage to the aircraft or stores during arrested landings or bolters for all landing conditions and landing configurations. The arresting system shall be suitable for arrested landings in accordance

with MIL-A-18717 and MIL-A-8863. Satisfactory swiveling of the nose gear for roll back in the arresting gear shall be demonstrated. Satisfactory anti-hunting and shimmy characteristics of the nose gear shall be demonstrated. Abrupt application of brakes during the post arresting roll-back shall be demonstrated.

3.6.5.4.1 Arresting configurations. The tests of Table V shall be demonstrated for each of the arrested loading configurations of 3.6.2.2b. For the asymmetric configuration, Test "b" shall be performed off-center to the left and repeated to the right. The nomenclature and symbolism of Table V are specified in MIL-A-8863.

3.6.5.4.2 Arresting hook damping. It shall be demonstrated that the arresting hook has satisfactory damping following impact with a deck obstruction. The effect of under serviced arresting hook damper(s) on arresting hook dynamics following impact with a deck obstruction shall be demonstrated.

3.6.5.4.3 Approach speeds. A range of approach speeds from V_{PAmin} to 15 knots above 1.1 V_{PAmin} shall be demonstrated.

3.6.5.4.4 Wave-off capability. Wave-off capability under the most stringent approach conditions shall be demonstrated.

3.6.5.5 Flight control systems.

3.6.5.5.1 Automated Flight Control System (AFCS). The AFCS shall be demonstrated to show compliance with the requirements of MIL-F-9490 and MIL-C-18244 as specified in the detail specification.

3.6.5.5.2 Approach Power Compensator System (APCS).

3.6.5.5.2.1 APCS ground tests. Prior to carrier suitability demonstration, ground demonstrations shall be performed on the approach power compensator system to show compliance with the requirements of MIL-C-23866 as specified in the detail specification.

3.6.5.5.2.2 APCS flight tests. Satisfactory performance of the APCS shall be demonstrated ashore for both manual and automatic carrier landings.

3.6.5.5.3 Automatic Carrier Landing System (ACLS).

3.6.5.5.3.1 ACLS simulation demonstration. A simulation of the ACLS shall be conducted to verify that the predicted performance meets the requirements of AR-40 (both closed and open loop). The simulation shall be updated with any changes made to the aircraft or aircraft data base and shall be verified with the flight test results. The simulation shall be repeated when significant updates are required.

3.6.5.5.3.2 ACLS ground demonstration. Prior to the carrier suitability demonstration, the following shall be completed:

TABLE V. Arrested landing tests.

1	2	3	4	5	6
Test no.	Type of landing	Sinking speed (FPS)	Pitch angle (deg)	Roll angle (deg)	Remarks
a	On center	Not less than $\bar{V}_{Vc}$	Optional	Optional	Attain limit hook load.
b	Off center				Attain limit hook load, 25 feet off-center.
c	Rolled		Mean ±1	Not less than 6	Attain limit hook limit.
d	Rolled and yawed		Optional	Not less than 5	Perform twice, once with roll in same direction as yaw and once with roll in opposite direction to the yaw. The yaw angle shall not be less than 5 degrees.
e	Tail down	Not less than $\bar{V}_{Vc}$ +3 σ V_{Vc}	Not less than mean +3	Optional	Perform once to the conditions specified or, alternatively three times but with sinking speed not less than 0.8 times the specified sinking speed.
f	Nose down		Not greater than mean −3		
g	Mean		Mean ±1.5		See Note 1
h	Free flight without deck obstruction	Not more than $\bar{V}_{Vc}$ −3 σ V_{Vc}	Not less than angle corresponding to 1.3W lift at $1.05V_{PAmin}$ at wire engagement		Perform once to the conditions specified or, alternatively three times but with the specified sinking speed increased by 2 FPS and the specified pitch angle reduced by 2 degrees. The hook load for all free flight engagements shall not be less than 85 percent of limit.
i	Free flight with deck obstruction		Not less than the angle corresponding to 1.0W lift at $1.05V_{PAmin}$ at wire engagement		See Note 2

TABLE V. Arrested landing tests - Continued.

Notes:

1. One third of the total landing, but not less than 3, shall be performed to demonstrate strength for landings over carrier deck obstructions (cable or guide light cover plate, whichever is more critical). For each of these landings, the vertical main gear load, just prior to tire contact with the obstruction, shall be not less than 75 percent of the load attained without the superposition of the deck obstruction load.

2. One third of the total landings, but not less than three, required for test shall be performed to demonstrate strength for carrier landings over deck obstructions (cable or light cover plate, whichever is more critical). For each of these landings, the vertical nose gear load, just prior to tire contact with the obstruction shall be not less than 75 percent of the load attained without the superposition of the deck obstruction.

a. Continuity checks of all system wiring.

b. Measurement of all signal transport delays from end to end (sensor output to control surface command).

c. Verification of data link and Instrument Landing System (ILS) displays switch operation, discretes, and data polarity and scaling.

d. Measurement of ACLS, AFCS, and APCS component static gains and response to step and sine wave inputs. This may be performed on a laboratory bench.

e. Measurement of the control surface response to sine wave commands.

f. End to end measurement of the total ACLS airborne system static gains and hysteresis characteristics (all command and sensor inputs to control surface). If feasible, these measurements shall be made with the sensors removed from the aircraft and mounted on calibration equipment. Otherwise, the signal substitution method can be used.

3.6.5.5.3.3 Automatic Carrier Landing System (ACLS) functional check flight. A functional check flight shall be performed to verify that the aircraft ACLS installation, including the radar augmenter, data link, cockpit displays and controls, ILS, AFCS, and APCS are functioning properly. The aircraft shall provide a stable, repeatable response to ACLS commands and shall not inadvertently uncouple when under automatic control.

3.6.5.5.3.4 ACLS open loop flight demonstration. Flights to demonstrate aircraft response to open loop ACLS step and sine wave commands shall be performed. The aircraft response shall match the results of the ACLS simulation.

3.6.5.5.3.5 ACLS closed loop flight demonstration. Flights to demonstrate aircraft response to closed loop ACLS step and sine wave commands and aircraft performance during normal ACLS Mode 1 approaches shall be performed. The aircraft response to step and sine wave commands shall match the results of the ACLS simulation. The aircraft shall provide stable, repeatable responses during Mode 1 approaches and shall not inadvertently uncouple.

3.6.5.6 Vertical/Short Take-Off and Landing (STOL) aircraft.

3.6.5.6.1 Control and performance characteristics. Take-off, approach and landing characteristics shall be demonstrated in Vertical Takeoff (VTO), Vertical Landing (VL), Short Takeoff (STO), Short Landing (SL), and hover (as applicable) at the minimum guaranteed installed engine thrust.

3.6.5.6.2 Exhaust gas ingestion. Engine tolerance to exhaust gas ingestion shall be demonstrated in the VTO/VL for all power levels.

3.7 Installed systems demonstration.

3.7.1 Installed systems and equipment. Demonstrations of the systems and equipment installed in the aircraft shall consist of ground and flight tests as applicable.

3.7.2 Systems configuration. Installed systems to be demonstrated shall be representative of those in the production aircraft. If compatibility with the basic airframe and engine is to be demonstrated, they shall be representative of the production aircraft.

3.7.3 Test instrumentation. Where test data is recorded during the demonstration, instrumentation necessary to show compliance with the requirements of the detail specification shall be installed.

3.7.4 Avionic system demonstration. It shall be demonstrated that the performance, installation, and compatibility of the avionic system meets the requirements of the detail specification in all modes of operation.

3.7.4.1 Installation. It shall be demonstrated that the installation of all avionic equipment and related accessories of the system complies with the requirements of MIL-I-8700 and the applicable equipment installation specification.

3.7.4.1.1 Temperature. Adequate avionics cooling shall be demonstrated in accordance with MIL-E-18927 under all ground and flight operational conditions of the aircraft. Ground demonstration shall include all ground cooling modes of operation including engines, Auxiliary Power Units (APU), on board fans, external cooling cart, external pneumatic cart, or any combination thereof, if applicable. The ambient temperature in all compartments containing avionics equipment and individual avionics exhaust temperatures shall be demonstrated to be within the values of the individual equipment specifications or MIL-E-5400, whichever is more stringent. Temperatures measured in accordance with MIL-T-18606 shall be monitored by a thermocouple or similar sensor and records shall be maintained of temperature with simultaneous recordings of compartment ambients, forced air, or liquid coolant temperatures, and flow rates at the equipment coolant inlets. These recorded data shall be summarized in the Avionics System Demonstration Report.

3.7.4.1.2 Condensation. It shall be demonstrated in accordance with MIL-E-18927 that following ground and flight tests, air ducts to equipment are free from moisture after each test. Equipment failures, either permanent or temporary in nature, shall be investigated and reported.

3.7.4.1.3 Vibration and shock loads. It shall be demonstrated that each avionic equipment is not subjected to vibration or shock loads greater than the limits of the equipment specification.

3.7.4.1.4 Interface tests. It shall be demonstrated that interface requirements for each equipment, e.g., power, signal, fluidal, and Automatic Test Equipment (ATE) meet individual equipment requirements.

3.7.4.1.5 Antennas. It shall be demonstrated that antenna subsystems, as installed in the aircraft, meet the requirements of MIL-STD-877 and the applicable equipment specifications. Flight demonstrations to substantiate model radiation patterns and other laboratory results shall be performed to verify the capability of the avionics system to meet the specified aircraft missions. It shall be demonstrated that:

a. The azimuth and elevation coverage of antennas of the various aircraft configurations at the required frequencies, are within specified values.

b. The gain of the antennas, with reference to the isotropic radiator, is adequate to accomplish mission requirements.

c. Isolation between antennas and between systems using a common antenna is adequate to prevent impairment of the operation of either system.

d. The mechanical operation of rotatable and other antennas having moving parts, and antennas with other controllable features, operate satisfactory and coverage is within specified values.

e. When operated at full power, the antenna shall not exceed the maximum temperature, input power (RF, control and power supply), or aircraft supplied coolant specified in the antenna specification.

3.7.4.1.6 Radar and infrared equipments. It shall be demonstrated that radar and infrared equipment operate in accordance with applicable specifications. All radiation tests shall be conducted at properly instrumented facilities for control of position and flight path, in addition to electrical measurements. The demonstration shall include the following:

a. Detection range and range and azimuth resolution shall be evaluated during a profile of typical flight conditions and system modes for all antenna patterns. These tests shall be performed using radar corner reflectors or other known targets. Resolution is defined as the smallest spacing between a pair of reflectors which can be discerned on the radar display.

b. Antenna stabilization in pitch, roll, and yaw.

c. Flight control and guidance integration.

d. Accessory integration and compatibility.

e. Antenna pattern coverage in the proper polarization field and the cross polarization field.

f. Indicator display in all radar (and IR) modes under all ambient light levels and flight tactics within the specified performance envelope.

g. Dot flyability and snap-up features, if any.

h. Counter-countermeasures procedure and circuitry.

3.7.4.1.7 Intrasystem Electromagnetic Compatibility (EMC) and Electromagnetic Interference (EMI). It shall be demonstrated that EMC and EMI for all avionic subsystems and equipment comply with the requirements of MIL-E-6051 and MIL-STD-461 as specified in the detail specification. The intrasystem electromagnetic performance of all aircraft equipment and subsystems shall be demonstrated. Equipments shall operate without mutual interference or degradation of performance in accordance with the detail specification.

3.7.4.1.8 Intersystem Electromagnetic Compatibility (Electromagnetic Vulnerability (EMV)). It shall be demonstrated that all avionic subsystems and equipment remain mission capable without endangering safety of flight or causing mission abort during or after exposure to the external electromagnetic environments specified in MIL-HDBK-235-2. All aircraft equipment and subsystems shall be demonstrated to operate when exposed to shipboard, aircraft, and land-based emitters.

3.7.4.1.9 Optical apertures. It shall be demonstrated that sensor subsystems requiring aircraft external optical apertures meet the detail specification requirements for EMI/EMC/EMP including Fleet contamination situations and other requirements such as Radar Cross Section (RCS) and Infrared (IR) signature suppression specified in the detail specification.

3.7.4.1.10 Nuclear Electromagnetic Pulse (NEMP). It shall be demonstrated that the aircraft remains mission capable after exposure to the NEMP environment in DOD-STD-2169 as specified in the detail specification. Flight critical and mission essential equipments shall be evaluated in simulated NEMP environments to verify and determine their level of NEMP protection.

3.7.4.1.11 Hazards of Electromagnetic Radiation to Personnel (HERP). It shall be demonstrated that control of radiation levels is sufficient to preclude hazard to personnel. HERP levels, identified to personnel outside the aircraft who are exposed to on-aircraft emitters at various angles/distances, shall be demonstrated to meet the requirements of MIL-STD-1385 as specified in the detail specification.

3.7.4.1.12 Hazards of Electromagnetic Radiation to Ordnance (HERO). It shall be demonstrated that the design precludes hazards and performance degradation in the electromagnetic environment specified in the detail specification.

3.7.4.1.13 Hazards of Electromagnetic Radiation to Fuel (HERF). It shall be demonstrated that the design precludes the hazards of RF radiation to fuel as specified in the detail specification.

3.7.4.1.14 Hazards of lasers. It shall be demonstrated that all aircraft equipment (including sensors) and aircrew can achieve mission essential performance in the presence of laser dazzle or damage energy as specified in the detail specification.

3.7.4.1.15 Hazards of High-Powered Microwaves (HPM). It shall be demonstrated that all aircraft equipment (including sensors) and aircrew can achieve mission essential performance in the presence of HPM radiation as specified in the detail specification.

3.7.4.1.16 Emission Control (EMCON). It shall be demonstrated that, in the standby mode of operation, no equipment emits radiation which exceeds the EMCON requirements specified in the detail specification.

3.7.4.1.17 Lightning. A lightning protection test shall be performed in accordance with MIL-STD-1795 using the lightning test waveform of MIL-STD-1757. Artificial lightning discharge tests shall be performed with all flight critical subsystems and components installed.

3.7.4.1.18 Precipitation static. It shall be demonstrated that precipitation static (P-Static) does not adversely affect aircraft safety or the ability to perform the assigned mission. P-Static control shall be demonstrated by instrumented flight into charge conditions or by simulated ground testing.

3.7.4.1.19 TEMPEST. It shall be demonstrated that all secure communications equipment and associated installations comply with the requirements of the detail specification.

3.7.5 Electrical system. Electrical system ground and flight tests shall be performed to demonstrate the capability of the system to perform in accordance with the requirements of the detail specification.

3.7.5.1 Performance demonstration. It shall be demonstrated that the electrical system performs all functions required by the detail specification. The demonstration shall include accessibility of units for test and adjustment, removal, and handling for servicing. It shall be demonstrated that the installation meets the requirements of MIL-STD-810, MIL-W-5088, MIL-E-7080, MIL-B-8565, MIL-R-23761, MIL-E-24021, MIL-B-81757, MIL-E-81910, MIL-B-83769, DOD-C-85050, MIL-I-85071, MIL-E-85583, and DOD-B-85584 as specified in the detail specification.

3.7.5.1.1 Temperature and vibration. It shall be demonstrated that the operating temperatures and vibration levels of all electric, power, and conversion equipment are within the specification design limitations of the equipment determined by the equipment qualification tests. Additional load banks, as necessary, shall be installed in the demonstration aircraft for both ground and flight tests to obtain the maximum load on generation and conversion electric power equipment. Electrical load equal to the power needed to support the aircraft or the rating of the power producing equipment, whichever is greater, shall be applied to generation and conversion electric power equipment for each operating condition of the aircraft. The temperature of one or more critical parts within each equipment shall be monitored with simultaneous measurements of compartment ambients, input and exit temperatures. Flow rates of equipment coolant shall be determined at the full rated output of the equipment, or with loads applied to the equipment, whichever temperature is greater. It shall be demonstrated that the vibration and shock imposed on all equipments are within the specification design limitations of these equipments determined by equipment qualification tests.

3.7.5.1.2 Prime mover capacity. It shall be demonstrated that the prime mover delivers the required mechanical input to the generating system to maintain electrical generating system rated loads and overloads.

3.7.5.1.3 Electrical power. Aircraft electrical generation and conversion capacity shall be based upon the preliminary load analysis, including excess capacity requirements in accordance with MIL-E-7016. The electrical power to support the aircraft or the rating of the power producing equipment, whichever is greater, shall be demonstrated as conforming to the detail specification for each operating condition of the aircraft. It shall be demonstrated that the aircraft electric power conforms to MIL-STD-704 by recording steady state and transient power characteristics for voltage (DC and AC), frequency, distortion, DC ripple, and frequency modulation at the terminals of at least 10 representative separate utilization equipments under all operating conditions of the aircraft.

3.7.5.1.4 Emergency electrical power. It shall be demonstrated that the alternate and emergency power systems deliver power conforming to MIL-STD-704, and their rated capacity meets the requirements of the detail specification under all operating conditions. This shall be demonstrated by recording power characteristics at the input terminals of at least five equipments approved by the Test Authority. Additional load banks as necessary shall be installed in the demonstration aircraft to fully load generation and conversion electric power equipment.

3.7.5.1.5 Protection. It shall be demonstrated that the fault protection system meets installation requirements of MIL-W-5088, MIL-F-5372, MIL-C-5809, MIL-F-15160, and the applicable requirements of MIL-STD-454 and MIL-E-7080 as specified in the detail specification.

3.7.5.1.6 Lighting. It shall be demonstrated that the interior and exterior lighting systems, cockpit display systems and indicators, and the integration of internal lighted components comply with MIL-L-18276, MIL-L-85762, and MIL-L-6730 as required by the detail specification.

3.7.5.1.7 Electrical bonding. It shall be demonstrated that all electrical bonding is in accordance with MIL-B-5087 and MIL-STD-1757 with all electrical systems in operation. Measurements shall be performed using resistance and impedance levels specified by MIL-B-5087.

3.7.5.1.8 External power protection. It shall be demonstrated that the external power protection opens the external power control relay control circuit and isolates the aircraft electrical bus from external power when MIL-STD-704 power limits are exceeded.

3.7.5.1.9 Battery discharge. It shall be demonstrated that the battery relay control unit installation meets the requirements of DOD-B-85584 as specified in the detail specification.

3.7.5.1.10 Fuel nozzle grounding. It shall be demonstrated that the fuel nozzle grounding receptacle meets the installation requirements of MS90298 and MIL-C-83413 as specified in the detail specification.

3.7.6 Instrument system. It shall be demonstrated that the operation of all flight and engine instruments is in accordance with the applicable instrument specifications.

3.7.6.1 Pitot and pitot static systems (altimeter and airspeed indicator). The system shall be demonstrated to show compliance with MIL-I-6115 or MIL-P-26292 as specified in the detail specification.

3.7.6.2 Fuel quantity gage systems. The system shall be demonstrated to show compliance with MIL-G-7940 as specified in the detail specification.

3.7.6.3 Compass systems. The system shall be demonstrated to show compliance with MIL-C-7762 as specified in the detail specification.

3.7.6.4 Attitude indicating systems (remote). The system shall be demonstrated to show compliance with the detail specification.

3.7.6.5 Engine power parameter systems. The system shall be demonstrated to show compliance with the detail specification.

3.7.6.6 Engine and flight instrument transmitter mountings, temperature and vibration limit tests. Ground and flight tests shall be performed to demonstrate that the mounting provisions for the engine and flight instrument transmitters do not exceed the temperature and vibration limits of the transmitter specified in the instrument specifications.

3.7.6.7 Angle of attack systems. The system shall be demonstrated to show compliance with the detail specification.

3.7.7 Crew systems and human engineering demonstration.

3.7.7.1 Human engineering and crew station demonstration. The anthropometric limits used for this demonstration shall be as specified in the detail specification. It shall be demonstrated that:

a. Cockpit cabin arrangements, seat adjustment, plugs, and connections are compatible with all configurations (summer/winter/special mission) of aircrew flight clothing and man-mounted flight equipment for all required missions.

b. Cockpit dimensional requirements comply with MIL-STD-1333, and ejection clearances are in accordance with MIL-S-18471 as specified in the detail specification.

c. Design and placement of escape system controls are in accordance with MIL-S-18471 as specified in the detail specification.

d. Manual egress capability and underwater ejection escape performance are in accordance with MIL-S-18471 as specified in the detail specification.

e. Aircrew task and workload is reasonable throughout the primary and secondary missions identified in the detail specification and measured by criteria approved by the acquiring activity. Ground simulation may be utilized if it can be shown to be equivalent to the flight environment.

f. Aircrew task times and accuracies are within specified performance limits and satisfactory to accomplish the aircraft mission requirements.

g. The demonstration shall include the components and subsystems which protect the aircrew (or enhance mission performance) in flight and during threats identified in the detail specification. Hypobaric conditions, thermal extremes, environmental conditions (nuclear, biological, chemical, electromagnetic, vibrating and acoustic), and emergency escape and survival shall be demonstrated.

3.7.7.2 Crew station and cabin conditioning. Cockpit and cabin heating, ventilating, and defogging systems shall be demonstrated to show compliance with MIL-H-18325 as specified in the detail specification with cockpit systems and man-mounted components in use. The test procedure shall be as specified in MIL-T-18606. The adequacy of cockpit and cabin cooling shall be demonstrated on the ground and in flight with the minimum possible heat generating electrical/electronic equipment operating. All tests which demonstrate heating adequacy shall be performed when ground static ambient temperatures are 20 degrees F or less.

3.7.7.2.1 Contamination. Ground and flight tests shall be performed to determine the concentration of contaminants such as carbon monoxide, fuel vapors, gun and rocket gases, gaseous products of combustion, and oil mists. It shall be demonstrated that the limits for fuel vapor concentration and other contaminants (which cause a perceptible odor or irritation or interfere with visibility) comply with MIL-H-18325 and MIL-E-18927 respectively as specified in the detail specification.

3.7.7.2.2 Pressurized aircraft. Cockpit and cabin pressurization, air conditioning, and defogging systems shall be demonstrated to show compliance with the detail specification. The test procedure shall be as specified in MIL-T-18606.

3.7.7.2.3 Non-Pressurized aircraft. Cockpit and cabin heating, ventilating, and defogging systems shall be demonstrated to show compliance with the detail specification. The test procedure shall be as specified in MIL-T-18606.

3.7.7.2.4 Gaseous and liquid oxygen. With the oxygen system, gaseous or liquid, filled to normal capacity, and with full operating equipment aboard, the aircraft shall be flown at the minimum and maximum operational altitudes at which oxygen is required. Under simulated tactical conditions at those altitudes, the oxygen system shall be demonstrated to function properly in accordance with MIL-D-8683 or MIL-D-19326 as specified in the detail specification, as applicable, and to demonstrate adequate freedom of movement of personnel to perform their required duties.

3.7.7.2.5 On-Board Oxygen Generating System (OBOGS). Under simulated operational conditions, the OBOGS shall be demonstrated to function in accordance with MIL-D-85520 as specified in the detail specification. The air supply thermal conditioning shall be demonstrated in flight with static ambient temperature exceeding 90 degrees F. Ground tests to demonstrate the dynamic performance of the OBOGS shall be conducted in accordance with MIL-D-85520.

3.7.7.2.6 Thermal protective system. The nuclear thermal radiation pilot or cockpit protective system shall be demonstrated to show satisfactory operation in accordance with MIL-T-81571 as specified in the detail specification.

3.7.7.2.7 Acoustical noise level. It shall be demonstrated that the acoustical noise level in occupied spaces does not exceed the values specified in the detail specification. All sound attenuation devices or methods shall be employed during the demonstration. All doors, windows, ramps and canopies shall be closed. Sound measurement procedures used for auditory signal transmission and speech intelligibility shall be approved by the Test Authority.

3.7.7.2.8 Anti-g protective system. The anti-g protective system shall be demonstrated to show satisfactory operation within the flight envelope.

3.7.7.2.9 Aviation life support systems. Demonstrations shall be performed on all configurations of aviation life support systems including interfaces with cockpit and other aviation life support systems components. The demonstrations shall ensure capability of the integrated system to perform each mission life support function and shall include:

a. The aircrew automated escape system.

b. Normal and emergency operations of aviation life support systems.

3.7.7.2.10 Parachute and survival equipment assembly. Adequate storage provisions in the seats or other accessible spaces for all required parachutes, pararafts or other survival kits, and emergency oxygen equipment shall be demonstrated. Ground and in-flight demonstrations shall show that storage precludes loss or mislocation of equipment, does not interfere with flight operations, and facilitates equipment use in emergencies. The demonstration shall include use of emergency oxygen during flight, while carrying out representative mission tasks, and egress during simulated ditching, ejection, and bailout conditions. If incorporated as part of the escape system, the demonstration shall be conducted in accordance with MIL-S-18471. Personnel restraint during arrested landing and adequate and proper release features shall be demonstrated. Accommodations for all automatic oxygen and parachute actuation devices shall be demonstrated.

3.7.7.2.11 Emergency manual egress system. Emergency evacuation for simulated post crash conditions (ditching and land crash) and evacuation times shall be demonstrated to show compliance with MIL-STD-1472. Sequence of emergency escape for ditching shall be demonstrated to show compliance with the ditching plan. The adequacy and reliability of

emergency egress markings and lighting systems shall be demonstrated. The simulated post land/crash evacuation demonstration shall be made to show the accessibility and suitability with which escape exits can be located and opened from the inside and the outside of the aircraft for both landing gear up and landing gear down conditions. All evacuation demonstrations shall show the accessibility and adequacy of the emergency escape openings for escaping personnel wearing the flight gear required for the specified missions of the aircraft.

3.7.7.2.12 Automatic life raft release system. Operation of the automatic life raft release system shall be demonstrated on the ground to show compliance with the detail specification.

3.7.8 Miscellaneous installed systems. A miscellaneous installed systems demonstration shall be performed for those systems listed herein which are included in the detail specification. It shall be demonstrated that each miscellaneous installed system is not subjected to vibration or shock loads greater than the limits in the respective system specification.

3.7.8.1 Imaging system demonstration. The passive imaging equipment required by the detail specification shall be demonstrated both on the ground and in-flight.

3.7.8.1.1 Ground check. All passive imagery sensors, magazines, recorders, and associated equipment shall be demonstrated to show:

a. Adequate installation clearances including access for loading and unloading installed imagery sensors, magazines and recorders; testing, operation, and removal of units and components of imaging equipment.

b. Ability to rotate sensors and mounts, if specified.

c. Functional operation of sensors, sensor control systems, viewfinders and other installations, systems, and equipment associated with imaging.

d. Operational suitability of flight line and bench-check equipment, if specified.

e. Proper and safe operation of sensor doors and windows, related bay doors, and illuminant release system, if applicable.

f. Adequate stowage and security of spare imaging equipment, if applicable.

g. Suitability of handling equipment, if applicable.

3.7.8.1.2 Flight check. A flight test shall be conducted to demonstrate:

a. Sensor platform suitability.

b. Operation of the sensor control system, throughout the designed range of the sensor control system but within the design flight envelope of the aircraft and for the sensors being installed.

c. Suitability and operability of the viewfinder, oblique sights, and other sighting equipment for properly positioning imaging targets.

d. Adequacy of sensor doors and windows to afford the sensor a view that is unobstructed by the airframe, dirt, oil film, water condensation, reflection or other deleterious effects.

e. Suitability of sensor compartment temperature, pressurization and vacuum supply; accessibility to and operability of doors, windows, sensor, and associated equipment as applicable.

f. Useability of the images from all installed sensors operated in accordance with b. above, including radar recording and night imaging, as applicable.

g. Adequacy of the initiating, operating, and indicator mechanisms of the sensor control systems.

h. Adequacy of recording equipment, as applicable.

i. Suitability of the automatic pilot to maintain imaging flight line requirements, as applicable.

3.7.8.2 Air-to-air refueling system. The capability and suitability of donor and receiver provisions of air-to-air refueling systems specified in the detail specification shall be demonstrated in accordance with MIL-A-19736. Aircrew visual access requirements specified in the detail specification shall be demonstrated. The following features of air-to-air refueling tanker equipment shall be demonstrated when tanker capabilities are required by the detail specification:

a. Hose and drogue stability.

b. Reel Response.

c. Effects of the tanker wake and external stores on the drogue and the receiver aircraft.

d. Engagement envelope.

e. Static electricity and other environmental effects are not of a degrading nature.

3.7.8.3 Fire warning, bleed air leak detection and fire extinguishing systems and fire/explosion suppression systems. Ground and flight operation of the fire warning system shall be demonstrated to show compliance with MIL-F-23447 as specified in the detail specification. Extinguishing agent concentration level shall be measured in flight.

3.7.8.4 Hydraulic and pneumatic systems. Operation of all hydraulic and pneumatic system installations (in flight and on the ground as applicable) and the accessibility and suitability of external hydraulic and pneumatic power connections shall be demonstrated in accordance with MIL-T-5522.

3.7.8.5 Ice protection systems. It shall be demonstrated that the ice protection system (anti-ice and de-ice) operates satisfactorily in the icing conditions specified in the detail specification. The icing survey test shall include the following:

a. Increase in power required as a function of ice accretion.

b. Capability of the engine air induction system to maintain maximum air flow and ensure against ice ingestion.

c. Capability of the windshield to maintain visibility requirements.

d. Aircraft controllability.

e. Heat transfer performance of the anti-ice and de-ice systems.

f. Assessment of structural damage due to ice shedding.

g. Vibration levels during de-ice system cycling.

h. Proper operation of all ice protection system equipment and controls.

3.7.8.5.1 Thermal anti-ice systems. These systems shall be demonstrated to show compliance with MIL-T-18607 as specified in the detail specification.

3.7.8.5.2 Pneumatic anti-ice systems. These systems shall be demonstrated to show compliance with MIL-S-8512 as specified in the detail specification.

3.7.8.5.3 Fluid anti-ice systems. These systems shall be demonstrated to show compliance with the detail specification.

3.7.8.6 Rain removal systems. These systems shall be demonstrated to show compliance with the detail specification and MIL-T-5842. The conditions for demonstration shall be as specified in the detail specification.

3.7.8.7 Watertightness. Watertightness (including all systems) shall be demonstrated both on the ground and in flight to show compliance with MIL-W-6729 as specified in the detail specification.

3.7.8.8 Airframe movable components and sub-systems. Operation of all movable airframe components (e.g.,flaps, enclosures, wing folding, slats, speed reduction devices, and landing gear) shall be demonstrated at the design limits required for such items. The time required for operation shall be recorded.

3.7.8.8.1 Wing folding or sweeping and spreading (ship-based aircraft). Fold, sweep, or spread of wings shall be demonstrated to show compliance with the detail specification.

3.7.8.8.2 Landing gear.

3.7.8.8.2.1 Retraction and extension. The following landing gear operations shall be demonstrated to show compliance with the detail specification:

a. Time for retracting and locking after takeoff.

b. Extension and locking at maximum airspeed.

c. Emergency extension.

d. Proper functioning of the gear warning system.

3.7.8.8.2.2 Nose gear steering. The nose gear steering system shall be demonstrated to show compliance with the requirements of the detail specification.

3.7.8.8.2.3 Brakes. The ability of the brakes to prevent rotation of the wheels under the conditions of full military power/maximum thrust and maximum takeoff gross weight, with the aircraft parked on a dry concrete surface, shall be demonstrated. The ability of the brakes to retard the aircraft to a safe stop after high-speed landings, without tire and wheel explosion, shall be demonstrated with anti-skid both "ON" and "OFF." With anti-skid "ON," the ability of the brakes to retard the aircraft to a safe stop after high-speed landings shall be demonstrated on a concrete runway with each alternate 50 foot length of runway thoroughly soaked with water. Runway length shall be compatible with mission requirements. The ability of the brakes to conform to a turn-around time as specified in the detail specification shall be demonstrated. Power off braking capability shall be demonstrated for carrier deck spotting and maneuvering. The emergency brake control system shall be demonstrated.

3.8 Reliability and maintainability demonstration.

3.8.1 Reliability and maintainability. A Reliability and Maintainability (R&M) demonstration shall be conducted to show that the aircraft meets the reliability, maintainability, and Built-In-Test (BIT) requirements specified in the detail specification. This test may be performed in combination with or in addition to structural, aerodynamic, propulsion, shipboard trials, installed systems testing, etc. Any R&M test completed and properly witnessed by the Test Authority in accordance with the R&M Demonstration Test Plan, but prior to the scheduled test, shall be included in the Demonstration Planning and Progress Reports and may be proposed as fulfilling demonstration requirements.

3.8.1.1 Testability demonstration. A testability demonstration shall be performed in conjunction with the maintainability demonstration required in 3.8.1. Testability data collection and analysis planning shall be performed in accordance with Task 103, MIL-STD-2165 and the Support Equipment (SE) chapter of the Integrated Logistic Support Detail Specification (ILSDS). This requirement shall be included in the R&M Demonstration Test Plan.

3.8.2 Aircraft changes. After release for reliability and maintainability test, no changes shall be made without the approval of the acquiring activity.

3.8.3 Test flights. The mission profiles specified in the detail specification shall be flown during the R&M demonstration. R&M data shall be collected during pre-flight checks, throughout the flight, and during post-flight ground testing and maintenance and shall be in accordance with the requirements of the detail specification, OPNAVINST 4790.2, MIL-STD-470, MIL-STD-471, and MIL-STD-785.

3.8.3.1 Maintenance. In-flight equipment maintenance shall be performed only when necessary to restore the aircraft to a minimum acceptable condition for crew safety or as permitted by approved Navy operator maintenance procedures. All maintenance performed between R&M flights shall be accomplished by a maintenance crew whose composition shall be limited to the number and qualifications equivalent to those specified for Navy personnel. All support equipment to be used during the R&M BIT test shall be that planned and specified for use with the aircraft in its service environment.

3.8.4 R&M data and review. Organizational level reliability, maintainability, and built-in test parameters on all aircraft equipment required to meet the specification R&M requirements shall be monitored during the entire flight test program. A joint contractor and Navy R&M review board shall determine the relevancy of the data used in evaluating compliance to specification R&M requirements in accordance with Navy approved procedures.

3.8.5 Support demonstration. Compatibility between the aircraft and its systems and all recommended and specified support equipment shall be demonstrated. A performance, operability, reliability, maintainability, and testability demonstration shall be performed for all peculiar support equipment. All support equipment required for organizational and intermediate maintenance levels shall be demonstrated, and all organizational level support equipment and systems shall be of production configuration suitable for Fleet use.

3.8.5.1 Supportability demonstration. Demonstration of supportability characteristics shall be in accordance with the supportability assessment plan developed as an output of Task 501 of MIL-STD-1388-1.

3.8.6 Accessory equipment All accessory equipment shall be demonstrated to show compliance with the detail specification.

3.8.6.1 Winches and hoists. Winches and hoists shall be operated through at least six cycles at their maximum rated capacity. Operation of remote controls shall be demonstrated.

3.8.6.2 Cargo carrying and handling. All cargo carrying, handling, and securing equipment shall be demonstrated to their rated capacities.

3.8.6.3 Tie-down, jacking, and towing. Tie-down, jacking and towing provisions shall be demonstrated.

3.8.6.4 Hoisting sling. Operation of the hoisting sling shall be demonstrated.

3.9 System safety demonstration. The contractor shall demonstrate compliance with the safety requirements of MIL-STD-882 for critical hardware, software, and procedures. Where hazards are identified and it cannot be determined by analysis or inspection whether the corrective action will adequately reduce the risk, safety tests shall be conducted to evaluate the effectiveness of the corrective actions. The analysis or demonstration tests shall include verification of the safety or warning devices. Induced or simulated failures shall be considered to demonstrate the failure mode and acceptability of safety critical equipment and software. These tests shall be performed in combination with or, if necessary, in addition to other demonstration tests.

3.10 System survivability/vulnerability demonstration. The survivability demonstration shall include evaluation of characteristics and performance requirements as specified in the detail specification. The survivability demonstration shall include measurement of the system's susceptibility to being detected, tracked, and hit by enemy weapon systems because of each of its specific observables, e.g., radar signature, IR signature, acoustic signature, intentional and unintentional emissions, visibility, or other observables specified in the detail specification.

3.10.1 Susceptibility demonstration. The ability of the aircraft to avoid being detected, tracked, or hit by enemy weapon systems, as required by the detail specification, shall be demonstrated.

3.10.1.1 Radar signature measurement. Radar Cross Section (RCS) shall be measured to demonstrate compliance with the detail specification requirements.

3.10.1.2 Infrared radiation. Infrared measurement of the aircraft in-flight shall be conducted to demonstrate compliance with the detail specification requirements. The contractor shall arrange with the cognizant infrared measurement facility/activity in sufficient time to permit scheduling of aircraft and ground facilities equipped for IR measurement. The infrared measurement shall be made during a dedicated period; no other tests shall be conducted concurrently.

3.10.1.3 Acoustic signature. Acoustic signature shall be measured to demonstrate compliance with the detail specification requirements.

3.10.1.4 Intentional and unintentional emissions. System emissions both intentional and unintentional from electrical, electromagnetic or other components shall be measured to demonstrate compliance with the detail specification requirements.

3.10.1.5 Visible, UV, and other short wavelength phenomena. Detectability by emission or reflection of energy in wavelengths of 0.7 micrometers and shorter, as required by the detail specification, shall be demonstrated.

3.10.1.6 Countermeasures demonstration. The effectiveness of electronic or other device required by the detail specification that reduces or deters the enemy's ability to inflict an attrition or mission kill upon the system shall be demonstrated.

3.10.2 Vulnerability reduction demonstration. The combat/operational suitability of the aircraft in terms of its ability to withstand the anticipated mission threat environment specified in the detail specification shall be demonstrated.

3.10.2.1 Ballistic and warhead tolerance demonstration. The ability of the system to withstand the projectiles, fragments, and warheads specified in the detail specification shall be demonstrated by live fire tests.

3.10.2.2 Nuclear hardness and hardness assurance demonstration. Hardness to nuclear effects such as blast, gust, thermal, Electromagnetic Pulse (EMP), or initial ionizing radiation (Transient Radiation Effects to Electronics (TREE), etc.) required by the detail specification shall be demonstrated. Hardness assurance shall be demonstrated.

3.10.2.3 Special vulnerability equipment demonstrations. Special equipment required by the detail specification to reduce or prevent threat effects on the system such as fire and explosion suppression systems, directed energy weapon protective devices, NBC filters, armored or special clothing, etc. shall be demonstrated.

3.10.2.4 Nuclear, Biological and Chemical (NBC) warfare suitability demonstration. The ability of the system to perform its mission essential functions under NBC warfare conditions required by the detail specification shall be demonstrated. This shall include intrusion tests, over pressure system/ECS filter system test, operability/maintainability in NBC protective ensembles, and decontamination.

3.10.2.5 Hardness to directed energy and other specified weapons demonstration. Hardness, as specified in the detail specification, to directed energy and other weapons shall be demonstrated.

3.11 Reports.

3.11.1 Format and general requirements. Reports required by this specification shall conform with the format and general requirements of ANSI Z39.18 and the following:

a. Reports of test results shall describe how and to what extent the tests were observed by representatives of the cognizant Test Authority.

b. Revised material shall bear the same page numbers as the pages that are to be replaced, plus the word "revised" and the date of the revision. The revised subject matter shall be identified. Added pages shall bear the same number as the preceding page, followed by a lower case letter unless the additional pages follow the last page of the report.

c. Symbols, abbreviations, and units, if they do not appear in standard lists of aircraft nomenclature, or in documents listed herein pertaining to the material in the report, shall be defined in a separate table of definitions.

d. Reports shall be bound in a manner that will facilitate removal, addition, or replacement of pages without the use of special devices.

e. Reports of more than 10 pages shall be indexed.

f. Contents of the Demonstration Report shall be sectionalized so data concerning each principal category, e.g., aerodynamics, structures, propulsion, armament, carrier suitability, etc., are presented on consecutive pages that may be separated from the data concerning other categories. This does not apply to the index.

g. The high AOA/Spin Demonstration Schedule Reports may be combined with the Demonstration Planning and Progress Report provided the data are presented on consecutive pages which may be separated from the basic report. Time histories of all AOA demonstration maneuvers shall be included. A summary of characteristics shall also be included but shall not replace the time history data.

3.11.2 Submission of reports. Reports listed herein shall be submitted in accordance with the CDRL. Acceptance of reports, or revisions or additions thereto, or waiving a report or a specified demonstration test, shall not be construed to be a waiver of compliance with the detail specification or any other provision in the contract.

3.11.3 Required reports.

3.11.3.1 Demonstration Program Plan. This is a one time submission. After approval, proposed changes to the plan shall be submitted in the Demonstration Planning and Progress Report.

3.11.3.2 Demonstration Planning and Progress Report. This report shall contain comprehensive up-to-date information concerning the planning for the demonstration program, and the relationships between demonstrations and other "proof-of-design" requirements and planned aircraft deliveries. Parts of the report containing the information specified in a. through e. shall be submitted concurrently with

the submittal of the Demonstration Instrumentation Report. Subsequently, at intervals not exceeding two months, additional and/or revised pages shall be submitted as necessary to furnish as much of the information specified in f. through k. as possible and to keep submittal material up-to-date. If, at the end of any two-month period, added or revised pages are not necessary to make the report up-to-date, a statement to that effect shall be submitted. The report shall include the following:

a. Planned dates for performance of proof-of-design tests and for submittal of data, that are prerequisites for proceeding with various demonstration tests.

b. Planned dates for performance of demonstration tests with each of the demonstration aircraft.

c. Planned dates for DT-II evaluations by Navy pilots.

d. Demonstration schedule for each phase of the demonstration (i.e., structural, aerodynamic, propulsion, carrier suitability, etc.). This schedule shall describe the tests to fulfill the demonstration requirements and the paragraph relationship between tests and demonstration requirements.

e. Schedule of aircraft delivery for TECHEVAL, OPEVAL and to the Fleet.

f. Dates of actual performance of the various takeoff, flight, landing, carrier suitability, and ground demonstration tests including buildup tests.

g. Operating limits for flight for contractor and Navy pilots.

h. The following information as applicable:

1. All structural design gross weights and their derivation using updated weight data. Also weight, and weight breakdown and center-of-gravity positions for all demonstration configurations.

2. Aerodynamic and structural design envelopes, and limits of aircraft gross weight versus center-of-gravity position.

3. Level-flight and limit dive speeds.

4. Catapult limit load factor and limit tow load.

5. Arresting limit load factor, limit hook drag and side load, and the envelope of design sinking speeds, pitch angles, and roll angles for carrier-based aircraft.

6. Sinking speeds and pitch and roll angles for land based aircraft.

7. Stall speeds, power-on and power-off, versus gross weight in basic, landing, and other pertinent configurations.

8. Determination as to whether V_{max} is limited by actual strength, control power, flight characteristics, or other parameters.

9. Planned flight envelopes for Navy Development Tests.

10. Landing gear strength envelopes and source or method of derivation. Such envelopes shall be based on existing strength as substantiated by tests and supplemented, if necessary, by analytical methods.

11. Curves of aircraft gross weight versus center of gravity position for extreme aft and forward loadings and demonstration test loadings.

12. For each store station, a table listing all the allowable stores, pylons, racks, and their respective weights.

13. Store carriage design limit load for take off, landing and flight.

i. *Summaries of safe boundaries of flight conditions performed* during flight tests including the following:

1. The test data of equivalent airspeed and Mach number for the report period shall be denoted as points with appropriate corrections plotted on design V-n diagrams for sea level and every ten thousand foot increment of altitude up to the service ceiling. Information previously reported for each of the altitudes shall be indicated by shaded areas connecting their outer boundaries.

2. Information regarding high-speed and low-speed rolling pull outs (equivalent airspeed and load factor) and high-speed and low-speed steady sideslip (equivalent airspeed and rudder-pedal force) shall be presented in tabular form indicating the most severe maneuvers, shown by flight test to date, that can be safely achieved.

3. A curve indicating the variation of lift coefficient with Mach number based on the stall, static longitudinal instability, undesirable buffet intensity, or other characteristics which limit the useful lift capabilities of the aircraft. In a like manner, a curve for the aircraft with stores shall be included.

j. Discussion of any required demonstration tests that the contractor has concluded cannot be performed in the manner or to the conditions specified, with amplifying information regarding design deficiencies involved or other reason for the conclusions. This information shall summarize action taken or contemplated to eliminate the deficiencies and whether or not the contractor is

able to solve design problems posed by the disclosed design deficiencies.

k. Description of aircraft proposed to be used in the performance of the structural demonstration (takeoff, landing, and taxi tests for land-based and carrier-based aircraft, and dives and pull-outs). If structurally, aerodynamically, and functionally identical with aircraft planned to be delivered for TECHEVAL, OPEVAL, and to the Fleet, a statement to that effect should be submitted in lieu of detailed descriptions. Otherwise the structural, aerodynamic, and functional differences shall be completely described and the effects of these differences on the proof-of-design aspects of the structural demonstration shall be summarized. This applies particularly to special provisions in demonstration aircraft which are not to be in service aircraft, such as special cockpit control restrictors; special test instrumentation, special escape provisions; ballast in lieu of useful load, modification to standard stores mounts; and those affecting strength and rigidity, flying qualities, or performance.

3.11.3.3 Instrumentation reports.

3.11.3.3.1 Demonstration Instrumentation Report. This report shall be sectionalized by demonstration categories, e.g., aerodynamics, structures, propulsion, etc., and shall contain:

a. A complete list of the demonstration items for which each instrument will be used.

b. A complete list of variables to be measured with each aircraft, the expected overall accuracy of measurement of each variable, and a discussion of expected errors resulting from time delays or phase shifts between measured parameters.

c. Complete list of Government-furnished and contractor-acquired Special Flight Test Instrumentation (SFTI). This list shall identify the instrumentation as to purpose, function, location, and response characteristics required.

d. Estimated dates for completing installation of instrumentation in each aircraft.

e. Detailed description of all instrumentation and related systems and all final calibration data for each aircraft. This information may be submitted as an appendix to the report no later than three weeks prior to the time the aircraft is scheduled to arrive at the test site.

f. Sufficient data on the total instrumentation system to ensure that:

1. No degradation of performance results from extraneous noise, vibration, shock or temperature.

2. Flat frequency response commensurate with the parameter to be measured.

3. Effects of time delays or phase shifts between measured parameters are commensurate with the accuracy requirements of the test program.

3.11.3.3.2 Structural Instrumentation Report. This report shall contain a complete description, location, and any special calibration method or requirements for each aircraft planned for use in the demonstration.

3.11.3.3.3 Special Flight Test Instrumentation (SFTI) Inventory and Status Report. This report shall provide the inventory listing and status of Government-furnished and contractor-acquired SFTI in custody of the contractor, and shall contain the serial number, nomenclature, model number, range, manufacturer, cost, date equipment was acquired, present location, aircraft or contract to which assigned, date equipment was assigned to this contract and current status of each item of SFTI.

3.11.3.3.4 Special Flight Test Instrumentation (SFTI) Excess Equipment Report. This report shall be submitted at the time the Government-owned SFTI becomes excess. Disposition instructions shall be requested. This report shall contain the serial number, nomenclature, manufacturer's model number, range, manufacturer, cost, date equipment was acquired, present location, aircraft or contract to which assigned, date equipment was assigned to this contract and status of each item of excess SFTI.

3.11.3.3.5 Special Flight Test Instrumentation (SFTI) Requisition and Technical Report. This report shall include:

a. Requisition and Invoice/shipping Document (DD Form 1149) shall be submitted when SFTI is initially acquired under the contract and shall contain the contract and program to which the SFTI is assigned, the nomenclature, model number, serial number, range, and date acquired for each item of SFTI. It shall be submitted when SFTI is initially acquired under the contract.

b. Documentation on each model of contractor-acquired SFTI shall contain operating procedures, applicable preventive maintenance procedures, and physical and performance specifications.

3.11.3.4 Daily Flight Reports. Daily reports shall be submitted for the first 20 flights of each of the first two demonstration aircraft after which they may be discontinued by the acquiring activity upon request. These reports shall be submitted as expeditiously as possible and within 48 hours after completion of flights, except when additional delay is essential to the presentation of data. These reports may be brief and informal, need not be forwarded by formal correspondence, and shall include the following:

a. Daily flight report number.

b. Model designation.

c. NAVAIR serial number.

d. Contract number.

e. Date of flight.

f. Pilot's name.

g. Duration of flight.

h. Loading condition.

i. Gross weight.

j. Purpose of flight (and program if a series of flights is involved).

k. Center-of-gravity location.

l. Changes prior to flight.

m. Discussion, including pilot observations, concerning any phenomena encountered such as unusual or unexpected flight characteristics, yielding or failure of a region of the structure, flutter including control-surface buzz, or any other unusual occurrence shall be included. Observations of the operation of the installed aircraft weapon system equipment shall be discussed, if applicable.

3.11.3.5 Bi-Weekly Summary Reports. These reports shall be brief and informal and shall contain qualitative and preliminary quantitative data (quantitative data for aerodynamic tests only) obtained during the reporting period. If time will not permit quantitative data obtained during the latter part of the reporting period to be included, it shall be included in the next Bi-Weekly Summary Report, and final data shall be submitted in the Demonstration Report. The Bi-Weekly Summary Report shall summarize the purposes of the tests and significant results obtained from the tests, including pilot comments where applicable. Quantitative data shall be included to cover typical aerodynamic test results sufficient to define problem areas and/or aerodynamic characteristics not previously reported. The Bi-Weekly Summary Report shall also describe the configuration of the aircraft including photographs and sketches of aerodynamic modifications tested during the reporting period. For the duration of the structural dynamic flight tests, separate bi-weekly data reports shall be submitted and prepared in accordance with MIL-A-8868. Each report shall be submitted not later than seven calendar days following the end of the reporting period.

3.11.3.6 Demonstration report. The report shall include all tests performed one month prior to the date of the report. This report shall include:

a. Pertinent data observed or recorded during test. For the structural demonstration tests, the measured values for each maneuver including plotted time-history data from initiation to recovery. Data shall be plotted within strength envelope plots, data shall be cross-plotted to develop critical load trend information, and data shall be plotted verses airspeed and Mach number. Complete discussions shall be included of any buffeting, flutter, excessive vibration, control-surface buzz, or unusual response of the aircraft or component encountered during the test. For tests relating to flying qualities, only data for typical tests conditions shall be presented. The data presented shall depict trends or support stated conclusions. Summary data showing variations of stability and control parameters with Mach number, altitude, etc., and comparisons with predicted derivatives shall be presented if available. The data shall be presented so as to clearly separate demonstration data from other data.

b. Conditions of loading.

c. Catapult spotting conditions, when applicable.

d. Arresting conditions, when applicable.

e. Approach speeds, when applicable.

f. Engaging speeds, when applicable.

g. Changes incorporated.

h. Data obtained during performance demonstration tests shall be included. Methods and procedures for determination of each performance item as well as related information such as airspeed position error, ambient temperature, engine thrust, etc. shall be adequately described. Methods and calculations used in the reduction of observed data to standard conditions and in the adjustment of these data to specification conditions shall be presented.

i. A compilation of the test points and methods employed in calibrating (to 100 percent design limit load) all structural load, load factor, stress, or temperature measuring devices.

j. Quantitative comparison of the results of dynamic analyses for predicting time histories of loads and motions, and the maximum loads measured during the land-based and carrier-based takeoff, landing and taxi tests, and the landing gear drop tests. The carrier landing tests shall include the superposition of deck-obstruction loads. The foregoing comparison shall be shown in relation to the strength envelope of the aircraft, such envelopes to be determined by a combination of analyses and static test. These comparisons shall be summarized to show that the aircraft has structural reliability for the design envelope.

k. Quantitative comparisons of the measured structural flight test loads and stresses shall be made with design loads and stresses for the purpose of substantiating critical design loads, load trends, and the analyses baseline. Comparison shall include both static and dynamic flight loads. Time histories shall be used where applicable.

l. Quantitative test results and a discussion of the methods used to determine the accuracy of the weapon delivery system.

3.11.3.7 Pre-engineering report. If the bulk of the data required prior to Navy DT-II evaluations has been submitted in the Demonstration Data Report, a supplemental data report shall be submitted. Otherwise a separate report shall be submitted for each applicable phase, i.e., DT-IIA, B, C, etc., and TECHEVAL.

3.11.3.8 Structural Demonstration Test Plan. The Structural Demonstration Test Plan shall include all phases of the structural demonstration.

3.11.3.9 Structural pre-flight load survey report. This report shall contain a summary of buildup flight tests to date, aircraft configuration to be used for the survey, and planned maneuvers and critical parameters to be surveyed.

3.11.3.10 Structural flight loads survey report. This report shall contain sufficient data to show that the critical components and conditions were tested to the limits for the design. Data from all flight tests shall be included.

3.11.3.11 Structural flight limitations report. This report shall contain the summary of the maneuvers conducted for the structural flight limitation tests and the structural development flight testing. If tests from the structural flight loads survey program are applicable, the report should so state and present data.

3.11.3.12 Pre-structural demonstration report. This report shall contain those critical parameters and maneuvers selected from Table IC with supporting data or appropriate reference to data from the structural flight loads survey and flight limitation tests.

3.11.3.13 Structural demonstrations report. This report shall contain the results of the tests required from Table IC.

3.11.3.14 Structural dynamic flight demonstration reports. Reports shall be prepared and submitted in accordance with MIL-A-8868 for the structural dynamic flight demonstration. These reports shall include:

a. Aeroelastic stability, vibration, and aeroacoustic flight test planning report.

b. Aeroelastic stability flight test letter report(s).

c. Vibration and aeroacoustic flight test letter report(s).

d. Aeroelastic instability, vibration, or sonic-fatigue occurrence report(s), whenever applicable.

e. Aeroacoustic environment ground test report.

f. Vibration environment measurement report.

g. Aeroacoustic environment measurement report.

3.11.3.15 Structural flight test anomaly and failure report. A report shall be prepared in accordance with MIL-A-8868 and submitted after a structural flight test anomaly or failure such as overload, fatigue (including sonic or vibration induced), aeroelastic instability, or aeroservoelastic instability has occurred during ground or flight testing.

3.11.3.16 Structural ground loads and carrier suitability demonstration report. The report shall summarize the results of the structural ground loads and carrier suitability demonstration.

3.11.3.17 Aerodynamic demonstration test plan. This plan shall include all phases of the aerodynamic demonstration including the performance demonstration.

3.11.3.18 Flying qualities demonstration report. This report shall contain quantitative data and qualitative information from the flight test and demonstration program.

3.11.3.19 High AOA/spin demonstration schedule reports.

3.11.3.19.1 Spin demonstration schedule report. This report shall include anticipated spinning characteristics based on model tests and analyses and shall present details of the proposed spin testing program. Those cases where the contractor considers modification to the basic spin program to be necessary shall be discussed in this report.

3.11.3.19.2 High AOA/spin demonstration report. This report shall summarize the results of the flight test program and include proposed wording for the high AOA/spin information to be presented in the NATOPS Flight Manual. This report shall contain the following for each demonstrated maneuver: gross weight, general arrangement of loading, center-of-gravity, moments of inertia, locations of principal axes, gear and flap position, starting altitude, method of entry, power conditions, turns of spin executed before applying recovery controls, nature of the steady spin, time per turn, altitude loss per turn, control positions and maximum forces during recovery, altitude loss in recovery, time histories (from initiation of spin through recovery to level flight) of control positions and forces, airspeed, altitude, normal acceleration, angles and rates of pitch, roll and yaw, angles of attack and sideslip. Additional time histories of significant buildup maneuvers which the contractor considers to be of value to the report shall be included. The report shall also describe the emergency spin recovery device including photographs.

3.11.3.20 Performance data-reduction report. This report shall describe data reduction methods to be used during the aerodynamic demonstration tests including identification of and procedures for satisfying proposed performance requirements by mathematical formulation as discussed in 3.3.4.2.1.1.

3.11.3.21 Guaranteed performance report. This report shall summarize the individual and cumulative effects on contract guarantees for the performance demonstration airplane for:

a. Each change covered by change order or other contract document and all other pending changes which are under negotiation but are not yet covered by final contractual action. This includes all changes, each of which, individually, has been determined to have "negligible effects" on contract performance guarantees. The NAVAIR Aircraft Change Control Board number, if applicable, and the nature of change shall be indicated for each separately listed change.

b. Any change in engine rating.

c. Any overweight or underweight of Government-Furnished Equipment (GFE).

3.11.3.22 Performance demonstration report. This report shall present the results of the performance demonstration. Methods and procedures for determination of each performance item shall be included.

3.11.3.23 Propulsion system demonstration test plan. This plan shall detail the contractor's proposed demonstration plan.

3.11.3.24 Engine installation vibration test plan. This report shall present a description of the test program planned to demonstrate the vibration characteristics of the power plant installation.

3.11.3.25 Engine vibration survey report. This report shall present the results of the power plant vibration survey.

3.11.3.26 Engine temperature survey report. This report shall present the results of the power plant temperature survey.

3.11.3.27 Compressor inlet and turbine outlet pressure survey report. This report shall present the results of the compressor inlet and outlet pressure survey.

3.11.3.28 Propulsion system demonstration report. This report shall summarize the results of the demonstration.

3.11.3.29 Propeller vibration survey report. This report shall present the results of the propeller vibration survey.

3.11.3.30 Armament system demonstration test plan. This plan shall detail the proposed demonstration plan.

3.11.3.31 Gunfire vibration and aeroacoustic environment measurement report. This report shall present the results of the gun fire vibration and aeroacoustic environment tests.

3.11.3.32 Missile vibration and aeroacoustic environment measurement report. This report shall report the results of the missile vibration and aeroacoustic environment measurement tests.

3.11.3.33 Aircraft weapon system accuracy report. This report shall contain quantitative test results and a discussion of the methods used to determine the accuracy of the aircraft weapon system.

3.11.3.34 Armament demonstration report. This report shall summarize the results of the demonstration program.

3.11.3.35 Carrier suitability demonstration test plan and schedule. This plan shall present the proposed tests to be conducted and a schedule for the conduct of the tests.

3.11.3.36 Jet blast deflector acoustic and thermal environment report. This report shall present the results of the catapult aeroacoustic and thermal environment tests.

3.11.3.37 Flight Control System demonstration report. This report shall present the results of the carrier suitability demonstration of these systems.

3.11.3.38 Carrier suitability demonstration report. This report shall summarize the results of all phases of the demonstration.

3.11.3.39 Avionic system demonstration test plans. These plans shall present the proposed tests to be conducted on the avionic system and shall include:

a. An Avionic System Performance Demonstration Test Plan.

b. An Avionic System Reliability Demonstration Test Plan.

c. An Avionic System Maintainability Test Plan.

3.11.3.40 Avionic system demonstration reports. These reports shall present the results of the avionic demonstration tests.

3.11.3.41 Electromagnetic Compatibility (EMC) demonstration test plan. This plan shall present the proposed tests to be conducted to demonstrate the electromagnetic compatibility of the aircraft weapon system.

3.11.3.42 Electromagnetic Compatibility (EMC) demonstration report. This report shall present the results of the EMC demonstration and shall identify those equipments not in compliance with MIL-E-6051.

3.11.3.43 Electrical system demonstration test plan. This plan shall present the proposed tests to be conducted on the electrical system.

3.11.3.44 Electrical system demonstration report. This report shall include the following:

a. Up-to-date copies of all electrical wiring diagrams showing cable designations and lengths.

b. A description of the electrical system operation during normal, emergency, and ditching procedures.

c. An electrical load analysis (AC and DC) compiled in accordance with MIL-E-7016. A description of the instrumentation and procedures used in conducting the analysis and measurements.

d. Data, methods, and instrumentation pertaining to the flight and ground evaluations of the capabilities of the electrical system. These reports shall contain a comprehensive discussion of the results obtained and emphasize any operational limitations imposed by the system design. The discussion and data shall be sufficient to judge the validity of the conclusions reached.

3.11.3.45 Instrument systems demonstration plan. This plan shall present the proposed tests to be conducted on the instrument system.

3.11.3.46 Instrument systems demonstration report. This report shall present the results of the instrument system demonstration.

3.11.3.47 Crew systems and human engineering demonstration test plan. This plan shall present the proposed tests to be conducted in areas of crew systems and human engineering.

3.11.3.48 Crew systems and human engineering demonstration report. This report shall present the results of the crew systems and human engineering demonstration tests.

3.11.3.49 Miscellaneous installed systems demonstration test plan. This plan shall present the proposed tests to be conducted on the miscellaneous installed systems.

3.11.3.50 Miscellaneous installed systems report. This report shall present the results of the miscellaneous installed systems demonstration tests.

3.11.3.51 Icing survey test plan. This plan shall present the proposed tests to be conducted on the icing prevention system.

3.11.3.52 Icing survey report. This report shall present the results of the icing survey.

3.11.3.53 Reliability and maintainability demonstration test plan. This plan shall present the proposed tests to be conducted to verify that the reliability and maintainability levels in the detail specification are achieved.

3.11.3.54 Reliability and maintainability demonstration report. The report shall contain comprehensive discussion of the results obtained and shall emphasize any operational limitations imposed by the aircraft design. The report shall include data, a description of instrumentation,

and methods pertaining to the flight evaluation, testability demonstration results, and a comparison of the results with the BIT/BITE performance and diagnostic requirements in the detail specification. The discussion and data shall be sufficient to judge the validity of the conclusions presented in the report.

3.11.3.55 Support demonstration test plan. This plan shall present the proposed tests to be conducted to verify compliance with the detail specification.

3.11.3.56 Support demonstration report. This report shall present the results of the support demonstration.

3.11.3.57 Accessory equipment demonstration test plan. This plan shall present the proposed tests to be conducted on the accessory equipment.

3.11.3.58 Accessory equipment demonstration report. This report shall present the results of the accessory equipment demonstration.

3.11.3.59 System safety demonstration test plan. This report shall present the proposed tests to be conducted to verify that an adequate safety level has been achieved.

3.11.3.60 System safety demonstration report. This report shall present the results of the system safety demonstration tests.

3.11.3.61 Safety assessment report. This report shall present the results of the safety assessment made in accordance with task 209 of MIL-STD-882.

3.11.3.62 Combat survivability demonstration test plan. A test plan shall be prepared for each survivability demonstration test. Each test plan shall include:

a. A detailed test description showing how each of the survivability requirement of the detail specification will be demonstrated.

b. A cross reference matrix or narrative showing the relationship of the required demonstration to developmental or verification tests.

c. A description of the demonstration criteria and associated measurement methods and specific details of the test describing instrumentation, loading, velocities, altitudes, observers, etc.

d. A detailed schedule showing demonstration dates and their relationship to critical design and other demonstration milestones. Test plans shall be cross referenced to the Survivability Program Plan.

3.11.3.63 Combat survivability demonstration test report. This report shall provide, for each individual demonstration, a summary of the test results, test conditions, significance, conclusions, recommendations, and data gathered.

4. QUALITY ASSURANCE PROVISIONS

This section is not applicable to this specification.

5. PACKAGING

This section is not applicable to this specification.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. This specification specifies the tests which shall be performed for Naval aircraft prior to the TECHEVAL performed by the Navy and certification of readiness for Operational Evaluation (OPEVAL).

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of the specification.

b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).

6.3 Data requirements. The following Data Item Descriptions (DID's) shown in Tables VI and VII (see appendix B) must be listed, as applicable, on the Contract Data Requirements List (DD Form 1423) when this specification is applied on a contract, in order to obtain the data, except where DOD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423. The DID's listed in Tables VI and VII were those cleared as of the date of this specification. The current issue of DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID's are cited on the DD Form 1423.

6.3.1 Completing the CDRL. The types of data listed in Tables VI and VII represent the expected results of investigations and tests usually performed in the development of aircraft weapon systems. The Data Item Description cited is listed only for guidance in preparing the CDRL and may be substituted. AVOID DUPLICATION OF DATA.

6.4 Definitions. The following definitions are defined for use or reference herein.

6.4.1 Active control. A control system where aircraft motion and control surfaces provide feedback by means other than by direct manual forces to the pilot input.

6.4.2 Aircraft/store compatibility. The ability of the aircraft and stores carried to coexist under specified conditions without detrimental or adverse effects of either upon the aerodynamic, structural, structural dynamics, or functional characteristics of the other, including operational or emergency separation of the stores from the aircraft. The specified conditions are usually those conditions normally experienced, or expected to be experienced, by the aircraft involved.

6.4.3 Angular velocity. Rotational velocity about the respective aircraft axis.

6.4.4 Bucking. Uncommanded pitching oscillation.

6.4.5 Calibrated Air Speed (CAS). The indicated air speed corrected for installation and instrument errors.

6.4.6 Classification of aircraft. An aircraft shall be placed in one of the following classes:

Class I - Small, light aircraft such as:

Light utility
Primary trainer
Light observation

Class II - Medium weight, low-to-medium maneuverability aircraft such as:

Heavy utility/search and rescue
Light or medium transport/cargo/tanker
Early warning/electronic countermeasures/airborne command, control, or communications relay
Antisubmarine
Assault transport
Reconnaissance
Tactical bomber
Heavy attack
Trainer for Class II

Class III - Large, heavy, low-to-medium maneuverability aircraft such as:

Heavy transport/cargo/tanker
Heavy bomber
Patrol/early warning/electronic countermeasures/airborne command, control or communications relay
Trainer for Class III

Class IV - High maneuverability aircraft such as:

Fighter/interceptor
Attack
Tactical reconnaissance
Observation
Trainer for Class IV

6.4.7 Contractor's plant. Contractor's plant is defined as the contractor's flight-test facilities.

6.4.8 Control, abrupt displacement of. Where these specifications require an abrupt displacement of controls by application of a specified force or displacement in a specified time interval, it is not required that hinge moments, power or boost system maximum rates, or maximum displacements as available, be exceeded.

6.4.9 Control, direct lift. That control which provides for a vertical translational motion with zero angular velocity or acceleration.

6.4.10 Control, direct side force. That control which provides for a lateral translational motion of the aircraft with respect to its longitudinal axis.

6.4.11 Control force, maximum lateral. That control which provides a maximum force in the lateral direction applied normal to the control stick; for wheel control, a couple in the plane of the wheel.

6.4.12 Control force, maximum longitudinal. This force is a longitudinal pull force applied to the grip of the control stick (wheel) that varies linearly with control position.

6.4.13 Control surface(s) authority. Control surface(s) authority is that combination of active feedback controls that involve a pilot force or programmed displacement input and rate of pilot force or displacement input to the control surface(s) that results in the appropriate aircraft response to perform its intended maneuver.

6.4.14 Control surface(s) authority maximum. That combination of pilot force or programmed displacement input and rate of pilot force or displacement input to the control surface(s) that results in maximum loads being generated on airframe components during the maneuver for which it is specified.

6.4.15 Control surface buzz. Control surface buzz is usually evidenced by a pure rotational oscillation of a control surface, or by a torsional windup oscillation when fixity conditions are such as to restrain the motion of the surface near one end. The amplitude of buzz usually increases with an increase in lift coefficient. Buzz can lead to damage or destruction of the surface either by fatigue or by inducing yield loads when the amplitude is sufficiently large.

6.4.16 Control surface response. The aircraft motion resulting from changes in control surface position that apply load and hinge moments to the surface as a result of pilot input to the control system.

6.4.17 Critical condition. The design loading condition for which margins of safety indicate the structure is most likely to fail.

6.4.18 Demonstration program coordinator. The COMNAVAIRTESTCEN is assigned the responsibility, as lead activity, for the coordination of all demonstrations and for developing, operating, and maintaining the NAVAIR Management Information System (MIS) for all aircraft demonstration programs and, in conjunction with other Test Authorities, for reporting current program status to NAVAIR.

6.4.19 Departure. The event in the post-stall flight regime that precipitates entry into out-of-control post-stall gyration, spin, or deep stall condition. The departure may be characterized by divergent, large-amplitude, uncommanded aircraft motions, such as nose-slice or pitch-up. Departure is synonymous with complete loss of control. Departure modifiers are as follows:

6.4.19.1 Susceptible to departure. Departure from controlled flight will generally occur with the application or brief misapplication of pitch, roll, and yaw controls that may be anticipated in operational use.

6.4.19.2 Extremely susceptible to departure. Departure from controlled flight will generally occur with the normal application of pitch control alone, or with small roll and yaw control inputs.

6.4.19.3 Resistant to departure. Departure from controlled flight will only occur with a large and reasonably sustained misapplication of pitch, roll, and yaw controls.

6.4.19.4 Extremely resistant to departure. Departure from controlled flight can only occur after an abrupt and inordinately sustained application of gross, abnormal, pro-departure controls.

6.4.20 Dive. The term "dive" refers to a flight maneuver executed for the purpose of demonstrating strength and rigidity and store separation and release tactics.

6.4.21 Divergence. Divergence is a static aeroelastic instability of a lifting surface that occurs when the structural torsional restoring moment of the surface is exceeded by the aerodynamic torsional moment.

6.4.22 Equivalent Air Speed (EAS). The true airspeed multiplied by the root of the air density ratio at the altitude concerned.

6.4.23 Flutter. Flutter is a dynamic aeroelastic instability and self-excited oscillation of an aerodynamic surface. At speeds below the flutter speed, oscillations will be damped. At the flutter speed, oscillations will persist with constant amplitude, and at speeds above the flutter speed, oscillations will, in most cases, diverge and result in damage or destruction of the structure.

6.4.24 Formal. Formal refers to all demonstration tests the results of which indicate that a design requirement has been met, or that the design is suitable for fleet use, or that an item of equipment operates satisfactorily as part of the aircraft.

6.4.25 Gross weight, basic flight design. For Navy types VT, VP, VS, VAW, V/STOL, and VR, this weight shall be the takeoff gross weight with basic mission useful load. For VA and VF, the basic flight design gross weight shall be the weight of the aircraft with basic mission useful load minus the weight of 40 percent takeoff fuel.

6.4.26 Gross weight, maximum design. The maximum design gross weight shall be the weight of the aircraft with maximum internal and maximum external load for which provision is required, with no reductions permitted for fuel using during taxi, warmup, or climb-out.

6.4.27 Gross weight, minimum flying. The minimum flying gross weight for all types of aircraft shall be composed of the weight empty plus the items listed below:

a. Five percent of internal fuel (for flying qualities and for flutter and divergence considerations, zero fuel shall also be assumed).

b. Oil consistent with 5 percent internal fuel.

c. Minimum crew.

d. No disposable armament or ammunition.

e. No other useful load item.

6.4.28 Highest service ceiling. Highest service ceiling is the ceiling attainable with the use of afterburner or similar power augmentation.

6.4.29 Indicated Air Speed (IAS). The reading of the airspeed indicator uncorrected for instrument, installation and compressibility errors.

6.4.30 Inert missiles. Inert missiles are missiles without explosive material of any kind such as may be contained in rocket motors, fuzes, batteries, warheads and target detecting devices.

6.4.31 Inertial Yawing Moment Parameter (IYMP). The terms of IYMP, $I_x - I_y mb^2$ are defined as follows:

I_x and I_y are aircraft moments of inertia about the x and y axis respectively (slug-ft^2); m is aircraft mass (slugs); b is wing span (feet).

6.4.32 Landing, approach, and takeoff limit speed (V_{LF}). The landing, approach and takeoff limit speed is the maximum speed at which the landing gear and other devices will be open or extended for takeoff or landing.

6.4.33 Level flight maximum speed (V_{MAT}). The maximum speed attainable at the basic flight design gross weight in the basic configuration in level flight with maximum available thrust, including use of afterburners, and rocket thrust augmentation considering engine limitations, whichever is applicable.

6.4.34 Limit. The term "limit" used in such phrases as "limit load factor," "limit side load factor," and "limit dive speed" refers to the design limit as specified in the detail specification.

6.4.35 Load factor n. The ratio of a given load to the weight with which the load is associated. If employed, a subscript designates the direction of the load.

6.4.36 Loss-of-control warning. That natural aircraft behavior or artificial signal(s) that indicate to the pilot the approach of loss of control. Stall warning and the onset and development of loss-of-control warning shall be described as a function of AOA or airspeed for a given aircraft state. Natural stall warning and loss-of-control warning encompass successive AOA ranges.

6.4.37 Maximum safe. The expression "maximum safe load factor (or speed)" means the maximum load factor (or speed) at the specified speed (or load factor) which can be obtained without exceeding the specified limit strength or limits for satisfactory stability and control, or without experiencing dangerous buffet effects.

6.4.38 Maximum service speed (V_{max}). The maximum service speed, V_{max} or M_{max}, for each altitude is the lowest of:

a. The maximum permissible speed.

b. A speed which is a safe margin below the speed at which intolerable buffet or structural vibration is encountered.

c. The maximum airspeed at MAT, for each altitude, for dives (at all angles) from V_{MAT} at all altitude, from which recovery can be made at 2000 feet above MSL or higher without penetrating a safe margin from loss of control, other dangerous behavior, intolerable buffet, and without exceeding structural limits.

6.4.39 Minimum approach speed (V_{PAmin}). The minimum usable airspeed for carrier landings and field carrier landing practice. This speed shall be determined by methods approved by NAVAIR. It shall be as demonstrated by appropriate flight tests.

6.4.40 Minimum control airspeed (V_{mca}). The lowest airspeed at which control of the aircraft is possible with the critical engine inoperative.

6.4.41 Minimum control ground speed (V_{mcg}). The lowest speed at which directional control can be maintained on the ground when the critical engine fails during the take-off roll.

6.4.42 Nose slice. Uncommanded lateral-directional motion viewed by the pilot primarily as a divergence in yaw.

6.4.43 Pitch-up. Uncommanded, sudden increase in AOA.

6.4.44 Post-stall. The flight regime involving AOA greater than nominal stall AOA. The aircraft characteristics in the post-stall regime may consist of several more or less distinct types of aircraft motion: departure, post-stall gyration, spin, and deep stall.

6.4.45 Post-Stall Gyration (PSG). Uncontrolled motion about one or more aircraft axes following departure. While this type of aircraft motion involves AOA higher than the stall angle, lower angles may be encountered intermittently in the course of the motion. When the aircraft motion is other than random about all axes, a further classification of the PSG may be used for descriptive purposes. Such terms as snap roll, rolling departure, or tumble may be appropriate; however, they should all imply a PSG. The PSG is differentiated from a spin by the lack of a predominant, sustained yawing motion and by the potential for exhibiting sub-stall AOA.

6.4.46 Power. The parameter on which engine performance output is based is as follows:

Engine	Power Parameter
Turbojet-fan	Net thrust
Turboprop-shaft	Shaft horsepower plus thrust or equivalent shaft horsepower
Pulse jet	Net thrust
Ram jet	Net thrust
Rocket	Thrust
Combination of power plants	Use parameters of each applicable engine involved

6.4.47 Recovery. The transition from out-of-control conditions to controlled flight. This is normally considered to be that period between pilot initiation of recovery controls and that point when the AOA is at a value below stall and no significant, uncommanded angular motions remain.

6.4.48 Recovery rolls. Uncommanded rolling motions near or below stall AOA that may occur during the recovery phase of the spin or PSG.

6.4.49 Recovery, total altitude. The sum of the altitude losses during the recovery and dive pullout.

6.4.50 Spin. A sustained yaw rotation of AOAs above stall. The rotary motions of the spin may have oscillations in pitch, roll, and yaw superimposed upon them. The incipient spin is the initial, transitory phase of the motion during which it is not possible to identify the spin mode. The developed spin is the phase of the spin during which it is possible to identify the spin mode. The fully developed spin is attained when the trajectory has become vertical and no significant change is noted in the spin characteristics from turn to turn. Spin modes may be identified by average values of AOA and body axis yaw rate and by the magnitude of the three-axis angular oscillations. One modifier from each group listed in Table 4 may be used to characterize the mode.

6.4.51 Stall AOA. The AOA for maximum usable lift at a given flight condition (as defined in MIL-F-8785).

6.4.52 Stall, deep. An out-of-control flight condition in which the aircraft is sustained at an angle of attack well beyond that for Alpha (stall) while experiencing negligible rotational velocities. The deep stall may be distinguished from a PSG by the lack of significant motions other than a high rate of descent.

6.4.53 Stalling speed (V_S). The minimum speed for level flight at sea level in the basic configuration with zero thrust.

6.4.54 Stalling speed (V_{SL}). The minimum speed for level flight in the landing approach configuration with zero thrust.

6.4.55 Stalling speed with power (V_{SP}). The minimum speed for level flight at sea level in the landing configuration with the power or thrust required to provide satisfactory wave-off characteristics.

6.4.56 Stall warning. That natural aircraft behavior or artificial signal(s) that indicates to the pilot the approach of maximum usable lift. Normally, the onset and development of stall warning shall be described as a function of AOA or airspeed for a given aircraft state.

6.4.57 Stores. The term "stores" means all missiles, rockets, bombs, mines, torpedoes, detachable fuel and spray tanks, pods (refueling thrust augmentation, gun, ECM, etc.) targets, and similar items intended for carriage internally or externally by aircraft, including the racks, launchers, adapters, and pylons used for such carriage. This applies whether the items are, or are not, to be separated from the aircraft in flight.

6.4.58 Test Authority. One of the following designated by NAVAIR or COMNAVAIRTESTCEN, as applicable, to witness tests and demonstrations:

a. COMNAVAIRTESTCEN

b. NAVPRO

c. Commander, Commanding Officer or Officer-in-Charge of other supporting activities.

6.4.59 True Air Speed (TAS). The speed at which the aircraft moves through the surrounding air.

6.4.60 Wing rock. Uncommanded lateral-directional motion, viewed by the pilot primarily as roll oscillation.

6.5 Symbols, abbreviations and acronyms. The following symbols, abbreviations and acronyms are defined for use or referenced herein.

AB	Afterburner.
ACLS	Automatic Carrier Landing System.
AFCS	Automatic Flight Control System.
ALSS	Aviation Life Support Systems.
AMC	Alternate Mission(s) Configuration(s).
AOA	Angle of Attack.
APCS	Approach Power Compensator System.
APU	Auxiliary Power Unit.
ASW	Antisubmarine warfare.
ATE	Automatic Test Equipment.
b	Wing span, feet.
BO	Bolter.
C 1/2	Number of cycles for the lateral oscillations to damp to half amplitude. The inverse of damping parameter.
CAO	Contract Administration Officer.
cc	Clean configuration.
CDRL	Contract Data Requirements List.
CT	Catapult takeoff.
C_{NA}	Airplane normal force coefficient.
c.g., cg	Center of gravity.
CPS	Cycles per second.

CR	Cruise configuration.
CRT	Combat rated thrust.
D	Dive configuration.
dB	Sound intensity.
DID	Data Item Description.
DPGS	Data Processing Ground Station.
E^3	Electromagnetic environmental effects.
EAS	Equivalent airspeed.
EMC	Electromagnetic compatibility.
EMCON	Emission Control.
EMI	Electromagnetic interference.
FOT&E	Follow-on Test and Evaluation.
FQ&P	Flying Qualities and Performance.
FPM	Feet per minute.
FSED	Full scale engineering development.
G	Glide configuration.
GFP	Government furnished property.
HERF	Hazards of electromagnetic radiation to fuel.
HERO	Hazards of electromagnetic radiation to ordnance.
HERP	Hazards of electromagnetic radiation to personnel.
HPM	High power microwave.
IAS	Indicated airspeed.
IECMS	Inflight engine condition monitoring system.
ILS	Instrument landing system.
IMN	Indicated Mach number.
INSURV	Board of Inspection and Survey.
IR	Infrared.

IRT	Intermediate rated thrust (maximum non-augmented thrust).
IST	Initial sea trials.
JBD	Jet blast deflector.
L	Landing configuration.
LDGW	Landing design gross weight.
M	Mach number.
MI	Moment of inertia.
M_T	True Mach number.
MAT	Maximum augmented thrust.
M_{MAT}	Maximum level flight Mach number with maximum augmented thrust.
M_{MRT}	Maximum level flight Mach number with military rated thrust.
M_{omax}	Maximum operational Mach number, as defined by the maximum operational speed envelope.
MRP	Military rated power.
MSL	Mean sea level.
NEMP	Nuclear electromagnetic pulse.
NRP	Normal rated power.
n_{min}	Minimum symmetrical flight limit load factor (i.e., the lower boundary of the design V-n diagram).
n_{max}	Maximum symmetrical flight limit load factor (i.e., the upper boundary of the design V-n diagram).
n_y	Side load factor.
n_z	Normal load factor.
NOA	Normal operational asymmetry.
OBOGS	On-board oxygen generating system.
OPEVAL	Operational evaluation.
OPTEVFOR	Operational test and evaluation force.

OSC	Other stores configuration.
P	Power configuration.
PA	Power approach configuration.
PHAA	Positive high angle of attack.
PLAA	Positive low angle of attack.
PMC	Primary mission configuration.
$\frac{pb}{2V}$	The helix angle described by a wing tip during a rolling maneuver, where: p = rate of roll about the body axis. b = wing span, feet. V = true airspeed, feet per second.
PSG	Post stall gyration.
R&M	Reliability and maintainability.
RPM	Revolutions per minute.
SAS	Stability augmentation system.
S/B	Speedbrake(s).
SE	Support equipment.
SFTI	Special flight test instrumentation.
SFTIP	Special flight test instrumentation pool.
SOFT	Safety-of-flight test.
STOL	Short takeoff and landing.
TAS	True airspeed.
T&E	Test and evaluation.
TEMP	Test and evaluation master plan.
TIT	Turbine inlet temperature.
TLF	Thrust for level flight.
TNA	Thrust for normal approach.
TO	Takeoff configuration.

TPT	Tailpipe temperature.
V_E	Engaging speed for arrested landings.
V_{EAS}	Equivalent airspeed.
V_H	Maximum level flight speed.
V_L	Limit speed parameter in basic configuration specified for structural design.
V_{LF}	Landing, approach and takeoff limit speed.
V_{MAT}	Maximum level flight speed with maximum augmented thrust.
V_{max}	Maximum service speed.
V_{omax}	Maximum operational speed, as defined by the maximum operational speed envelope.
V_{mca}	Minimum control airspeed.
V_{mcg}	Minimum control speed, ground.
V_{min}	Minimum service speed.
V_{MRT}	Maximum level flight speed with military related thrust.
V_S	Stalling speed.
V_{SG}	Stalling speed in glide configuration.
V_{SL}	Stalling speed in landing configuration.
V_{SPA}	Stalling speed in power approach configuration.
V_{STO}	Stalling speed in takeoff configuration.
V_{vc}	Design sink speed.
$\bar{V}_{Vc}$	Average sink speed.
VTOL	Vertical takeoff and landing.
WO	Waveoff.

6.6 Subject term (key word) listing.

Detailed program plan
Full scale engineering development
High angle of attack

6.7 Streamlining. For MIL-D-8708 acquisitions, the required portions of all MIL-D-8708 tier reference shall be limited to the portions described in the "Applicability" column in Table X in appendix C.

6.8 Tailoring. When MIL-D-8708 is tailored in an acquisition, appendix C must be tailored accordingly. In particular, when appendix C is tailored, specific attention must be given to the chain of referencing. For example, if a first tier reference document in MIL-D-8708 is tailored out, all of the reference documents which are tiered to that first tier reference document must be tailored out.

6.9 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

APPENDIX A

CONTRACTOR DEMONSTRATION REQUIREMENTS FOR NAVY DEVELOPMENT TESTS

10. SCOPE

10.1 Scope. This appendix defines the general scope and purpose of Navy Development Tests and the contractor demonstrations that shall be completed prior to conducting each phase. This appendix is a mandatory part of this specification. The information contained herein is intended for compliance.

20. APPLICABLE DOCUMENTS

This section is not applicable to this appendix.

30. NAVY DEVELOPMENT TESTS

30.1 Development tests. At appropriate periods during Full Scale Engineering Development (FSED), a team of Navy pilots, engineers, technicians and maintenance personnel, will initiate Navy development tests, which consist of dedicated ground and flight tests by the test team to evaluate the aircraft design at various stages of development. The initial DT-IIA evaluation will be performed subsequent to the inspection of the aircraft and at the earliest practical point in the demonstration program. Additional evaluations such as DT-IIB, DT-IIC, etc., will be performed, as required, at times related to the demonstration program when the allowable envelope is increased, when new systems/equipment are incorporated, or when changes are incorporated to correct deficiencies. The final phase of DT-II is the formal technical evaluation (TECHEVAL) to assure readiness for OPEVAL.

30.2 Objectives. The objectives of Navy Development Tests are to:

a. Identify and allow early correction of deficiencies.

b. Evaluate changes incorporated.

c. Perform an early assessment of the aircraft in the shipboard environment.

d. Demonstrate that the aircraft meets the specification and contract guarantees.

e. Establish a basis for certification of readiness for OPEVAL.

30.3 Scope of tests.

30.3.1 DT-IIA. Within the allowable flight envelope, the evaluation will consist of:

a. Installation and functional ground and flight tests of all installed and operating equipment in the demonstration aircraft to the extent appropriate to the stage of development of the aircraft.

b. Evaluation of longitudinal, lateral, and directional stability and control flying qualities at a normal weight and corresponding c.g. as follows:

1. Taxi and ground handling characteristics.

2. Takeoff characteristics, including cross-wind evaluation.

3. Climb, cruise, maneuvering, and descent characteristics, including effects of speed brake, power, and configuration changes.

4. Transonic and supersonic characteristics including trim and stability changes when decelerating through sonic speed at a high load factor.

5. Buffet and vibration in flight.

6. Control characteristics with alternative and/or emergency systems in operation.

7. Low-speed characteristics, including stalls, waveoff and normal and moderate crosswind landings.

8. Carrier-approach characteristics, for carrier types.

9. Other items that may be specifically requested by the acquiring activity.

c. Performance evaluation of items in this specification for the particular model aircraft which include:

1. Takeoff and landing distances and speeds for normal service operation.

2. Maximum rate of climb and combat ceiling.

3. V_{max} at high and low altitude.

4. Acceleration and deceleration.

5. Stall speeds in various configurations.

6. Field carrier landing practice approach speeds (where applicable).

7. Mission profile and preliminary cruise control.

30.3.2 DT-IIB and subsequent evaluations. These evaluations will consist of:

a. Re-evaluation of those characteristics that are affected by aircraft changes installed since completion of prior evaluation(s).

b. Evaluation of those items planned to be performed in prior evaluation(s) that were not completed.

c. Evaluation of the items of DT-IIA at critical combinations of aircraft weight and c.g.

d. Evaluation of the aircraft for the expanded envelope and further investigation of characteristics not fully evaluated previously.

e. An Initial Sea Trials (IST) may be conducted prior to TECHEVAL by NAVAIRTESTCEN pilots to obtain an early assessment of the aircraft in the shipboard environment. Only normal landings and take-offs will be performed. The IST may be combined with the ACLS Sea Trials if practical. A shore based build-up phase will be conducted prior to the Sea Trials to ensure that the aircraft is suitable for limited carrier operations.

f. ACLS Sea Trials (ACLS/ST) may be conducted prior to TECHEVAL by NAVAIRTESTCEN pilots to obtain an early assessment of the ACLS performance in the shipboard environment. A shore based build-up phase will be conducted prior to the Sea Trials to ensure that the ACLS is suitable for limited carrier operations.

30.3.3 TECHEVAL. TECHEVAL is the final phase of DT-II and is conducted with production representative hardware and validated software to identify technical deficiencies and determine whether the design meets technical specifications and contract guarantees for certification of readiness for OPEVAL. TECHEVAL is conducted at critical combinations of aircraft weight and c.g. and includes:

a. Re-evaluation of those characteristics that are affected by aircraft changes installed since completion of prior DT-II evaluations.

b. Evaluation of aircraft to the limits of the specified flight envelope (repeating only those items affected by any expansion of the flight envelope).

c. An evaluation of the aircraft weapon system installation, which includes but is not necessarily limited to the following:

   1. Functional and accuracy checks of gun, bomb, rocket, guided missile, fire control, and other armament installations, systems, and equipment; photographic, electrical, and avionic equipments.

2. Flight tests of tracking characteristics and gunnery runs.

3. Flight tests of fire control systems and firing runs at a suitable target.

4. Flight tests of guided missile control systems, including launch and guidance to intercept or impact on a suitable target.

5. Suitability of control of external stores and store drops. The quantity, types of stores, and load configuration will be as specified in the detail specification.

40. CONTRACTOR DEMONSTRATION REQUIREMENTS.

40.1 Contractor demonstration. The contractor shall configure the test aircraft for each DT-II evaluation as approved for the demonstration program or as agreed upon during the applicable Pre-DT-II conference. Installed instrumentation shall not be changed from that used by the contractor unless specifically requested by the cognizant Test Authority. It shall have been shown by flight tests prior to the DT-II evaluations and by other data, if required, that within the allowable flight envelope, the aircraft is aerodynamically,and aeroelastically stable, and structurally and functionally safe for the tests to be performed by Navy pilots.

40.2 Pre-DT-II engineering data. Data substantiating the proposed envelopes and recommended initial evaluation operating limits shall have been submitted at least two weeks prior to the applicable pre-DT-II evaluation conference. Prior to initiation of DT-II evaluations, the acquiring activity will have authorized release of the aircraft and established the initial operating limits for Navy test pilots.

40.3 Inspection. A complete inspection of the aircraft and its components shall be accomplished prior to initiation of DT-IIA. The scope of this inspection shall be as approved during the Pre-DT-IIA conference. The contractor shall perform the inspection, and it will be witnessed by representatives of the Test Authority.

40.4 Proposed flight envelopes. The flight envelopes proposed for the DT-IIA, DT-IIB, and subsequent evaluations shall be defined in the first and subsequent Demonstration Planning and Progress Reports. Prior to evaluation flights by Navy pilots, sufficient flight tests shall have been performed to establish the permissible flight envelope. The flight envelopes shall be sufficient to permit an adequate evaluation of the items of 30.3.1 and 30.3.2 for DT-IIA, DT-IIB, and subsequent evaluations.

40.5 Requirements prior to TECHEVAL. Prior to TECHEVAL, the following demonstrations shall have been completed:

a. Structural build-up tests specified in Tables IA and IB shall have been completed within the required service flight envelope. Data from tests may be used to satisfy the formal structural demonstration tests in Table IC or ID, as applicable.

b. Land-based and carrier-based takeoff, landing and taxi tests. For carrier-based aircraft, the tests include only field landing and takeoffs.

c. Structural dynamic flight tests.

d. Aerodynamics demonstrations as follows:

   1. Flying qualities tests within the service flight envelope.

   2. Maximum permissible speed envelope.

   3. Spin build-up tests.

e. Propulsion system tests.

f. All armament system software shall have been validated and the following tests completed:

   1. Ground and flight functional tests of all installed equipment.

   2. Firing of guns and rockets.

   3. Guided missile demonstration.

   4. Droppable stores tests.

   5. Armament control tests.

g. All avionic system hardware and software shall have been tested.

h. Crew system demonstration.

40.6 Requirements prior to IST or ACLS/ST. When IST or ACLS/ST are conducted prior to TECHEVAL the following additional demonstrations shall have been completed:

a. Prior to commencement of the build-up phase for IST, the contractor shall have:

   1. Satisfactorily completed the steam ingestion demonstration (exhaust gas ingestion for VSTOL aircraft).

   2. Satisfactorily completed the jet blast deflector demonstration.

3. Made sufficient progress in the conduct of the carrier suitability catapult launch and arrested landing structural demonstration (landing structural demonstrations for VSTOL aircraft) to ensure adequate strength during shipboard operation of the loading(s) and configurations to be tested.

4. Completed the EMV/EMI survey.

5. Corrected those deficiencies identified during earlier DT-II phases which require correction prior to IST.

b. Prior to the commencement of the ACLS/ST the contractor shall have:

1. Conducted the ACLS Simulation evaluation.

2. Conducted the ACLS ground demonstration.

3. Conducted the ACLS airborne subsystem flight functional check demonstration of the ACLS radar augmenter, ILS receiver, data link installation (including the associated antennas), and the ACLS and ILS displays (discrete and flight path error data).

4. Conducted the ACLS open loop flight demonstration.

5. Conducted the ACLS closed loop flight demonstration.

6. Corrected those deficiencies identified during earlier DT-II phases that require correction prior to ACLS/ST.

50. CONFERENCES

50.1 Pre-DT-II conferences. Prior to the initiation of development test phases DT-IIA (and subsequent) and TECHEVAL, conferences shall be held to review the results of all ground and flight tests accomplished prior to that phase. The extent to which the test requirements have been satisfied within the authorized envelope shall be reviewed and the configuration of the aircraft to be available for the specific DT-II phase and the extent to which support will be required will be defined.

50.2 Post DT-II conferences. Following the availability and review of reports of the DT-II development tests, conferences shall be held to review corrective action taken or recommended to be taken on each deficiency reported during these phases and to discuss an effectivity date or production number for corrective action.

APPENDIX B

SCHEDULE OF DATES FOR SUBMISSION OF REPORTS AND FOR CONFERENCES

10. SCOPE

10.1 Scope. The purpose of this appendix is to provide an easy reference to the dates for submission of reports and for the convening of conferences. This appendix is not a mandatory part of the specification. The information contained herein is intended for guidance only.

20. APPLICABLE DOCUMENTS

This section is not applicable to this appendix.

30. TABLES OF REPORTS SUBMISSION/CONFERENCE CONVENING DATES

TABLE VI. Reports schedule and data item description.

Report name	Reference paragraph	DID number and title	Days before first flight	Days before demo	Days after demo	Days prior to TECHEVAL
Demonstration Program Plan	3.11.3.1	DI-NDTI-80808 (Test Plans/ Procedures)	120			
Structural Instrumentation Report	3.11.3.3.2	DI-T-30728 (Instrumentation & Calibration Report)		30		
Structural Demonstration Test Plan	3.11.3.8	DI-NDTI-80566 (Test Plan)		90		
Structural Pre-Flight Load Survey Report	3.11.3.9	DI-S-30591 (Data and/or Analysis Summary)		60		
Structural Flight Loads Survey Report	3.11.3.10	DI-S-30591 (Data and/or Analysis Summary)		45		
Structural Flight Limitations Report	3.11.3.11	DI-S-30591 (Data and/or Analysis Summary)		45		
Pre-Structural Demonstration Report	3.11.3.12	DI-S-30591 (Data and/or Analysis Summary)		45		

TABLE VI. Reports schedule and data item description -Continued.

Report name	Reference paragraph	DID number and title	Days before first flight	Days before demo	Days after demo	Days prior to TECHEVAL
Structural Demonstrations Report	3.11.3.13	DI-T-2072 (Reports, Test)			30	
Aeroacoustic Environment Ground Test Report	3.11.3.14e	DI-T-2072 (Reports, Test)			60	
Vibration Environment Measurement Report	3.11.3.14f	DI-T-2072 (Reports, Test)			60	
Aeroacoustic Environment Measurement Report	3.11.3.14g	DI-T-2072 (Reports, Test)			60	
Aerodynamic Demonstration Test Plan	3.11.3.17	DI-NDTI-80566 (Test Plan)		90		
Flying Qualities Demonstration Report	3.11.3.18	DI-T-2072 (Reports, Test)				15
Performance Data Reduction Report	3.11.3.20	DI-MISC-80711 (Scientific and Technical Reports)		90		
Guaranteed Performance Report	3.11.3.21	DI-T-2072 (Reports, Test)		30		

TABLE VI. Reports schedule and data item description - Continued.

Report name	Reference paragraph	DID number and title	Days before first flight	Days before demo	Days after demo	Days prior to TECHEVAL
Performance Demonstration Report	3.11.3.22	DI-T-2072 (Reports, Test)			60	
Propulsion System Demonstration Test Plan	3.11.3.23	DI-NDTI-80566 (Test Plan)		60		
Engine Installation Vibration Test Plan	3.11.3.24	DI-NDTI-80566 (Test Plan)		60		
Engine Virbration Survey Report	3.11.3.25	DI-T-2072 (Reports, Test			60	
Engine Temperature Survey Report	3.11.3.26	DI-T-2072 (Reports, Test)			60	
Compressor Inlet and Turbine Outlet Pressure Survey Report	3.11.3.27	DI-T-2072 (Reports, Test)			60	
Propulsion System Demonstration Report	3.11.3.28	DI-T-2072 (Reports, Test)			60	
Propeller Vibration Survey Report	3.11.3.29	DI-T-2072 (Reports, Test)			60	

TABLE VI. Reports schedule and data item description - Continued.

Report name	Reference paragraph	DID number and title	Days before first flight	Days before demo	Days after demo	Days prior to TECHEVAL
Armanment System Demonstration Test Plan	3.11.3.30	DI-NDTI-80566 (Test Plan)		90		
Gunfire Vibration and Aeroacoustic Environment Measurement Report	3.11.3.31	DI-T-2072 (Reports, Test)			60	
Missile Vibration and Aeroacoustic Environment Measurement Report	3.11.3.32	DI-T-2072 (Reports, Test)			60	
Aircraft Weapon System Accuracy Report	3.11.3.33	DI-T-2072 (Reports, Test)				60
Armanment Demonstration Report	3.11.3.34	DI-T-2072 (Reports, Test)			60	
Carrier Suitability Demonstration Test Plan and Schedule	3.11.3.35	DI-NDTI-80566 (Test Plan)		90		
Jet Blast Deflector Acoustic and Thermal Environment Report	3.11.3.36	DI-T-2072 (Reports, Test)			60	
AFCS/APCS/ACLS Demonstration Report	3.11.3.37	DI-T-2072 (Reports, Test)			60	
Carrier Suitability Demonstration Report	3.11.3.38	DI-T-2072 (Reports, Test)			60	

TABLE VI. Reports schedule and data item description - Continued.

Report name	Reference paragraph	DID number and title	Days before first flight	Days before demo	Days after demo	Days prior to TECHEVAL
Avionic System Demonstration Test Plans	3.11.3.39	DI-NDTI-80566 (Test Plan)		60		
Avionic System Demonstration Reports	3.11.3.40	DI-T-2072 (Reports, Test)			60	
Electromagnetic Compatibility (EMC) Demonstration Test Plan	3.11.3.41	DI-EMCS-80201 (Electromagnetic Interference Test Plan)		60		
Electromagnetic Compatibility (EMC) Demonstration Report	3.11.3.42	DI-T-2072 (Reports, Test)			60	
Electrical System Demonstration Test Plan	3.11.3.43	DI-NDTI-80566 (Test Plan)		60		
Electrical System Demonstration Report	3.11.3.44	DI-T-2072 (Reports, Test)				60
Instrument Systems Demonstration Plan	3.11.3.45	DI-NDTI-80566 (Test Plan)		60		
Instrument Systems Demonstration Report	3.11.3.46	DI-T-2072 (Reports, Test)			60	
Crew Systems and Human Engineering Demonstration Test Plan	3.11.3.47	DI-HFAC-80743 (Human Engineering Test Plan)		60		

TABLE VI. Reports schedule and data item description - Continued.

Report name	Reference paragraph	DID number and title	Days before first flight	Days before demo	Days after demo	Days prior to IECHEVAL
Crew Systems and Human Demonstration Report	3.11.3.48	DI-T-2072 (Reports, Test)			60	
Miscellaneous Installed Systems Demonstration Test Plan	3.11.3.49	DI-NDTI-80566 (Test Plan)		60		
Miscellaneous Installed Systems Report	3.11.3.50	DI-T-2072 (Reports, Test)			60	
Icing Survey Test Plan	3.11.3.51	DI-NDTI-80566 (Test Plan)		60		
Icing Survey Report	3.11.3.52	DI-T-2072 (Reports, Test)			60	
Reliability and Maintainability Demonstration Test Plan	3.11.3.53	DI-NDTI-80566 (Test Plan) DI-MNTY-80831 (Maintainability/Testability Demon. Test Plan)		60		
Reliability and Maintainability Demonstration Report	3.11.3.54	DI-T-2072 (Reports, Test) DI-MNTY-80832 (Maintainability/Testability Demon. Test Report			60	

TABLE VI. Reports schedule and data item description - Continued.

Report name	Reference paragraph	DID number and title	Days before first flight	Days before demo	Days after demo	Days prior to TECHEVAL
Support Demonstration Test Plan	3.11.3.55	DI-NDTI-80566 (Test Plan)		60		
Support Demonstration Report	3.11.3.56	DI-T-2072 (Reports, Test)			60	
Accessory Equipment Demonstration Test Plan	3.11.3.57	DI-NDTI-80566 (Test Plan)		30		
Accessory Equipment Demonstration Report	3.11.3.58	DI-T-2072 (Reports, Test)			60	
System Safety Demonstration Test Plan	3.11.3.59	DI-NDTI-80566 (Test Plan)		60		
System Safety Demonstraton Report	3.11.3.60	DI-T-2072 (Reports, Test)			60	
Safety Assessment Report	3.11.3.61	DI-SAFT-80102 (Safety Assessment Report)	30			
Combat Survivability Demonstration Test Plan	3.11.3.62	DI-NUOR-80928 (Nuclear Survivability Test Plan)		90		
Combat Survivability Demonstration Test Report	3.11.3.63	DI-T-2072 (Reports, Test)			60	
Special Flight Test Instrumentation Inventory and Status Report	3.11.3.3.3	DI-MGMT-80441 (Govt Property Physical Inventory Count or Custodial Balance Report)		Annually as of 30 May		

TABLE VII. Reports with no fixed submission date.

Report name	Reference paragraph	DID number and title	When submitted
Demonstration Planning and Progress	3.11.3.2	DI-MISC-80711 (Scientific & Technical Reports)	At intervals not exceeding two months
Demonstration Instrumentation Report	3.11.3.3.1	DI-T-30728 (Instrumentation and Calibration Report)	After the Instrumentation Planning Conference but not later than three months prior to the last date for installation of the instrumentation
Special Flight Test Instrumentation (SFTI) Excess Equipment Report	3.11.3.3.4	DI-MISC-80348 (Report of Excess Equipment)	When SFTI becomes excess
Special Flight Test Instrumentation (SFTI) Requisition and Technical Report	3.11.3.3.5	DI-MGMT-80441 (Government Property Physical Inventory Count or Custodial Balance Report)	When SFTI is initially acquired
Daily Flight Reports	3.11.3.4	DI-MISC-80711 (Scientific & Technical Reports)	Daily for at least the first 20 flights of each of the first two demonstration aircraft
Bi-Weekly Summary Reports	3.11.3.5	DI-MISC-80711 (Scientific & Technical Reports)	Every two weeks

TABLE VII. Reports with no fixed submission date - Continued.

Report name	Reference paragraph	DID number and title	When submitted
Demonstration Report	3.11.3.6	DI-MISC-80711 (Scientific & Technical Reports)	At intervals not greater than two months beginning with the first revision of the Demonstration Planning and Progress Report following first flight
Aeroelastic Stability, Vibration and Aeroacoutic Flight Test Planning Report	3.11.3.14a	DI-NDTI-80808 (Test Plans/ Procedures)	90 days before start of instrumentation of airplane
Aeroelastic Stability Flight Test Letter Report(s)	3.11.3.14b	DI-T-2072 (Reports, Test)	7 days after end of each bi-weekly flight test period
Vibration and Aeroacoustic Flight Test Letter Report(s)	3.11.3.14c	DI-T-2072 Reports, Test)	7 days after end of each bi-weekly flight test period
Aeroelastic Instability, Vibration, or Sonic Fatigue Occurence Report(s)	3.11.3.14d	DI-MISC-80711 (Scientific & Technical Reports)	NLT one day after occurence of any aeroelastic instability, sonic fatigue failures, or excessive vibration in ground/flight test
Structural Flight Test Anomaly and Failure Report	3.11.3.15	DI-MISC-80711 (Scientific & Technical Reports)	30 days after a structural anomaly or failure is experienced
Structural Ground Loads and Carrier Suitability Demonstration Report	3.11.3.16	DI-MISC-80711 (Scientific & Technical Reports)	30 days after the structural ground loads and carrier suitability demonstration conference

APPENDIX B

TABLE VIII. Conference schedule.

Conference name	Days before first flight	Days before test/demo
Instrumentation Planning Conferences	550	
Structural Flight Load Survey Planning Conference		60
Structural Flight Demonstration Planning Conference		30
Structural Ground loads and Carrier Suitability Demonstration Planning Conference		180
Structural Dynamic Flight Demonstration Planning Conference		30
Performance Data-Reduction Procedures Conference		180
High AOA and Spin Demonstration Planning Conference		30
Performance Demonstration Planning Conference		120
Flying Qualities Demonstration Conference		30
Avionics Demonstration Conference		180

APPENDIX B

TABLE IX. Conference with no fixed convening date.

Conference name	When convened
Structural Instrumentation Planning Conference	One month after submittal of the structural instrumentation report
Pre-DT-II Conferences	Prior to DT-IIA and subsequent evaluations as scheduled by the acquiring activity or the Test Authority
Post-DT-II Conferences	Following the availability and review of the results of the DT-IIA and subsequent evaluations when scheduled by the acquiring activity or the Test Authority

APPENDIX C

STREAMLINING INFORMATION

10. SCOPE

10.1 Scope. This appendix is a list of documents referenced in MIL-D-8708 or tiered to documents referenced in MIL-D-8708. These documents have the same status as those referenced directly in MIL-D-8708 (first tier documents). This appendix is a mandatory part of this specification. The information contained herein is intended for compliance.

10.2 Application. This appendix identifies the applicability of the documents referenced in MIL-D-8708 or tiered to documents referenced in MIL-D-8708 through the third tier. Only that portion(s) of a document, listed in Table X of this appendix and described in the "Applicability" column, is pertinent in the use of MIL-D-8708. If MIL-D-8708 is tailored in acquisition, this appendix must also be tailored.

20. APPLICABLE DOCUMENTS

20.1 Documents. The documents listed herein and corresponding applicability data have been identified as required. All other documents referenced through tiering are not considered required and may be used for guidance and information.

TABLE X. Required documents and corresponding applicability data.

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (1 of 96 Documents)			
MIL-E-5007	Engine, Aircraft, Turbojet and Turbofan, General Specification for	Demonstration of inlet air pressure variation; engine conditioning monitoring requirements.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-E-5007, are for guidance and information.			
First Tier (2 of 96 Documents)			
MIL-S-8512	Support Equipment Aeronautical, Special, General Specification for the Design of	Pneumatic systems, hydraulic and pneumatic system pressure test.	MIL-D-8708
Second Tier			
MIL-P-87210 Replaces MIL-P-5518	Pneumatic Power Systems, High Pressure	Pneumatic systems.	MIL-S-8512
The remaining second tier references, tiered to MIL-S-8512, are for guidance and information.			
Third Tier			
All third tier references, tiered to MIL-S-8512, are for guidance and information.			

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (3 of 96 Documents)			
MIL-B-5087	Bonding, Electrical and Lightning Protection, for Aerospace Systems	Requirements and quality assurance.	MIL-D-8708
Second Tier			
AN960	Washer, Flat	Entire document.	MIL-B-5087
AN935	Washer - Lock, Spring	Entire document (for use when temperature does not exceed 400°F).	MIL-B-5087
MS35338 (Replaces MS35337)	Washer, Lock-Spring, Helical, Regular (Medium) Series	Entire document (for use when temperature does exceed 400°F).	MIL-B-5087
MS35340 (Replaces MS35339)	Washer, Lock-Spring, Helical, Extra Duty	Entire document (for use when temperature does exceed 400°F).	MIL-B-5087
MS25083	Jumper Assembly, Electric Bonding and Current Return	Entire document (for use when temperature does not exceed 300°F).	MIL-B-5087
AN735	Clamp, Loop Type Bonding	Requirements for CRES and aluminum plumbing only; zinc plating prohibited	MIL-B-5087
TT-L-32 (Replaces MIL-L-6706)	Lacquer, Cellulose Nitrate, Glass for Aircraft	Clear lacquer.	MIL-B-5087

All remaining second tier references, tiered to MIL-B-5087, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
Third Tier			
MIL-S-7952	Steel, Sheet and Strip Uncoated Carbon (1020 and 1025) (Aircraft Quality)	Carbon steel.	AN960
MIL-S-5059	Steel, Corrosion-Resistant (18-8) Plate, Sheet and Strip	Requirements.	AN960
QQ-A-250/5	Aluminum Alloy ALCAD 2024, Plate and Sheet	T3 or T4.	AN960
QQ-B-613	Brass, Leaded and Non-Leaded, Flat Products (Plate, Bar, Sheet and Strip)	Composition 1 or 2.	AN960
QQ-P-416	Plating, Cadmium (Electrodeposited)	Type II, Class 2	AN960
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys	Requirements.	AN960
MIL-C-5541	Chemical Conversion Coatings on Aluminum and Aluminum Alloys	Class 3.	AN960 MS25083
MIL-C-13924	Coating, Oxide, Black, for Ferrous Metals	Class 3 or 4.	AN960
QQ-P-35	Passivation Treatments for Corrosion-Resisting Steel	Requirements for uncoated CRES only.	AN960 AN735 MS35338
QQ-B-746	Bronze, Phosphor; Bars, Plates, Rods, Shapes, Sheets and Strips	Composition A.	AN935

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
QQ-C-591	Copper Silicon, Copper Zinc Silicon and Copper Nickel Silicon Alloys, Rod, Wire, Shapes, Forgings and Flat Products	Class A, Composition hard.	AN935
QQ-P-416	Plating, Cadmium (Electrodeposited)	Type III, Class 3. Type II, Class 2.	AN935 MS35338
FED-STD-595	Colors	Color Number 23538.	AN935 MS35338
MIL-S-5059	Steel, Corrosion-Resistant (18-8), Plate, Sheet and Strip	302 CRES steel.	AN735
AMS 5510	Steel Sheet, Strip and Plate, Corrosion and Heat Resistant, 18Cr-10.5Ni-.4Ti Solution, Heat Treated	Technical requirements and quality assurance sections.	AN735
ASTM A380	Cleaning and Descaling Stainless Steel Parts, Equipment and Systems	Cleaning and descaling sections.	AN735
FED-STD-66	Steel, Chemical Composition and Hardenability	C1060 to C1080 steel.	MS35338
QQ-B-750	Bronze, Phosphor, Bar, Plate, Rod, Sheet Strip, Flat Wire and Structural and Special Shaped Sections	Composition A, condition hard.	MS35338
QQ-N-286	Nickel-Copper-Aluminum Alloy, Wrought	Class A.	MS35338
MIL-P-16232	Phosphate Coating, Heavy, Manganese or Zinc Base (for Ferrous Metals)	Type Z, Class 2.	MS35338

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-C-13924	Coating, Oxide, Black, for Ferrous Metals	Class 4.	MS35338
MIL-I-17214	Indicator, Permeability, Low-Mu (Go-No-Go)	Magnetic permeability of 2 maximum; field strength of M=200.	MS35338
QQ-A-225/2	Aluminum Alloy Bar, Rod and Wire, Rolled Drawn or Cold Finished, 3003	Temper O.	MS25083
WW-T-700/2	Tube, Aluminum Alloy, Drawn, Seamless, 1100	Temper O.	MS25083
QQ-A-250/2	Aluminum Alloy 3003, Plate and Sheet	Temper O.	MS25083
MIL-I-23053/5	Insulation Steering, Electrical, Heat Shrinkable, Polyolefin, Flexible Crosslinked	Class 2, clear, heat shrinkable.	MS25083
ASTM B172	Standard Specification for Rope-Lay-Stranded Copper Conductors Having Branched-Stranded Members	Classification and requirements for wire sections.	MS25083
MIL-T-7928	Terminal, Lug and Splice, Crimp-Style, Copper	Any QPL item.	MS25083

The remaining third tier references, tiered to MIL-B-5087, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (4 of 96 Documents)			
MIL-W-5088	Wiring, Aerospace Vehicle	Electrical and protection systems requirements.	MIL-D-8708
Second Tier			
MIL-STD-1388	Logistic Support Analysis	RAM goals for the wiring system.	MIL-W-5088
MIL-F-7179	Finishes, Coatings, and Sealants	Requirement section only for metals.	MIL-W-5088
MIL-STD-454	Standard General Requirements for Electronic Equipment	Requirement 16, Dissimilar Metals; Requirement 5, Soldering.	MIL-W-5088
MIL-S-8516	Sealing Compound, Polysulfide Rubber Electric Connectors and Electric Systems, Chemically Cured	Any QPL item.	MIL-W-5088
MIL-S-23586(1)	Sealing Compound, Electrical, Silicone Rubber, Accelerator Required	Any QPL item.	MIL-W-5088
MIL-W-22759	Wire, Electric, Fluropolymer, Insulated, Copper or Copper Alloy	Any QPL item.	MIL-W-5088
MS14100	Tape Identification, Coaxial Cable, Transmission Line Assembly	Wire identification.	MIL-W-5088
MIL-T-81490	Transmission Lines, Transverse Electromagnetic Mode	Any QPL item.	MIL-W-5088

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-STD-704	Aircraft Electric Power Characteristics	Voltage drop for power distribution circuits.	MIL-W-5088
MIL-C-85485	Cable, Electric, Filter Line, Radio Frequency Absorptive	Any QPL item.	MIL-W-5088
MS25274	Cap, Electrical (Wire End Crimp Style, Type II, Class 1) for 105°C Total Conductor Temperature	Caps for use on undesignated wire ends.	MIL-W-5088
MIL-E-6051	Electromagnetic Compatibility Requirements	Minimum EMI requirements.	MIL-W-5088
MIL-C-7762	Compasses, Installation of	Maximum allowable compass deviation.	MIL-W-5088
MIL-S-23190	Straps, Clamps, and Mounting Hardware, Plastic for Cable Harness Tying and Support	Any QPL item.	MIL-W-5088
MS21919	Clamps, Loop Type, Cushioned Support	Wire support.	MIL-W-5088
MS25281	Clamp, Loop, Plastic, Wire Support	Wire support.	MIL-W-5088
MIL-T-43435	Tape, Lacing and Tying	Requirements and quality assurance.	MIL-W-5088
MIL-I-23594	Insulation Tape, Electrical High Temperature, Polytetrafluroethylene, Pressure-Sensitive	Type I.	MIL-W-5088
MS90387	Tool, Hand, Adjustable for Plastic and Metal Tiedown Straps	Installation tool for plastic straps.	MIL-W-5088

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-I-7444	Insulation Sleeving, Electrical, Flexible	Requirements and quality assurance.	MIL-W-5088
MIL-I-631	Insulation, Electrical, Synthetic Resin Composition, Nonrigid	Any QPL item.	MIL-W-5088
MIL-I-3190	Insulation Sleeving, Electrical, Flexible, Coated, General Specification for	Any QPL item.	MIL-W-5088
MIL-I-3190 (Replaces MIL-I-18057)	Insulating Sleeving, Electrical, Flexible, Treated	Any QPL item.	MIL-W-5088
MIL-I-3190 (Replaces MIL-I-18057)	Insulation Sleeving, Electrical, Flexible, Coated, Class 200, Type D, Category C	Any QPL item.	MIL-W-5088
MIL-I-23053	Insulation Sleeving, Electrical, Heat Shrinkable, General Specification for	First article requirements and quality assurance.	MIL-W-5088
MS25171	Nipple, Electrical Terminal	Requirements.	MIL-W-5088
MS35489	Grommets, Synthetic and Silicone Rubber, Hot-Oil and Coolant Resistant	Requirements.	MIL-W-5088
MS21266	Grommet, Plastic Edging	Requirements for permanent bonded grommets.	MIL-W-5088

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-S-83519	Splice, Shield Termination, Solder Style, Insulated, Heat Shrinkable, Environment Resistant, General Specification for	Any QPL item.	MIL-W-5088
MIL-C-6136	Conduit: Electrical, Flexible, Shielded, Aluminum Alloy for Aircraft Installations	Requirements and quality assurance for use when rigid conduits are impractical.	MIL-W-5088
MIL-B-5087	Bonding, Electrical and Lightning Protection, for Aerospace Systems	Conduit grounding.	MIL-W-5088
MIL-C-39029	Contacts, Electric Connector, General Specification for	Any QPL item.	MIL-W-5088
MIL-C-22520	Crimping Tools, Terminal, Hand or Power Actuated, Wire Termination and Tool Kits, General Specification for	Any QPL item.	MIL-W-5088
MIL-C-3607	Connectors, Coaxial, Radio Frequency, Series Pulse, General Specification for	Requirements and quality assurance.	MIL-W-5088
MIL-C-3650	Connectors, Coaxial, Radio Frequency, Series LC	Requirements and quality assurance.	MIL-W-5088
MIL-C-3655	Connector, Plug and Receptacle, Electrical (Coaxial, Series Twin) and Associated Fittings, General Specification for	Any QPL item.	MIL-W-5088

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-C-26637	Connectors, Coaxial, Radio Frequency, Series LT, General Specification for	Requirements and quality assurance.	MIL-W-5088
MIL-C-25516	Connector, Electrical, Miniature, Coaxial, Environment Resistant Type, General Specification for	Any QPL item.	MIL-W-5088
MIL-C-39012	Connectors, Coaxial, Radio Frequency, General Specification for	Any QPL item.	MIL-W-5088
MS33540	Safety Wiring and Cotter Pinning, General Practices for	CRES wire.	MIL-W-5088
MIL-M-24041	Molding and Potting Compound, Chemically Cured Polyurethane (Polyether Based)	Any QPL item.	MIL-W-5088
MS27488	Plug, End Seal, Electrical Connector	Requirements.	MIL-W-5088
MIL-B-7883	Brazing of Steels, Copper, Copper Alloys, Nickel Alloys, Aluminum and Aluminum Alloys	Requirements and quality assurance.	MIL-W-5088
MS90376	Caps, Dust, Plastic, Electric Connector	Dust caps.	MIL-W-5088
NAS813	Cap - Protective, Electrical Connector	Dust caps.	MIL-W-5088
NAS820	Plug - Protective, Electrical Connector	Dust caps.	MIL-W-5088

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-C-85049	Connector Accessories, Electrical, General Specification for	Any QPL item.	MIL-W-5088
MIL-T-7928(2)	Terminal, Lug and Splice, Crimp Style, Copper	Any QPL item.	MIL-W-5088
MIL-S-81824	Splice, Electric, Permanent, Crimp Style, Copper Insulated, Environment Resistant	Any QPL item.	MIL-W-5088
MIL-T-7099	Terminal, Lug and Splice, Crimp Style Aluminum, for Aluminum Aircraft Wire	Any QPL item.	MIL-W-5088
MS25439	Splice - Permanent Crimp Style, 2 Way Type for Aluminum Aircraft Wire, Class 1	Aluminum conductor splices.	MIL-W-5088
MIL-T-81714/11	Terminal Junction System Splice, Single	Any QPL item.	MIL-W-5088
MIL-T-81714/12	Terminal Junction System Splice, Double	Any QPL item.	MIL-W-5088
MS18029	Cover Assembly, Electrical, for MS27212 Terminal Board Assembly	Requirements.	MIL-W-5088
MIL-T-81714	Terminal Junction Systems, General Specification for	Any QPL item.	MIL-W-5088

The remaining second tier references, tiered to MIL-W-5088, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
Third Tier			
MIL-F-18264	Finishes, Organic, Weapons Systems, Application and Control of	Application of organic finishes; Table II requirements; coating requirements for interior and exterior finishes.	MIL-F-7179
MIL-S-5002	Surface Treatments and Inorganic Coatings for Metal Surfaces of Weapon Systems	Metal surface treatments.	MIL-F-7179
MIL-STD-104	Limit for Electrical Insulation Color	Insulation color for Type III sleeving.	MIL-I-7444
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes	Level III, AQL of 2.5%.	MIL-I-7444
FED-STD-601	Rubber, Sampling and Testing	Method 4111, Tensile strength; Method 2021, Thickness; Method 4121, Elongation; Method 14011, Specific Gravity.	MIL-I-7444
ASTM D746	Brittleness Temperature of Plastics and Elastomers by Impact	Procedures for testing at 67°C.	MIL-I-7444
ASTM D786(3)	Cellulose Acetate Plastic Sheets	Dielectric with air as surrounding medium.	MIL-I-7444
QQ-C-576	Copper Flat Products With Slit, Slit and Edge Rolled, Sheared, Sawed or Machine Edges (Plate, Bar, Sheet and Strip)	Copper plate.	MIL-I-7444
QQ-A-250/4	Aluminum Alloy 2024, Plate and Sheet	Any QPL item.	MIL-I-7444

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
TT-S-735	Standard Test Fluids, Hydrocarbons	Type VI.	MIL-I-7444
FED-STD-595	Colors	Color numbers 37144 and 17038.	MS14100
MIL-T-9906	Tape, Identification, Aerospace Vehicle, Tubular Marking	Any QPL item.	MS14100
ASTM D4066 (Replaces MIL-M-20693)	Standard Specification for Nylon Injection and Extrusion Material	Composition A, Type 1.	MS25281 MS21266
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys	Requirements and quality assurance.	MS25281
MIL-S-23190	Straps, Clamps and Mounting Hardware, Plastic for Cable Harness Tying and Support	Any QPL item.	MS90387
ZZ-R-765 (Replaces MIL-R-5847)	Rubber, Silicone	Class 2, Grade 50.	MS25171
ASTM D1457 (Replaces L-P-403)	Standard Specification for Polytetrafluorethylene Molding and Extrusion Materials	Procedures.	MS21266
ASTM D21161 (Replaces L-P-389)	Standard Specification for Fluro-carbon Molding and Extrusion Materials	Procedure section. Table I requirements.	MS21266 MIL-I-23594
MS20995	Wire, Safety or Lock	Safety wire requirements.	MS33540

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-P-19468	Plastic Rod, Polyetrafluroethylene, Molded and Extruded	Any QPL item.	MS27488
EIA RS 359	Standard Colors for Color ID and Coating	Colors.	MS27488
MIL-STD-1344	Test Methods for Electrical Connectors	Method 3003, Insulation resistance.	MS27488
L-P-390	Plastic Molding and Extrusion Material, Polyethelyne and Copolymers (Low, Medium and High Density)	Type I, Class L, Grade optional. Type I, Class L, Grade 1. Type I, Class L, Grade 1.	MS90376 NAS820 NAS813
MIL-T-7928	Terminal Lug and Splice, Crimp Style Copper	Any QPL item.	MS25274
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes	Inspection level S-3 and AQL of 4.0%.	MIL-T-43435
FED-STD-191	Textile Test Methods	Method 5030, Thickness average of 5 to .001 in.; Method 4102, Elongation/Breakage average of 5 to 0.2% and .5 lb; Method 5651, Colorfastness; Method 2611, Wax content; Method 5760, Fungus Resistance; Method 5852, Aging.	MIL-T-43435
ASTM D792	Standard Test Methods for Specific Gravity (Relative Density) and Density of Plastics by Displacement	Method A.	MIL-I-23594
ASTM D149 (Replaces FED-STD-406, Method 4031)	Standard Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials	Summary of test methods, apparatus, hazards and sampling sections.	MIL-I-23594

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
ASTM D570 (Replaces FED-STD-406, Method 7031)	Standard Test Methods for Water Absorption of Plastics	Conditioning, procedure and reconditioning sections.	MIL-I-23594
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes	Inspection level S-3; AQL of 2.5%.	MIL-I-23594

The remaining third tier references, tiered to MIL-W-5088, are for guidance and information.

(1) MIL-W-8516 is the preferred material.
(2) Do not use for Navy application splicing.
(3) ASTM D786 is canceled with no superseding document.

First Tier (5 of 96 Documents)

MIL-E-5372	Fuse, Current Limiter Type, Aircraft	Vibratory stress survey requirements (ground and flight tests).	MIL-D-8708

Second and Third Tiers

All second and third tier references, tiered to MIL-E-5372, are for guidance and information.

First Tier (6 of 96 Documents)

MIL-E-5400	Electronic Equipment, Aerospace, General Specification for	Specified ambient temperature (3.24.1).	MIL-D-8708

Second and Third Tiers

All second and third tier references, tiered to MIL-E-5400, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (7 of 96 Documents)			
MIL-T-5522	Test Requirements and Methods for Aircraft Hydraulic and Emergency Pneumatic Systems	Requirements and quality assurance including accessibility and suitability of external connections.	MIL-D-8708
First Tier (8 of 96 Documents)			
MIL-C-5809	Circuit Breakers, Trip-Free, Aircraft, General Specification for	Any QPL item.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-C-5809, are for guidance and information.			
First Tier (9 of 96 Documents)			
MIL-T-5842	Transparent Areas on Aircraft Surfaces (Windshields and Canopies), Rain Removing and Washing Systems for Defrosting, Deicing, Defogging, General Specification for	Compliance of defogging system.	MIL-D-8708
Second Tier			
MIL-STD-210	Climatic Information to Determine Design and Test Requirements for Military Systems and Equipment	Ambient atmosphere conditions; 10% risk criteria requirements.	MIL-T-5842
The remaining second tier references, tiered to MIL-T-5842, are for guidance and information.			
Third Tier			
MIL-STD-810	Environmental Test Procedures and Engineering Guidelines	Test methods for atmospheric conditions.	MIL-STD-210
The remaining third tier references, tiered to MIL-T-5842, are for guidance and information.			

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (10 of 96 Documents)			
MIL-E-6051	Electromagnetic Compatibility Requirements, Systems	Intrasystem EMC and EMI general requirements for Naval acquisitions.	MIL-D-8708
Second Tier			
MIL-STD-704	Aircraft Electric Power Characteristics	Electrical power requirements ments including surges, ripples, voltages, etc.	MIL-E-6051
MIL-B-5087	Bonding, Electrical, and Lightning Protection for Aerospace Systems	Bonding and grounding provisions including bases and fixed sites; lightning protection requirements.	MIL-E-6051
MIL-C-5	Capacitors, Fixed, Mica-Dielectric, General Specification for	Any QPL item.	MIL-E-6051
MIL-F-15733	Filters and Capacitors, Radio Freq Interference, General Specification for	Any QPL item.	MIL-E-6051
MIL-STD-461	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference	Subsystems/equipment design requirements; predicted problem areas.	MIL-E-6051
MIL-STD-462	Electromagnetic Interference Characteristics, Measurements of	Subsystems/equipment design requirements; predicted problem areas.	MIL-E-6051
MS90298	Connector, Receptacle, Electric Connector	Grounding jack.	MIL-E-6051

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MS33645	Receptacle, Grounding, Installation of	Ground jack installation compliance.	MIL-E-6051
USAS C1	National Electrical Code	Grounding at bases and fixed sites.	MIL-E-6051
MIL-STD-454	Standard General Requirements for Electronic Equipment	Requirement 1, Safety Design Criteria; Requirement 5, Electrical Overload Protection.	MIL-E-6051
MIL-STD-1385 (Replaces MIL-P-24014)	Preclusion of Ordnance Hazards in Electromagnetic Fields; General Requirements for	Provisions to protect subsystems from inadvertent ignition or dudding caused by electromagnetic or electrostatic energy.	MIL-E-6051
MIL-C-11693	Capacitors, Feed Through, Radio Interference, Reduction, AC and DC (Hermetically Sealed in Metallic Cases), General Specification for	Any QPL item.	MIL-E-6051
MIL-C-889	Capacitors, By-Pass, Radio Interference, Reduction, Paper Dielectric, AC and DC (Hermetically Sealed in Metallic Cases), General Specification for	Any QPL item.	MIL-E-6051
MS25384	Electrostatic Discharger Jumper, Fuel Nozzle-to-Aircraft	Plug for grounding and bonding cables.	MIL-E-6051

The remaining second tier references, tiered to MIL-E-6051, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
Third Tier			
AN960	Washer, Flat	Al alloy untreated washer.	MS90298
MS25082	Nut, Plain, Hexagon, Electrical - Thin	Brass oxide plated nut.	MS90298
QQ-B-613	Brass, Leaded and Nonleaded: Flat Products (Plate, Bar, Sheet, Strip)	Brass rect for sleeve.	MS90298
QQ-B-750	Bronze, Phosphor; Bar, Plate, Rod, Sheet, Strip, Flat Wire, and Structural and Special Shaped Sections	Composition A.	MS90298
QQ-P-416	Plating, Cadmium (Electrodeposited)	Type II, Class 2.	MS90298
MS3943	Connector, Plug and Cap Electric, Grounding	Test plug; insertion and removal forces, life expectancy.	MS90298
MIL-STD-105	Sampling Procedures and Tables for Inspections by Attributes	Inspection level S-2; AQL of 1%.	MS90298
FED-STD-595	Colors	Color No. 33538, 37038.	MS33645
MIL-B-5087	Bonding, Electrical and Lightning Protection, for Aerospace Systems	Installation of receptacle.	MS33645
MIL-STD-1385	Preclusion of Ordnance Hazards in Electromagnetic Fields, General Requirements for	Requirements for systems or sub-systems utilizing electro explosive devices.	MIL-STD-461
MIL-STD-1377	Effectiveness of Cable, Connector and Weapon Enclosure Shielding and Filters in Preclusion Hazards of Electromagnetic Radiation to Ordnance, Measurement of	Effectiveness of cables connectors, shields and filters.	MIL-STD-461

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-STD-462	Electromagnetic Interference Characteristics, Measurement of	Test procedures for EMI.	MIL-STD-461

The remaining third tier references, tiered to MIL-E-6051, are for guidance and information.

First Tier (11 of 96 Documents)

MIL-I-6115	Instrument Systems, Pitot Tube and Flush Static Port Operated, Installation of	Requirements and quality assurance.	MIL-D-8708

Second Tier

AN5811	Tube, Pitot, Electrically Heated, "L" Shaped, Inverted	Requirements.	MIL-I-6115
AN5812	Tube, Pitot, Electrically Heated, "L" Shaped	Requirements.	MIL-I-6115
AN5813	Tube, Pitot, Electrically Heated	Requirements.	MIL-I-6115
MIL-A-8625	Anodic Coatings for Aluminum and Aluminum Alloys	Anodic film requirements.	MIL-I-6115
WW-T-700/4 (replaces WW-T-787)	Tube, Aluminum Alloy, Drawn, Seamless	Requirements and quality assurance.	MIL-I-6115
AN6270	Hose Assembly-Detachable Swivel Fitting, Low Pressure	Flexible hose and connection requirements.	MIL-I-6115
TT-S-1732 (Replaces JAN-A-669)	Sealing Compound; Pipe Joint and Thread, Lead Free, General Purpose	Anti-seize compound requirements.	MIL-I-6115
MS33656	Fitting End, Standard Dimensions for Flared Tube Connection and Gasket Seal	Drain fitting requirements.	MIL-I-6115

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
AN929-4	Cap Assembly, Pressure Seal Flared Tube	-4 assembly; requirements.	MIL-I-6115
AND10410(1)	Pitot Static and Pitot Tube - Wiring Diagram for	Wiring diagram requirements (electrical circuit for tubes with heater elements).	MIL-I-6115

The remaining second tier references, tiered to MIL-I-6115, are for guidance and information.

(1) AND10410 has been canceled with no superseding document.

Third Tier

MIL-C-5541	Chemical Conversion Coatings on Aluminum and Aluminum Alloys	Class 1A, brush applications.	MIL-A-8625
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes	Inspection level 2, AQL of 1.5%.	MIL-A-8625
ASTM B137	Standard Test Method for Measurements of Weight of Coating on Anodically Coated Aluminum	Specimens and procedures sections.	MIL-A-8625
ASTM B244	Standard Test Method for Measurement of Thickness of Anodic Coatings on Aluminum and Other Non-Conductive Coatings on Non-magnetic Metals	Specimens and procedures sections.	MIL-A-8625
FED-STD-151	Metals, Tests Methods	Method 520.	MIL-A-8625
ASTM B117 (Replaces Method 811 of FED-STD-151)	Standard Test Method of Salt Spray (Fog) Testing	Apparatus, salt solution, conditions in chamber, period and continuity of test and evaluation sections.	MIL-A-8625

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
ASTM G23	Standard Practice for Operating Light Exposure Apparatus (Carbon Arc Type) With and Without Water for Exposure of Nonmetallic Materials	General procedures and Methods 1, 2 and 3.	MIL-A-8625
ASTM D822	Standard Practice for Operating Light and Water Exposure Apparatus (Carbon Arc Type) for Testing Paint and Related Coatings and Materials	Procedures, exposure and evaluation of results sections.	MIL-A-8625
FED-STD-141	Paint, Varnish, Lacquer and Related Materials; Methods for Testing of	Method 6192.	MIL-A-8625
ASTM D2244	Standard Method for Calculation of Color Differences for Instrumentally Measured Color Coordinates	Summary of method and procedure sections.	MIL-A-8625
WW-T-700/GEN	Tube, Aluminum and Aluminum Alloy, Drawn, Seamless, General Specification for	Flattening, pressure, electromagnetic tests and quality assurance.	WW-T-700/4

The remaining third tier referenced, tiered to MIL-I-6115, are for guidance and information.

First Tier (12 of 96 Documents)

MIL-D-6728	Dampers; Engine Exhaust Flame and Glass	Test procedure for flame damping.	MIL-D-8708

Second and Third Tiers

All second and third tier references, tiered to MIL-D-6728, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (13 of 96 Documents)			
MIL-W-6729	Watertightness of Aircraft, Testing, General Specification for	Requirements and quality assurance of ground and flight aircraft watertightness of all systems.	MIL-D-8708
Second Tier			
SD-8706	General Specification for Design Examinations, Engineering, Aircraft Weapon Systems	Watertightness investigations and analyses; test and inspection procedures.	MIL-W-6729
NAVAIR 01-1A-509	Aircraft Weapons Systems, Cleaning and Corrosion Control	Cleaning procedure for the watertightness test.	MIL-W-6729
The remaining second tier references, tiered to MIL-W-6729, are for guidance and information.			
Third Tier			
MIL-T-22085	Tape, Pressure Sensitive, Adhesive, Preservation and Sealing	Any QPL item.	NAVAIR 01-1A-509
MIL-B-131	Barrier Materials, Waterproof, Flexible, Heat Sealable	Any QPL item.	NAVAIR 01-1A-509
TT-N-95	Naptha Aliphatic	Requirements.	NAVAIR 01-1A-509
The remaining third tier references, tiered to MIL-W-6729, are for guidance and information.			

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (14 of 96 Documents)			
MIL-L-6730	Lighting Equipment, Exterior, Aircraft (General Requirements for)	Requirements and quality assurance.	MIL-D-8708
Second Tier			
MIL-E-7080	Electric Equipment, Aircraft, Selection and Installation of	Exterior lighting equipment and controls installation.	MIL-L-6730
MIL-W-5088	Wiring, Aerospace Vehicle	Requirements and quality assurance.	MIL-L-6730
MIL-L-6723	Lights, Aircraft, General Specification for	Any QPL item.	MIL-L-6730
MIL-C-25050	Color, Aeronautical Lights and Lighting Equipment, General Requirements for	Exterior lighting requirements (aviation colors).	MIL-L-6730
MIL-STD-810 (Replaces MIL-E-5272)	Environmental Test Methods and Engineering Guidelines	Environmental requirements.	MIL-L-6730
MIL-STD-461	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference	Radio interference requirements.	MIL-L-6730
MIL-L-21652	Light, Beacon, Anticollision, Aircraft, General Specification for	Any QPL item.	MIL-L-6730
MIL-L-81174	Lights, Landing, Aircraft, Retractable	Any QPL item.	MIL-L-6730

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-A-19736	Air Refueling Systems, General Specification for	Requirements for refueling and tanker signal lights.	MIL-L-6730
MIL-I-18079	Installation of Angle of Attack and Sideslip Systems	Requirements and quality assurance for approach light system.	MIL-L-6730
MS25318	Light, Approach, 28 V	Requirements.	MIL-L-6730
MS25219	Light-Navigational and Warning, Aircraft	Type 1683 lamp.	MIL-L-6730
MIL-C-6781	Control Panel: Aircraft Equipment, Rack or Console Mounted	Control switch requirements.	MIL-L-6730
MIL-F-26301 (Replaces MIL-F-7929)	Flashers, Aircraft Navigational Light, General Specification for	Any QPL item.	MIL-L-6730

There are no additional second tier references.

Third Tier

MIL-L-6723	Lights, Aircraft, General Specification for	Any QPL item.	MIL-E-7080
MIL-L-18276	Lighting, Aircraft Interior; Installation of	Naval aircraft lighting.	MIL-E-7080
MIL-STD-462	Electromagnetic Emission and Susceptibility, Test Methods for	Emission limit requirements.	MIL-STD-461
MIL-C-25050	Color, Aeronautical Lights and Lighting Equipment, General Specification for	Identification color.	MS25318
MIL-STD-810	Environmental Test Methods and Engineering Guidelines	Method 514, Vibration; Method 516, Shock; Method 513, Acceleration.	MS25318

All remaining third tier references, tiered to MIL-L-6730, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (15 of 96 Documents)			
MIL-E-7016	Electric Load and Power Source Capacity, Analysis of	Preliminary load analysis requirements.	MIL-D-8708
First Tier (16 of 96 Documents)			
MIL-E-7080	Electrical Equipment; Aircraft, Selection and Installation of	Requirements and quality assurance except for selection.	MIL-D-8708
Second Tier			
MIL-F-7179	Finishes, Coatings, and Sealants for the Protection of Aerospace Weapon Systems	Finish and coating requirements for electrical systems.	MIL-E-7080
ASTM D495 (Replaces L-P-406)	Standard Test Method for High Voltage, Low Current Dry Arc Resistance for Solid Electrical Insulation	Apparatus, safety, conditioning and procedure for determining arc resistance time.	MIL-E-7080
MIL-STD-810 (Replaces MIL-E-5272)	Environmental Procedures and Engineering Guidelines	Explosion proof tests.	MIL-E-7080
MS90298	Connector, Receptacle, Electric Connector	Entire document.	MIL-E-7080
MS33645	Receptacle, Grounding, Installation of	Entire document.	MIL-E-7080
MIL-B-5087	Bonding, Electrical, and Lightning Protection, for Aerospace Systems	Jumper wire requirements for providing current return paths.	MIL-E-7080
MIL-E-6051	Electromagnetic Compatibility Requirements, Systems	Installation requirements.	MIL-E-7080
MIL-I-6181	Interference Control Requirements, Aircraft Equipment	Radio interference reduction requirements.	MIL-E-7080

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-F-15733	Filters and Capacitors, Radio Frequency Interference, General Specification for	Any QPL item.	MIL-E-7080
MIL-C-7762	Compasses, Installation of	Maximum compass deviations.	MIL-E-7080
MS33540	Safety Wiring and Cotter Pinning, General Practices for	Safety wiring practice.	MIL-E-7080
MIL-W-5088	Wiring, Aerospace Vehicles	Installation requirements.	MIL-E-7080
MIL-R-6809(1)	Regulator, voltage, 30 Vdc, Generator, General Specification for	Requirements and quality assurance.	MIL-E-7080
MIL-B-83769 (Replaces MIL-B-6146)	Batteries, Storage, Lead-Acid, General Specification for	Any QPL item.	MIL-E-7080
AND10441(2)	Battery Installation	Entire document.	MIL-E-7080
DOD-C-7115	Converter, Aircraft, General Specification for	Any QPL item.	MIL-E-7080
MIL-I-7032	Inverter, Aircraft, General Specification for	Any QPL item.	MIL-E-7080
MIL-M-8609	Motors, DC, 28V, System, Aircraft, General Specification for	Requirements and quality assurance for DC motors.	MIL-E-7080
MIL-M-7969	Motors, AC, 400 Cycle, 115/200V, System, Aircraft, General Specification for	Requirements and quality assurance for AC motors.	MIL-E-7080
MIL-G-21480 (Replaces MIL-G-6099)	Generator System, 400 Hz Ac, Aircraft, General Specification for	Any QPL item. for DC generators.	MIL-E-7080

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-G-6162	Generator and Starter Generator Electric Direct Current, Nominal 30 Volts, Aircraft, General Specification for	Any QPL item.	MIL-E-7080
MIL-L-6723	Lights, Aircraft, General Specification for	Any QPL item.	MIL-E-7080
MIL-L-6730	Lighting Equipment; Exterior, Aircraft (General Requirements for)	Exterior lighting equipment installation.	MIL-E-7080
MIL-L-5667	Lighting Equipment, Aircraft Instrument Panel, General Specification for Installation	Instrument lighting installation.	MIL-E-7080
MIL-L-18276	Lighting of Aircraft Interior, Installation	Naval aircraft lighting requirements.	MIL-E-7080
AN2552	Receptacle, External Power, 28 Vdc	Entire document.	MIL-E-7080
MS25018	Connector, Receptacle, External Electric Power, Aircraft, 28 Vdc, Jet Starting	Entire document.	MIL-E-7080
MIL-A-6752	Ammeters, Voltmeters and Loadmeters, Direct Current	Any QPL item.	MIL-E-7080
MIL-V-6753	Voltmeter, 0-150 Volt, 330 to 1200 Cycle, Alternating Current	Any QPL item.	MIL-E-7080
MIL-S-61	Shunts, Instrumental, External, 50mV (Light Weight Type)	Requirements and quality assurance.	MIL-E-7080
MIL-S-3950	Switch, Toggle, General Specification for	Any QPL item.	MIL-E-7080

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MS3505 (Replaces AN3114)	Cover for Use With MS90362, External Power Receptacle	Entire document.	MIL-E-7080
MS90362 (Replaces AN3114)	Connector, Receptacle, External Electric Power, Aircraft, 115/200V, 400Hz	Entire document.	MIL-E-7080
MIL-S-8834	Switch, Toggle, Positive Break, General Specification for	Any QPL item.	MIL-E-7080
MS33630	Switch, Toggle, Installation of	Entire document.	MIL-E-7080
MIL-STD-203	Aircrew Station Controls and Displays: Assignment, Location, and Actuation of, for Fixed Wing Aircraft	Orientation of switches.	MIL-E-7080
MIL-STD-250	Aircrew Station Controls and Displays for Rotary Wing Aircraft	Orientation of switches.	MIL-E-7080
MIL-G-7703	Guard, Switch, General Specification for	Any QPL item.	MIL-E-7080
MIL-S-8805 (Replaces MIL-S-6743 and MIL-S-6744)	Switches and Switch Assemblies, Sensitive and Push Action (Snap Action), General Specification for	Any QPL item.	MIL-E-7080
MIL-S-6746(3)	Switch, Rotary, Shielded, Aircraft Ignition	Requirements and quality assurance.	MIL-E-7080
MIL-S-6807	Switch, Rotary, Selector Power, General Specification for	Any QPL item.	MIL-E-7080

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-C-5809	Circuit Breaker, Trip-Free, Aircraft, General Specification for	Any QPL item.	MIL-E-7080
MS33590	Circuit Breaker Installation	Entire document.	MIL-E-7080
MIL-F-5372	Fuse, Current Limiter Type, Aircraft	Any QPL item.	MIL-E-7080
MIL-F-15160	Fuse, Instrument, Power and Telephone	Any QPL item.	MIL-E-7080
MIL-R-6749	Rheostat, Aircraft Power	Any QPL item.	MIL-E-7080
MIL-R-26	Resistor, Fixed, Wire-Wound (Power Type), General Specification for	Any QPL item.	MIL-E-7080
MIL-R-6106	Relays, Electric, Aircraft, General Specification for	Any QPL item.	MIL-E-7080
MIL-C-5026	Cutout, Relay, Engine Generator	Any QPL item.	MIL-E-7080

The remaining second tier references, tiered to MIL-E-7080, are for guidance and information.

Third Tier

MIL-B-5087	Bonding, Electrical and Lightning Protection, for Aerospace Systems	Exterior bonding and connections; receptacle installation.	MIL-F-7179 MS33645
MIL-S-81733	Sealing and Coating Compound, Corrosion Resistant	Any QPL item.	MIL-F-7179
MIL-S-8802	Sealing Compound, Temperature Resistant, Integral Fuel Tanks and Fuel Cell Cavities, High Adhesion	Any QPL item.	MIL-F-7179

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-S-83430	Sealing Compound, Integral Fuel Tank and Fuel Cell Cavities, Intermittent Use to 360°F	Requirements.	MIL-F-7179
MIL-C-81774	Control Panel, Aircraft, General Specification for	Spacing of switches.	MIL-STD-203
QQ-B-613	Brass, Leaded and Nonleaded: Flat Products (Plate, Bar, Sheet and Strip)	Requirements.	MS90298
QQ-B-750	Bronze, Phosphor; Bar, Plate, Rod, Sheet, Strip, Flat Wire, and Structural and Special Shaped Sections	Composition A.	MS90298
QQ-P-416	Plating, Cadmium (Electrodeposited)	Type II, Class 2.	MS90298
MIL-STD-105	Sampling Procedures and Tables	Inspection level S-2; AQL of 1%.	MS90298
FED-STD-595	Colors	Color No. 33538 and 37038.	MS33645
MS20995	Wire, Safety or Lock	Material requirements.	MS33540
FED-STD-595	Colors	Color Nos.: 13655, 23655, 15102, 25102.	MS33540
MIL-STD-411	Aircrew Station Signals	Visual aircrew station signals.	MIL-L-18276
MIL-C-25050	Colors, Aeronautical Lights and Lighting Equipment, General Requirement for	Red light requirements; white light requirements.	MIL-L-18276
MIL-STD-203	Aircrew Station Controls and Displays: Assignment, Location and Actuation of, for Fixed Wing Aircraft	Lighting fixture installation; visual aircrew signals; illumination.	MIL-L-18276

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-STD-250	Aircrew Station Controls and Displays for Rotary Wing Aircraft	Lighting fixture installation; visual aircrew signals; illumination.	MIL-L-18276
MIL-L-25467	Lighting, Integral, Red, Aircraft Instrument, General Specification for	Primary lighting system; integrally lighted instruments.	MIL-L-18276
MS25027	Light Assembly, Cockpit, Fixed	Secondary instrument lighting systems.	MIL-L-18276
MIL-P-7788	Panels, Information, Integrally Illuminated	Any QPL item.	MIL-L-18276
AN3037-8A	Light Assembly, Cabin Dome	Cockpit lights for emergency maintenance and flight.	MIL-L-18276
MIL-P-6781	Control Panel: Aircraft Equipment Rack or Console Mounted	Standard control panels for control of lights.	MIL-L-18276
MIL-B-5087	Bonding, Electrical and Lightning Protection for Aerospace Vehicles	Instrument lighting installation requirements.	MIL-L-5667
MIL-W-5088	Wiring, Aerospace Vehicles	Instrument lighting installation requirements.	MIL-L-5667
MIL-C-25050	Colors, Aeronautical Lights and Lighting Equipment, General Requirement for	Red color requirements for external lighting.	MIL-L-5667
MIL-L-27160	Lighting, Instrument, Integral, White, General Specification for	White lighting requirements for internal lighting.	MIL-L-5667
MIL-L-25467	Lighting, Integral, Red, Aircraft Instrument, General Specification for	Red lighting requirements for internal lighting.	MIL-L-5667

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-L-5057	Light, Instrument, Individual, General Specification for	Post lighting requirements.	MIL-L-5667
MS25027	Light Assembly, Cockpit, Fixed	Secondary lighting system (flood-lights).	MIL-L-5667
MS33568	Drive, Square Mounting Flange, With Insolute Spline Pinion	Entire document.	MIL-M-8609 MIL-M-7969
MS33569	Drive, Round Mounting Flange, With Involute Spline Pinion	Entire document.	MIL-M-8609 MIL-M-7969
MS33570	Drive, Square Mounting Flange With Round Shaft and Key	Entire document.	MIL-M-8609 MIL-M-7969
MS33571	Drive, Round Mounting Flange With Round Shaft and Key	Entire document.	MIL-M-8609 MIL-M-7969
MIL-STD-838 (Replaces MIL-L-6880)	Lubrication of Military Equipment	Requirements and quality assurance.	MIL-M-8609 MIL-M-7969
MIL-STD-195	Marking of Connections for Electric Assemblies	External termination of wiring.	MIL-M-8609 MIL-M-7969
MIL-I-6181	Interference Control Requirements, Aircraft Equipment	Requirements.	MIL-M-8609 MIL-M-7969
MIL-STD-704	Electrical Power Characteristics	Input power requirements; Category C.	MIL-M-8609 MIL-M-7969
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys	Requirements and quality assurance.	MIL-M-8609 MIL-M-7969

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-C-5541	Chemical Conversion Coatings on Aluminum and Aluminum Alloys	Requirements and quality assurance.	MIL-M-8609 MIL-M-7969
MIL-M-3171	Magnesium Alloy, Processes for Pretreatment and Prevention of Corrosion on	Requirements and quality assurance.	MIL-M-8609 MIL-M-7969
QQ-P-416	Plating, Cadmium (Electrodeposited)	Type I or II.	MIL-M-8609 MIL-M-7969
MIL-STD-810 (Replaces MIL-E-5272)	Environmental Test Methods and Engineering Guidelines	Shock, Method 516; Vibration, Method 514; Humidity, Method 507; Salt Spray, Method 509; Sand and Dust, Method 510; Fungus, Method 508; Explosion, Method 511.	MIL-M-8609 MIL-M-7969
MIL-M-14	Molding Plastics and Molded Plastic Parts, Thermosetting	CFI-10 or higher impact strength type.	MIL-S-61
MIL-P-15035	Plastic Sheet: Laminated, Thermosetting, Cotton-Fabric-Base, Phenolic Resin	Requirements and quality assurance.	MIL-S-61
QQ-S-571	Solder; Tin Alloy, Tin-Lead Alloy, and Lead Alloy	Any QPL item.	MIL-S-61
QQ-B-613	Brass; Leaded and Nonleaded; Flat Products	Brass requirements.	MIL-S-61
QQ-B-626	Brass, Leaded and Nonleaded: Rod, Shapes, Forgings and Flat Products With Finished Edges	Brass requirements.	MIL-S-61
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes	AQL of 1.0.	MIL-S-61

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-STD-202	Test Methods for Electronic and Electrical Component Parts	Method 301, Dielectric Withstanding Voltage.	MIL-S-61

The remaining third tier references, tiered to MIL-E-7080, are for guidance and information.

(1) MIL-R-6809 is cancelled with no superseding document.
(2) AN10441 is cancelled with no superseding document.
(3) MIL-S-6746 is cancelled with no superseding document.

First Tier (17 of 96 Documents)

MIL-A-8861	Airplane Strength and Rigiidity Flight Loads	Symmetrical flight conditions, unsymmetrical flight conditions, spins, gust loads.	MIL-D-8708

Second and Third Tiers

All documents tiered to MIL-A-8861, are for guidance and information.

First Tier (18 of 96 Documents)

MIL-C-7762	Compasses, Installation of	Requirements and quality assurance.	MIL-D-8708

Second Tier

MIL-STD-765	Compass, Swinging, Aircraft, General Requirements for	Magnetic heading ground and flight requirements.	MIL-C-7762
MIL-C-26524(1)	Calibrator Set, Magnetic Compass, Type A/E37T-10	Requirements and quality assurance.	MIL-C-7762

The remaining second tier references, tiered to MIL-C-7762, are for guidance and information.

Third Tier

All third tier references, tiered to MIL-C-7762, are for guidance and information.

(1) MIL-C-26524 is cancelled with no superseding document.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (19 of 96 Documents)			
MIL-F-7872	Fire and Overheat Warning Systems Conditions, Aircraft Test and Installation of	Fire detection system tests; ground and flight operation of fire warning system.	MIL-D-8708
Second Tier			
MIL-E-5400	Electronic Equipment, Aerospace, General Specification for	Materials for fire fighting/ detection; internal wiring.	MIL-F-7872
MIL-STD-704	Aircraft Electric Power Characteristics	Transient voltage shall not result in a false alarm; power variation.	MIL-F-7872
MIL-STD-411	Aircrew Station Signals	Fire warning signal requirements; legend-type warning system with "FIRE" in red; marking of warning system; overheat signal requirements.	MIL-F-7872
MS25231-313	Lamps, Incandescent, Center Contact, Miniature Bayonet Base (T-3-1/4 Bulb)	Light signal lamp requirements for fire warning.	MIL-F-7872
MIL-C-26482	Connectors, Electric, Circular, Miniature, Quick Disconnect	Any QPL item.	MIL-F-7872
MIL-R-6106	Relay, Electric, Aerospace, General Specification for	Any QPL item.	MIL-F-7872

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-E-7080	Electric Equipment, Aircraft, Selection and Installation of	Installation of electrical and electronic components of the fire warning system.	MIL-F-7872
MIL-I-8700	Installation and Test of Electronic Equipment in Aircraft, General Specification for	Installation of electrical and electronic components of the fire warning system.	MIL-F-7872
MIL-W-5088	Wiring Aerospace Vehicle	Installation of fire warning system wiring except for wire used in fire or overheat zone.	MIL-F-7872
MIL-E-25038	Wire, Electrical, High Temperature and Fire Resistant, Aircraft	Any QPL item.	MIL-F-7872
MIL-STD-810	Environmental Test Methods and Engineering Guidelines	Environmental conditions including high and low temperature, altitude, humidity, rain, vibration, salt spray and noise.	MIL-F-7872
MIL-I-6181	Interference Control Requirements Aircraft Equipment	EMI requirements.	MIL-F-7872

The remaining second tier references, tiered to MIL-F-7872, are for guidance and information.

Third Tier

MIL-STD-454	Standard General Requirements for	Requirements 17 and 69 for printed wiring and internal wiring.	MIL-E-5400
MIL-C-25050	Colors, Aeronautical Lights and Lighting Equipment, General	Color and brightness of warning signals.	MIL-STD-411

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-M-18012	Markings for Aircrew Station Displays, Design, and Configuration	Conformance of letter/number.	MIL-STD-411
MIL-STD-810 (Replaces MIL-E-5272)	Environmental Test Methods and Engineering Guidelines	Aeronautical explosion proof tests for electronic equipment.	MIL-E-7080
MIL-I-6051	Interference Limits and Methods of Measurements, Electrical and Electronic Installation in Airborne Weapons Systems and Associated Equipment	Limit requirements for air vehicles.	MIL-I-6181

The remaining third tier references, tiered to MIL-F-7872, are for guidance and information.

First Tier (20 of 96 Documents)

MIL-G-7940	Gages, Liquid Quantity, Capacitor Type, Installation and Calibration of	Requirements and quality assurance.	MIL-D-8708

Second Tier

MS20659	Terminal, Lug, Crimp Style, Copper, Uninsulated, Class I	Entire document.	MIL-G-7940

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-W-22759/1 (Replaces MIL-W-7139)	Wire, Electric, Fluropolymer-Insulated, TFE and TFE Coated Glass, Silver-Coated Copper Conductor	Requirements for unshielded connector cables.	MIL-G-7940
MIL-W-16878	Wire, Electrical, Insulated, General Specification for	Requirements for unshielded connector cables.	MIL-G-7940
MIL-C-17	Cables, Radio Frequency, Coaxial, Dual Coaxial, Twin Conductor, and Twin Lead	Any QPL item.	MIL-G-7940
MIL-W-5088	Wiring, Aerospace Vehicle	Installation requirements for electrical accessories except for connectors.	MIL-G-7940
MIL-C-26482	Connector, Electric, Circular, Miniature, Quick Disconnect, Environment Resisting	Any QPL item.	MIL-G-7940
MIL-C-26500	Connector, General Purpose, Electrical, Miniature, Circular, Environment Resisting, Established Reliability, General Specification for	Any QPL item.	MIL-G-7940

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-W-22759/2 (Replaces MIL-W-7139)	Wire, Electric, Fluropolymer-Insulated, TFE and TFE Coated Glass, Nickel Coated Copper Conductor	Requirements for unshielded cables.	MIL-G-7940
MIL-C-81511	Connector, Electrical, Circular, High Density, Quick Disconnect, Environment Resisting	Any QPL item.	MIL-G-7940
MIL-STD-454	Standard General Requirements for	Requirement 5, Soldering.	MIL-G-7940
QQ-S-571	Solder; Lead Alloy, Tin Lead Alloy, and Tin Alloy, Flux Cored Ribbon and Wire, and Solid Form	Any QPL item.	MIL-G-7940
MIL-B-5087	Bonding, Electrical and Lightning Protection, for Aerospace Vehicles	Aircraft structure bonding.	MIL-G-7940
MIL-STD-704	Aircraft Electric Power Requirements	Operational power requirements.	MIL-G-7940
MS29576(1)	Flange, Attachment, Molded Tank Flush and Recessed, Full Molded, Circular	Entire document.	MIL-B-7940
MIL-G-26988	Gage, Liquid Quantity, Capacitor Type, Transistorized, General Specification	Table I.	MIL-G-7490

All remaining second tier references, tiered to MIL-G-7840, are for guidance and information.

(1) This reference has been cancelled with no superseding document.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
Third Tier			
QQ-C-502	Copper Rods and Shapes and Flat Products With Finished Edges (Flat Wire, Strips and Bars)	Class A.	MS26059
ASTM B75	Standard Specification for Seamless Copper Tube	General requirements, chemical composition, mechanical properties, non-destructive testing and electrical resitivity sections.	MS26059
MIL-W-5086	Wire, Electric, Polyvinyl Chloride Insulated, Copper or Copper Alloy	Any QPL item.	MS26059
MIL-W-22759 /1, /9, /11	Wire, Electric, Fluoropolymer Insulated, Copper or Copper Alloy	Any QPL item.	MS26059
MIL-W-81381 /1, /3, /7	Wire, Electric, Fluoropolymer Insulated, Copper or Copper Alloy	Any QPL item.	MS26059
MIL-C-22520/24	Crimping Tools, Terminal, Hand or Power Actuated, Wire Termination	Requirements.	MS26059
MIL-F-14256	Flux, Soldering, Liquid (Rosin Base)	Any QPL item.	MIL-STD-454
MIL-P-28809	Printed Wiring Assemblies	Requirements for cleanliness.	MIL-STD-454
QQ-S-571	Solder; Lead Alloy, Tin Lead Alloy, and Tin Alloy, Flux Cored Ribbon and Wire, and Solid Form	Any QPL item.	MIL-STD-454
MIL-T-81533	1.1.1 Trichloroethane (Methyl Chloroform) Inhibited, Vapor Degreasing	Non-corrosive solvent requirements.	MIL-STD-454

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
TT-I-735	Isopropyl Alcohol	Type III.	MIL-STD-454
O-E-760	Ethyl Alcohol (Ethanol); Denatured Alcohol; Proprietary Solvents and Special Industrial Solvents	Type III.	MIL-STD-454
O-T-236	Tetrachloroethylene (Percholoroethylene), Technical	Type III.	MIL-STD-454
MIL-STD-750	Test Methods for Semiconductor Devices	Method 2026, Semiconductors.	MIL-STD-454
MIL-STD-1512 (Replaces MIL-STD-833)	Electroexplosive Subsystems, Electronically Initiated, Design, Requirements and Test Methods	Method 2003, Microelectronics.	MIL-STD-454
MIL-STD-202	Test Methods for Electronic and Electrical Component Parts	Method 208, other electrical parts.	MIL-STD-454
MIL-P-81728	Plating, Tin Lead (Electrodeposited)	Requirements and quality assurance.	MIL-STD-454
MIL-STD-275	Printed Wiring for Electronic Equipment	Wire attachment requirements.	MIL-STD-454
MIL-P-50884	Printed Wiring, Flexible and Rigid-Flex	Wire attachment requirements.	MIL-STD-454
AN960	Washer, Flat	Light or heavy series only.	MIL-B-5087
AN935	Washer, Lock-Spring	Light series, temperature not to exceed 400°F.	MIL-B-5087
MS35338 (Replaces MS35337)	Washer, Lock-Spring, Helical, Regular (Medium) Series	Entire document, temperature to exceed 400°F.	MIL-B-5087

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MS35340 (Replaces MS35339)	Washer, Lock-Spring, Helical, Regular (Heavy) Series	Entire document, temperature to exceed 400°F.	MIL-B-5087
MS25083	Jumper Assembly, Electrical Bonding and Current Return	Entire document, temperature not to exceed 300°F.	MIL-B-5087
AN735	Clamp, Loop Type Bonding	Entire document, except for zinc plating.	MIL-B-5087

The remaining third tier documents, tiered to MIL-G-7940, are for guidance and information.

First Tier (21 of 96 Documents)

MIL-B-8565	Battery Storage, Aircraft, General Specification for	Any QPL item.	MIL-D-8708

Second and Third Tiers

All second and third tier references, tiered to MIL-B-8565, are for guidance and information.

First Tier (22 of 96 Documents)

MIL-A-8591	Airborne Stores, Suspension Equipment and Aircraft-Store Interface (Carriage Phase), General Design Criteria for	Time for arming and rearming for ground functional tests.	MIL-D-8708

Second and Third Tiers

All second and third tier references, tiered to MIL-A-8591, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (23 of 96 Documents)			
MIL-I-8671	Installation of Droppable Stores and Associated Release Systems	Ease of rearming/specific time requirement for rearming (3.8).	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-I-8671, are for guidance and information.			
First Tier (24 of 96 Documents)			
ANSI Z39.18	Scientific and Technical Reports	Entire document.	MIL-D-8708
First Tier (25 of 96 Documents)			
MIL-I-8675	Installations: Aircraft Armor	Rearming time requirements.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-I-8675, are for guidance and information only.			

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (26 of 96 Documents)			
NAVAIRINST 13034.1	Flight Clearance Policies	Entire NAVAIR INSTRUCTION.	MIL-D-8708
First Tier (27 of 96 Documents)			
MIL-C-8678	Cooling Requirements of Power Plant Installations	Tables I and V.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-C-8678, are for guidance and information.			
First Tier (28 of 96 Documents)			
MIL-D-8683	Design and Installation of Gaseous Oxygen Systems in Aircraft, General Specification for	Requirements and quality assurance.	MIL-D-8708
First Tier (29 of 96 Documents)			
MIL-I-8700	Installation and Test of Electronic Equipment in Aircraft, General Specification for	Installation requirements.	MIL-D-8708

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
Second Tier			
MIL-F-7179(1)	Finishes, Coatings and Sealants for the Protection of Aerospace Weapon Systems	Finish and coating for metals.	MIL-I-8700
MIL-B-5087(3)	Bonding, Electrical, and Lightning Protection, for Aerospace Systems	Non-metal and metal bonding requirements including finish and coating; control panel bonding; RFI requirements; installation requirements for wiring, cabling, connectors; junction box requirements; design, construction and tests of radomes; lightning protection.	MIL-I-8700
MIL-STD-454	Standard General Requirements for Electronic Equipment	Requirement 22, Parts Selection and Control; Requirement 16, Dissimilar Metals; Requirement 47, Encapsulation and Embedment; Requirement 62, Human Engineering; Requirement 58, Switches; Requirement 57, Relays; Requirement 1, Safety Design Criteria; Requirement 33, Resistors; Requirement 10, Electrical Connectors; Requirement 53, Waveguides; Requirement 8, Electrical Overload Protection; Requirement 37, Circuit Breakers; Requirement 39, Fuses; Requirement 36, Accessibility; Requirement 35, Reliability.	MIL-I-8700

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-C-6781	Control Panel: Aircraft Equipment, Rack or Console Mounted	Console mounted requirements (Type I).	MIL-I-8700
MIL-P-7788	Panels, Information, Integrally Illuminated	Any QPL item.	MIL-I-8700
MIL-F-25173	Fasteners, Control Panel, Aircraft Equipment	Any QPL item.	MIL-I-8700
MIL-C-172	Cases: Bases, Mounting; and Mounts Vibration (for Use With Electronic Equipment in Aircraft)	Any QPL item.	MIL-I-8700
MIL-M-81288(2)	Mounting Bases, Flexible Plastic Foam	Requirements.	MIL-I-8700
MS33630	Switch, Toggle, Installation of	Installation requirements.	MIL-I-8700
MIL-E-5400	Electronic Equipment, Aerospace, General Specification for	Hermetically sealed relay requirements for airborne electronic equipment; shock and vibration maximum limits.	MIL-I-8700
MIL-E-7080	Electronic Equipment, Aircraft, Selection and Installation of	Aircraft electrical equipment applications below 55,000 feet - non-hermetic sealed relays; circuit protection devices.	MIL-I-8700
MIL-W-5088(3)	Wiring, Aerospace Vehicle	Installation requirements; cable length; junction box requirements.	MIL-I-8700

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-E-6051	Electromagnetic Compatibility Requirements, Systems	Junction box functional requirements; electromagnetic compatibility; filter installation.	MIL-I-8700
MS21047	Nut, Self-Locking, Plate, Two Lug, Low Height, Steel, 125 ksi, 450°F	Plating requirements.	MIL-I-8700
MS21048	Nut, Self-Locking, Plate, Two Lug, Low Height, CRES, 125 ksi, 450°F and 800°F	Plating requirements.	
MIL-A-9094	Arrestor, Lighting, General Specification for, Design of	Requirements and quality assurance.	MIL-I-8700
MIL-S-9129	Static Discharger AN/ASA-3B	Any QPL item.	MIL-I-8700
MIL-C-7762	Compasses, Installation of	Maximum magnetic compass deviations.	MIL-I-8700
MIL-F-15733	Filters, Radio Interference	Any QPL item.	MIL-I-8700

The remaining second tier references, tiered to MIL-I-8700, are for guidance and information.

(1) MIL-B-5087 requirements take precedence.
(2) Except for frequencies and amplitude of MIL-E-5400, Figure 3.
(3) In the case of a discrepancy, the requirements of the acquiring activity shall govern.

Third Tier

MS25212	Control Panel, Console Type, Aircraft Equipment, Base Dimensions	Type I panels.	MIL-C-6781
MS25213	Control Panel, Aircraft Equipment, Typical Installation	Installation requirements.	MIL-C-6781

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-STD-1472	Human Engineering Design Criteria for Military Systems, Equipment and Facilities	Control requirements.	MIL-C-6781
MIL-C-81774	Control Panel, Aircraft, General Requirements for	Control requirements.	MIL-C-6781
MIL-W-5088	Wiring, Aerospace Vehicle	External interconnecting wiring requirements.	MIL-C-6781
MIL-M-18012	Markings for Aircrew Station Displays Design and Configuration of	Arrangement, location, operation and marking of controls.	MIL-C-6781
MIL-K-25049	Knobs, Control, Electronic Equipment, General Specification for	Any QPL item.	MIL-C-6781
MS33742	Shaft, Control Knob	Rotary control shaft requirements.	MIL-C-6781
MIL-C-26482	Connector, Electrical, Circular Miniature, Quick Disconnect, (Environmental Resisting)	Any QPL item.	MIL-C-6781
TT-E-489	Enamel, Alkyd, Gloss (for Exterior and Interior Surfaces)	Any QPL item.	MIL-C-6781
TT-E-527	Enamel, Alkyd, Lusterless	Black non-reflecting.	MIL-C-6781
TT-E-1757	Primer Coating, Zinc Chromate, Low-Moisture-Sensitivity	Exterior surface finish.	MIL-C-6781
MIL-R-6106	Relay, Electric, Aerospace, General Specification for	Any QPL item.	MIL-E-7080
QQ-P-416	Plating, Cadmium (Electrodeposited)	Type II, Class 2.	MS21047

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
AMS 2410	Silver Plating, Nickel Strike, High Bake	Silver plate of threaded surfaces for 800°F only.	MS21048
MIL-STD-454	Standard General Requirements for Electronic Equipment	Requirement 57, Relays.	MIL-E-5400
TT-L-32 (Replaces MIL-C-6806)	Lacquer, Cellulose Nitrate, Gloss for Aircraft Use	Lacquer requirements for refinishing inspection.	MIL-B-5087
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes	Sampling requirements with an AQL of 2.5.	MIL-A-9094
MIL-STD-202	Test Methods for Electrical and Electronic Component Parts	Method 305, value of series capacitor; Method 303, value of bleeder resistor; Method 112, Test condition C, Procedure I; Method 106, Figure 106-1; Method 101, Test condition B; Method 110, Test condition A; Method 107, Test condition A; Method 204, Test condition C; Method 205, Test condition B; Method 211, Test condition A and B.	MIL-A-9094
MIL-F-81334	Foam, Plastic, Flexible, Open Cell, Polyester Type Polyurethane	Requirements and quality assurance.	MIL-M-81288
MIL-A-8625	Anodic Coatings for Aluminum and Aluminum Alloys	Anodizing requirements for alloys except for 3003, 5052, 6053, 6061, 6063 and 7072.	MIL-M-81288

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-F-18264	Finishes, Organic, Weapons Systems, Application and Control of	Application requirements and quality assurance.	MIL-F-7179
MIL-S-5002	Surface Treatments and Inorganic Coatings for Metal Surfaces of Systems	Requirements.	MIL-F-7179
MIL-S-8516	Sealing Compound, Polysulfide Rubber, Electric Connectors and Electric Systems, Chemically Cured	Any QPL item.	MIL-STD-454
MIL-I-16923	Insulating Compound, Electrical, Embedding	Any QPL item.	MIL-STD-454
MIL-S-23586	Sealing Compound, Electrical, Silicone Rubber, Accelerator Required	Nonreversion type material requirements.	MIL-STD-454
MIL-M-24041	Molding and Potting Compound, Chemically Cured, Polyurethane	Any QPL item.	MIL-STD-454
MIL-I-81550	Insulating Compound, Electrical, Embedding, Reversion, Resistant Silicone	Any QPL item.	MIL-STD-454
MIL-S-12285	Switch, Thermostatic	Any QPL item.	MIL-STD-454
MIL-S-15743	Switch, Rotary, Enclosed	Switch requirements.	MIL-STD-454
MIL-S-83731	Switch, Toggle, Unsealed and Sealed Toggle, General Specification for	Any QPL item.	MIL-STD-454
MIL-R-28750	Relay, Solid State, General General Specification for	Any QPL item.	MIL-STD-454

The remaining third tier references, tiered to MIL-I-8700, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (30 of 96 Documents)			
MIL-F-8785	Flying Qualities of Piloted Airplanes	Classification, natural and artificial stall warning requirements, maximum number of spins for recovery, maximum control force values.	MIL-D-8708
First Tier (31 of 96 Documents)			
MIL-F-9490	Flight Control Systems - Design, Installation and Test of Piloted Aircraft, General Specification for	Requirements and quality assurance for automatic flight control system.	MIL-D-8708

Second and Third Tiers

All documents tiered to MIL-F-9490 are for guidance and information.

First Tier (32 of 96 Documents)

MIL-D-85520	Design and Installation of On Board Oxygen Generating Systems in Aircraft, General Specification for	Requirements, quality assurance provisions.	MIL-D-8708

Second and Third Tiers

All second and third tier references, tiered to MIL-D-85520, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (33 of 96 Documents)			
MIL-L-85762	Lighting, Aircraft, Interior Night Vision Imaging System (NVIS) Compatible	Requirements, quality assurance provisions.	MIL-D-8708
Second and Third tiers			
All second and third tier references, tiered to MIL-L-85762, are for guidance and reference.			
First Tier (34 of 96 Documents)			
MIL-A-8860	Airplane Strength and Rigidity, General Requirements for	Maximum gross weight for taxiing and take-off for landbased and carrier-based aircraft; maximum weights for arrested landings; catapult accessories requirements.	MIL-D-8708
Second Tier			
MIL-A-8863	Airplane Strength and Rigidity, Ground Loads for Navy Acquired Airplanes	Landing and ground handling loads.	MIL-A-8860
The remaining second tier references, tiered to MIL-A-8860, are for guidance and information.			
Third Tier			
All third tier references, tiered to MIL-A-8860, are for guidance and information.			

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (35 of 96 Documents)			
MIL-A-8863	Airplane Strength and Rigidity, Ground Loads for Navy Procured Aircraft	Nomenclature definition; critical gross weight requirements for catapult launches and arrested landings of both carrier- and land-based aircraft.	MIL-D-8708
Second Tier			
MIL-A-8860	Airplane Strength and Rigidity, General Requirements for	Design weights.	MIL-A-8863
MIL-STD-2066	Catapulting and Arresting Gear Forcing Functions for Aircraft Structural Design	Horizontal components of forces.	MIL-A-8863

The remaining second tier references, tiered to MIL-A-8863, are for guidance and information.

Third Tier

All third tier references, tiered to MIL-A-8863, are for guidance and information.

First Tier (36 of 96 Documents)			
MIL-A-8867	Airplane Strength and Rigidity, Ground Tests	Structural dynamic tests; limits for the landing gear servicing.	MIL-D-8708
Second Tier			
MIL-A-8868	Airplane Strength and Rigidity, Data and Reports	Loads and analysis data.	MIL-A-8867

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-A-8870	Airplane Strength and Rigidity, Vibration, Flutter and Divergence	Free play measurements for control surfaces and tabs.	MIL-A-8867

The remaining second tier references, tiered to MIL-A-8867, are for guidance and information.

Third Tier

All third tier references, tiered to MIL-A-8867, are for guidance and information.

First Tier (37 of 96 Documents)

MIL-A-8868	Airplane Strength and Rigidity Data and Reports	Report requirements for: Structural Dynamic Flight Demonstration; Structural Flight Test Anomaly and Failure; Gun Fire Vibration and Aeroacoustic Environment Measurements; Missile Vibration and Aeroacoustic Environment Measurements; and Catapult Aeroacoustic and Thermal Environment Summary.	MIL-D-8708

Second and Third Tiers

All second and third tier references, tiered to MIL-A-8868, are for guidance and information.

First Tier (38 of 96 Documents)

MIL-A-8870	Airplane Strength and Rigidity, Vibration, Flutter and Divergence	Vibration and aeroacoustical environment measurement test conditions; structural dynamic flight demonstration; aeroelastic stability flight test requirements; service life and free play measurements of control surfaces, tabs and wingfolds.	MIL-D-8708

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
Second Tier			
MIL-A-8867	Airplane Strength and Rigidity, Ground Tests	Test requirements for service life effects on control surfaces and tabs.	MIL-A-8870
The remaining second tier references, tiered to MIL-A-8870, are for guidance and information.			
Third Tier			
All third tier references, tiered to MIL-A-8870, are for guidance and information.			
First Tier (39 of 96 Documents)			
MIL-F-15160	Fuses, Instrument, Power and Telephone	Any QPL item.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-F-15160, are for guidance and information.			
First Tier (40 of 96 Documents)			
MIL-F-17874	Fuel Systems: Aircraft, Installation and Test of	Fuel dumping, feed and venting; fueling and defueling and fuel transfer system.	MIL-D-8708

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
Second Tier			
ASTM D910 (Replaces MIL-G-5572)	Standard Specification for Aviation Gasolines	Grades, general, material, requirements, and test methods sections.	MIL-F-17874
MIL-J-5624	Turbine Fuel, Aviation, Grades JP-4 and JP-5	Requirements and quality assurance gas turbine, ram jet and pulse jet engine aircraft only.	MIL-F-17874
MIL-F-18802	Fuel and Oil Lines, Aircraft Installation	Requirements.	MIL-F-17874
MIL-T-6396	Tanks, Aircraft Propulsion Fluid System, Internal, Removable, Non-Self Sealing	Requirements and quality assurance for integral tasks.	MIL-F-17874
MIL-T-5578	Tank, Fuel, Aircraft, Self-Sealing	Requirements and quality assurance.	MIL-F-17874
MIL-T-18847	Tanks, Fuel, Aircraft, Auxiliary External, Design and Installation of	Requirements and quality assurance.	MIL-F-17874
MIL-A-25896	Adapter, Pressure Fuel Servicing, Aircraft, Nominal 2-1/2 Inch Diameter	Any QPL item.	MIL-F-17874
MIL-N-5877	Nozzle, Pressure Fuel Servicing, Locking, Type D-1	Any QPL item.	MIL-F-17874

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-B-5087	Bonding, Electrical and Lightning Protection, for Aerospace Vehicles	Bonding of adapters.	MIL-F-17874
MIL-C-8605	Cap, Pressure Fuel Servicing	Any QPL item.	MIL-F-17874
MS29514	Flange, Adapter, Locking, Pressure Fuel Servicing	Entire document.	MIL-F-17874

All remaining second tier references, tiered to MIL-F-17874, are for guidance and information.

Third Tier

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes	Inspection level II; AQL of 2.5%.	MIL-J-5624
FED-STD-791	Lubricants, Liquid Fuels and Related Products; Methods of Testing	Method 9601, Inspection requirements.	MIL-J-5624
ASTM D3241	Standard Test Method for Thermal Oxidation Stability of Aviation Turbine Fuels	Procedures (thermal stability).	MIL-J-5624
MIL-I-27686	Inhibitor, Icing, Fuel Systems	Requirements and quality assurance.	MIL-J-5624
MIL-I-25017	Inhibitor, Corrosion/Lubricity Improve, Fuel Soluble (Metric)	Any QPL item.	MIL-J-5624
WW-T-700/4 (Replaces WW-T-787)	Tube, Aluminum Alloy, Drawn, Seamless	Aluminum alloy tubing for pressure fuel lines.	MIL-F-18802
WW-T-700/6 (Replaces WW-T-789)	Tube, aluminum Alloy, Drawn, Seamless	Aluminum alloy tubing for pressure fuel lines.	MIL-F-18802

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-T-8606	Tubing, Steel, Corrosion Resistant	CRES tubing requirements.	MIL-F-18802
MIL-H-8795	Hose Assemblies, Rubber Hydraulic Fuel and Oil Resistant	Flexible tubing requirements.	MIL-F-18802
TT-S-1732	Sealing Compound, Pipe Joint and Thread, Lead Free General Purpose	Antiseize compound requirements.	MIL-F-18802
MIL-B-5087	Bonding, Electrical and Lightning Protection for Aerospace Systems	Bonding requirements.	MIL-F-18802

The remaining third tier references, tiered to MIL-F-17874, are for guidance and information.

First Tier (41 of 96 Documents)

MIL-C-18244	Control and Stabilization Systems: Automatic Piloted Aircraft, General Specification for	Automatic flight control system compliance.	MIL-D-8708

Second Tier

MIL-F-8785		Minimum handling characteristics; longitudinal or directional lateral oscillatory mode dumping; maximum value for overpowering (3.3 and 3.4); maneuver limits and control forces.	MIL-C-18244
MIL-STD-203	Aircrew Station Controls and Displays Assignment, Location and Actuation of, for Fixed Wing Aircraft	Location of disengagement switches, knobs and controls.	
MIL-STD-810 (Replaces MIL-E-5272)	Environmental Test Methods and Engineering Guidelines	Environmental service conditions.	MIL-C-18244

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-STD-704	Aircraft Electric Power Characteristics	Power source conformance.	MIL-C-18244
MIL-E-5400	Electronic Equipment, Airborne, General Specification for	Design and installation of all electronic equipment in control systems; repairable/nonrepairable modules; materials, parts, processes, and non-standard parts approval.	MIL-C-18244
MIL-E-7080	Electronic Equipment, Aircraft, Selection and Installation of	Design and installation of all electronic equipment in control systems.	MIL-C-18244

The remaining second tier references, tiered to MIL-C-18244, are for guidance and information.

Third Tier

MIL-C-81774	Control Panel, Aircraft, General Specification for	Ease and accuracy of switch operation with operators gloved hand.	MIL-STD-203
MIL-S-3950	Switch, Toggle, General Specification for	Any QPL item.	MIL-STD-203
MIL-S-8805	Switches and Switch Assembly, Sensitive and Push, Snap Action, General Specification for	Any QPL item.	MIL-STD-203
MIL-S-22885	Switch, Push Button, Illuminated, General Specification for	Any QPL item.	MIL-STD-203
MIL-K-25049	Knob, Control, Equipment, Aircraft	Any QPL item.	MIL-STD-203
MIL-M-18012	Markings for Aircrew Station Displays Design, and Configuration of	Marking of controls, switches and knobs.	MIL-STD-203

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-STD-454	Standard General Requirements for Electronic Equipment	Requirements 22, 28, 42, 58 and 72 for parts selection, controls, tuning dials, switches, and parts substitution.	MIL-E-5400
MIL-C-6781	Control Panel, Aircraft Equipment, Rack or Console Mounted	Control panel conformance.	MIL-E-5400
MIL-STD-810 (Replaces MIL-E-5272)	Environmental Test Methods and Engineering Guidelines	Aeronautical explosion proof tests for electronic equipment.	MIL-E-7080

The remaining third tier references, tiered to MIL-C-18244, are for guidance and information.

First Tier (42 of 96 Documents)

MIL-L-18276	Lighting, Aircraft Interior, Installation of	Requirements and quality assurance of interior and exterior lighting systems.	MIL-D-8708

Second Tier

MIL-STD-411	Aircrew Station Signals	Visual aircrew station signals.	MIL-L-18276
MIL-C-25050	Colors, Aeronautical Lights and Lighting Equipment, General Requirement for	Red light requirements; white light requirements.	MIL-L-18276
MIL-STD-203	Aircrew Station Controls and Displays: Assignment, Location and Actuation of, for Fixed Wing Aircraft	Lighting fixture installation; visual aircrew signals; illumination.	MIL-L-18276
MIL-STD-250	Aircrew Station Controls and Displays for Rotary Wing Aircraft Illuminated	Lighting fixture installation; visual aircrew signals; illumination.	MIL-L-18276

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-L-25467	Lighting, Integral, Red, Aircraft Instrument, General Specification for	Primary lighting system; integrally lighted instruments.	MIL-L-18276
MS25027	Light Assembly, Cockpit, Fixed	Secondary instrument lighting systems.	MIL-L-18276
MIL-P-7788	Panels, Information, Integrally	Any QPL item.	MIL-L-18276
AN3037-8A	Light Assembly, Cabin Dome	Cockpit lights for emergency maintenance and flight.	MIL-L-18276
MIL-P-6781	Control Panel: Aircraft Equipment Rack or Console Mounted	Standard control panels for control of lights.	MIL-L-18276
All remaining second tier references, tiered to MIL-L-18276, are for guidance and information.			
Third Tier			
MIL-STD-1333	Aircrew Station Geometry for Military Aircraft	Design eye position.	MIL-STD-411
MIL-S-38039	Systems, Illuminated, Warning, Caution and Advisory, General Specification for	Signal assembly requirements.	MIL-STD-411
MIL-STD-783	Legends for Use in Aircrew Stations and on Airborne Systems	Legend presentation for signal lights if different from Tables I, II and III.	MIL-STD-411
MIL-C-25050	Color, Aeronautical Lights and Lighting Equipment, General Requirements for	Color requirements and testing for brightness.	MIL-STD-411

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-M-18012	Markings for Aircrew Station Displays Design and Configuration of	Signal lettering and number conformance.	MIL-STD-411
MIL-P-21563	Paint System, Fluorescent, for Aircraft Application	Any QPL item.	MIL-STD-411
MIL-L-27160	Lighting, Instrument, Integral, White, General Specification for	White illuminated.	MIL-STD-411
MIL-L-25467	Lighting, Integral, Red, Aircraft Instrument, General Specification for	Red illuminated.	MIL-STD-411
National Bureau of Standards 3215	Colors	Light transmission requirements.	MIL-C-25050 MIL-L-25467
MIL-C-14806	Coating, Reflection Reducing, for Instrument Cover Glass and Lighting Wedges	Reflection reducing coating for instrument cover glass and other transparent elements.	MIL-L-25467
MS27569	Lamp, Incandescent, Miniature Integral Lighting T-1-3/4 Size	Lamps for use when helium is used in the filling medium of the hermetically sealed instrument.	MIL-L-25467
MS27570-8515AS15	Lamp, Incandescent, Miniature Integral Lighting T-1-1/4 Size	Lamps for use when helium is used in the filling medium of the hermetically sealed instrument.	MIL-L-25467
MS27571-6809AS15	Lamp, Incandescent, Miniature Integral Lighting T-1 Size	Lamps for use when helium is used in the filling medium of the hermetically sealed instrument.	MIL-L-25467
MS25237-328AS10	Lamp, Incandescent, Single Contact Midget Flanged Base (T-1-3/4 Bulb)	Lamps for use when helium is not used or is a non-hermetically sealed case is used.	MIL-L-25467

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MS24367-715AS15	Lamp, Incandescent, Miniature Integral Lighting	Lamps for use when helium is not used or is a non-hermetically sealed case is used.	MIL-L-25467
MS24515-718AS15	Lamp, Sub-Miniature	Lamps for use when helium is not used or is a non-hermetically sealed case is used.	MIL-L-25467
MIL-C-25050	Colors, Aeronautical Lights and Lighting Equipment, General Requirements for	All light must meet aviation red requirements.	MIL-L-25467
MIL-C-81774	Control Panel, Aircraft, General Requirements for	Brightness range for knob positions and instrument face lettering.	MIL-L-25467
MIL-L-27160	Lighting, Instrument, Integral, White, General Specification for	Cover glass color, white, without lamp.	MS25027
MIL-L-85762		Cover glass color, anvis green "A".	MS25027
MIL-L-6723	Light, Aircraft, General Specification for	Any QPL item.	MS25027 AN3037
MIL-P-7788	Panels, Information, Integrally Illuminated	Any QPL item.	MIL-C-6781
MIL-L-21095	Light, Aircraft, Emergency (Inertia Actuated, for Fixed Wing Aircraft)	Emergency exit lighting.	MIL-C-6781

All remaining third tier references, tiered to MIL-L-18276, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (43 of 96 Documents)			
MIL-H-18325	Heating and Ventilating Systems, Aircraft: General Specification for	Carbon monoxide, fuel vapor concentration, and other irritable contaminant limits requirements.	MIL-D-8708
Second Tier			
MIL-C-18591(1)	Carbon Monoxide, Elimination, Requirements for	Lower explosive limit of the mixture for gases contaminated with carbon monoxide.	MIL-H-18325
MIL-I-8670	Installation of Fixed Guns and Associated Equipment in Naval Aircraft	Fixed gun installation gun gas elimination.	MIL-H-18325
MIL-I-8673(2)	Installation and Test of Aircraft Flexible Weapons Systems	Flexible weapons system gun gas elimination.	MIL-H-18325

All remaining second tier references, tiered to MIL-H-18325, are for guidance and information.

(1) This document has been canceled and superseded by MIL-STD-800, which has been canceled with no superseding document.
(2) MIL-I-8673 is canceled with no superseding document.

Third Tier

All third tier references, tiered to MIL-H-18325, are for guidance and information.

First Tier (44 of 96 Documents)			
MIL-S-18471	System, Aircrew Automated Escape, Ejection Seat Type, General Specification for	Ejection clearances, design and placement of escape system controls, manual egress and underwater ejection escape performance, automated escape.	MIL-D-8708

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
Second Tier			
MIL-STD-1472	Human Engineering Design	Escape system control placement.	MIL-S-18471
MIL-C-7905	Cylinder, Compressed Gas, Non-Shatterable	Any QPL item.	MIL-S-18471
MIL-S-81018	Survival Kit Container, Aircraft Seat, With Oxygen, General Specification for	Any QPL item.	MIL-S-18471
MIL-C-7958	Control, Push-Pull, Flexible and Rigid	Any QPL item.	MIL-S-18471
MIL-STD-1333	Aircrew Station Geometry for Military Aircraft	Ejection clearances.	MIL-S-18471
MIL-M-8650	Mockups, Aircraft, General Specification for	Ejection clearance mock-up.	MIL-S-18471

All remaining second tier references, tiered to MIL-S-18471, are for guidance and information.

Third Tier			
MIL-A-23121	Aircrew Environmental, Escape and Survival Cockpit Capsule System; General Specification for	Escape capsule requirements.	MIL-STD-1472
MIL-M-8650/2	Aircrew Systems, Mockup Inspection Check-Off List	Mockup requirements.	MIL-M-8650

All remaining third tier references, tiered to MIL-S-18471, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (45 of 96 Documents)			
MIL-T-18606	Test Procedures for Aircraft Environmental Systems	Measurement of temperatures; test procedures (requirements and quality assurance) for cockpit and cabin pressurizing, air conditioning and defogging systems and for cockpit and cabin nonpressurizing heating, ventilating systems.	MIL-D-8708
Second Tier			
MIL-T-5842	Transparent Areas on Aircraft Surfaces (Windshields and Canopies), Rain Removing and Washing Systems for Defrosting, Defogging, Deicing, General Specification for	Design atmospheric conditions for flight testing of defogging systems.	MIL-T-18606

The remaining second tier references, tiered to MIL-T-18606, are for guidance and information.

Third Tier			
MIL-STD-210	Climatic Information to Determine Design and Test Requirements for Military Systems and Equipment	Ambient atmosphere conditions.	MIL-T-5842

The remaining third tier references, tiered to MIL-T-18606, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (46 of 96 Documents)			
MIL-T-18607	Thermal Anti-Icing Equipment, Wing and Empennage	Thermal anti-icing system design, installation and performance.	MIL-D-8708
Second Tier			
AN9500(1)	Engines; General Specification for Aircraft, Reciprocating	Exhaust back pressure requirements with heat exchangers installed.	MIL-T-18607
MIL-H-5484	Heater, Aircraft, Combustion Type	Combustion heater requirements.	MIL-T-18607
MS28741 (Replaces AN5264)	Hose Assembly, Detachable End Fitting, Medium Pressure	Hose assembly fuel line.	MIL-T-18607
WW-T-700/4 (Replaces WW-T-787)	Tube, Aluminum Alloy, Drawn, Seamless	Requirements and quality assurance.	MIL-T-18607
MIL-W-5088	Wiring, Aerospace Vehicle	Electrical system installation.	MIL-T-18607
MIL-B-5087	Bonding, Electrical, and Lightning Protection, for Aerospace Systems	Electrical bonding with emphasis on thermal expansion provisions.	MIL-T-18607
MIL-STD-810 (Replaces MIL-E-5272)	Environmental Test Methods and Engineering Guidelines	Required environmental tests.	MIL-T-18607

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-C-5015	Connector, Electrical, Circular Threaded, AN Type, General Specification for	Any QPL item.	MIL-T-18607
MIL-E-7080	Electric Equipment, Aircraft, Selection and Installation of	Installation of electrical systems.	MIL-T-18607

The remaining second tier references, tiered to MIL-T-18607, are for guidance and information.

(1) AN9500 is canceled with no superseding document.

Third Tier

MIL-H-8795	Hose Assembly, Rubber, Hydraulic Fuel and Oil Resistant	Use, operating pressure and age control of hose assembly.	MS28741
MS25274	Cap, Electrical (Wire End, Crimp Style, Type II, Class 1)	Cap for undesignated wire end.	MIL-W-5088
MIL-E-6051	Electromagnetic Compatibility Requirements, System	Routing of wiring, including RF and antenna cables, to minimize electromagnetic interference.	MIL-W-5088
MIL-C-7762	Compass, Installation of	Maximum allowable compass deviation.	MIL-W-5088
MIL-L-6806	Lacquer, Clear, Aluminum Clad Aluminum Alloy Surfaces	Clear lacquer to be used for easier future bonding inspections.	MIL-B-5087
MIL-STD-810 (Replaces MIL-E-5272)	Environmental Test Methods and Engineering Guidelines	Explosive proof tests.	MIL-E-7080
MS90298	Connector, Receptacle, Electric Connector	Fuel nozzle grounding receptacles.	MIL-E-7080

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MS33645 (Replaces AND10439)	Receptacle, Grounding, Installation of	Fuel nozzle installation.	MIL-E-7080
MIL-B-5087	Bonding, Electrical, and Lightning Protection, for Aerospace Systems	Electrical bonding.	MIL-E-7080
MIL-E-6051	Electromagnetic Compatibility Requirements, System	Electrical equipment installation conformance.	MIL-E-7080
MIL-I-6181	Interference Control Requirements, Aircraft Equipment	Radio interference reduction.	MIL-E-7080
MIL-F-15733	Filters and Capacitors, Radio Frequency Interference, General Specification for	Any QPL item.	MIL-E-7080
MIL-C-7762	Compass, Installation of	Maximum requirements for compass deviations.	MIL-E-7080
MS33540	Safety Wiring and Cotter Pinning, General Practices for	Safety wiring practice.	MIL-E-7080
MIL-W-5088	Wiring Aerospace Vehicle	Installation of wires.	MIL-E-7080
AND10441(2)	Battery Installation	Battery installation requirements.	MIL-E-7080
MS33630	Switch, Toggle, Installation of	Installation requirements.	MIL-E-7080
MS33590	Circuit Breaker Installation	Entire document.	MIL-E-7080
QQ-S-763	Steel Bar Wire, Shape and Forgings, Corrosion Resisting	Class 321.	MIL-H-5484

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-STD-810 (Replaces) MIL-E-5272)	Environmental Test Methods and Engineering Guidelines	Method 514 (Vibration); Method 511 (Explosion); Method 507 (Humidity); Method 508 (Fungus); Method 509 (Salt Spray) and Method 510 (Sand and Dust).	MIL-H-5484
MIL-STD-704	Aircraft Electric Power Characteristics	Category B.	MIL-H-5484
MIL-I-6181	Interference Control Requirements Aircraft Equipment	Radio interference requirements.	MIL-H-5484
MIL-C-5015	Connectors, Electrical, Circular Threaded, General Specification for	Any QPL item.	MIL-H-5484
MIL-A-8625	Anodic Coatings for Aluminum and Aluminum Alloys	Anodizing requirements for aluminum parts except for electrical receptacles.	MIL-H-5484
QQ-P-416	Plating, Cadmium (Electrodeposited)	Requirements.	MIL-H-5484
MIL-G-5572	Gasoline, Aviation, Grades 80/87, 100/130, 115/145	Grade 115/145.	MIL-H-5484
MIL-J-5624	Jet Fuel, Grades JP-4 and JP-5	Grade JP-4/JP-5.	MIL-H-5484
MIL-H-18325	Heating and Ventilating Systems, Aircraft: General Specification for	Flight testing requirements.	MIL-H-5484

(2) AND10441 has been canceled with no superseding document.

The remaining third tier references, tiered to MIL-T-18607, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (47 of 96 Documents)			
MIL-E-18927	Environmental Control Systems, Aircraft, General Specification for	Requirements for carbon monoxide contamination; aircraft pressurization; defogging; adequate cooling under all conditions.	MIL-D-8708
Second Tier			
MIL-STD-210	Climatic Information to Determine Design and Test Requirements for Military Systems	Ambient atmospheric conditions.	MIL-E-18927
MIL-STD-454	Standard General Requirements for Electronic Equipment	Requirement 52, Thermal Design.	MIL-E-18927
MIL-T-23103	Thermal Performance Evaluation, Airborne Electronic Equipment and Systems, General Requirements for	Steady state thermal performance limit for cooled avionic equipment.	MIL-E-18927
MIL-E-7080	Electronic Equipment, Aircraft, Selection and Installation of	Electrical equipment cooling requirements.	MIL-E-18927
MIL-STD-800(1)	Procedure for Carbon Monoxide Detection and Control in Aircraft	Maximum allowable carbon monoxide limits.	MIL-E-18927
MS16052	Air Inlet, Combat Aircraft, Ground Cooling	Entire document.	MIL-E-18927
MS33561	Connection, Aircraft Ground Air Conditioning, 5 Inch, Minimum Requirements	Entire document.	MIL-E-18927
MS33562	Connection, Aircraft Ground Air Conditioning, 8 Inch, Minimum Requirements	Entire document.	MIL-E-18927

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-T-18606	Test Procedures for Aircraft Cabin Pressurizing and Air Conditioning Systems	Requirements and quality assurance.	MIL-E-18927

(1) MIL-STD-800 has been canceled with no superseding document.

All remaining second tier references, tiered to MIL-E-18927, are for guidance and information.

Third Tier

MIL-T-5842	Transparent Areas on Aircraft Surfaces (Windshields and Canopies), Rain Removing and Washing Systems for, Defrosting, Deicing, Defogging, General Specification for	Defogging system testing.	MIL-T-18606
MIL-STD-210 (Replaces ANA BULL 421)	Climatic Information to Determine Design Requirements for Military Systems and Equipment	Critical design temperatures for air conditioning.	MIL-T-18606
F-F-300	Filter, Air Conditioning: Viscous Impingement and Dry Types, Cleanable	Requirements and quality assurance.	MIL-STD-454
MIL-F-16552	Filter, Air Environmental Control System, Cleanable Impingement (High Velocity Type)	Any QPL item.	MIL-STD-454
MIL-B-23071	Blower, Miniature for Cooling, Electric Equipment, General Specification for	Any QPL item.	MIL-STD-454

The remaining third tier references, tiered to MIL-E-18927, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (48 of 96 Documents)			
MIL-D-19326	Design and Installation of Liquid Oxygen Systems in Aircraft, General Specification for	Requirements and quality assurance.	MIL-D-8708
Second Tier			
MIL-C-25969	Capsule, Emergency Escape Systems, General Specification for	Any QPL item.	MIL-D-19326
MIL-A-23121	Aircrew Environmental Escape and Survival Cockpit Capsule System; General Specification for	Pressurization and oxygen for capsule systems.	MIL-D-19326
MIL-O-27335	Oxygen System, Survival Container and Oxygen Kit, General Spec for	Seat or pan back pack emergency oxygen system requirements.	MIL-D-19326
MIL-S-81018	Survival Kit Container, Aircraft Seat, With Oxygen, General Specification for	Any QPL item.	MIL-D-19326
MIL-I-81387	Indicator, Liquid Oxygen Quantity	Any QPL item.	MIL-D-19326
MIL-I-25645	Indicator, Liquid Oxygen Quantity, Capacitance Type, General Spec for	Requirements.	MIL-D-19326
MIL-I-81388	Indicator, Repeaters, Liquid Oxygen Quantity	Any QPL item.	MIL-D-19326
MIL-C-19803	Converter, Liquid Oxygen, IOL, GCU-24A	Any QPL item.	MIL-D-19326

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-C-19328	Converter, Liquid Oxygen, 5L, MBA-5A	Any QPL item.	MIL-D-19326
MIL-C-25666		Requirements.	MIL-D-19326
MS90341	Mounting Bracket, Configuration, Mating Portion for 5 and 10 Liter Oxygen Converters	Converter bracket configuration.	MIL-D-19326
MIL-D-26392	Dummy Converter, Liquid Oxygen Indicator System, 10 Liter, CRU-23/A	Requirements.	MIL-D-19326
MIL-D-26393	Dummy Converter, Liquid Oxygen Indicator System, 25 Liter, CRU-24/A	Requirements.	MIL-D-19326
MIL-S-8805/3	Switch, Push, 10 Amperes and Low Level, Dusttight	Any QPL item.	MIL-D-19326
MIL-R-25410	Regulators, Oxygen, Diluter-Demand, Automatic Pressure-Breathing	Requirements automatic diluter and oxygen regulator.	MIL-D-19326
MIL-W-5088	Wiring, Aerospace Vehicle	External wiring.	MIL-D-19326
MIL-E-5400	Electronic Equipment, Aerospace, General Specification for	Cabling and connectors.	MIL-D-19326
MIL-R-83178	Regulator, Oxygen, Diluter-Demand, Automatic-Pressure-Breathing, General Specification for	Any QPL item.	MIL-D-19326
MIL-STD-203	Aircrew Station Controls and Displays Assignment, Location, and Actuation of, for Fixed Wing Aircraft	Location of panel mounted regulator.	MIL-D-19326

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-V-9050	Valves, Oxygen, Pressure Relief, Aircraft	Any QPL item.	MIL-D-19326
MS22068 (-1, -2, -7, -8)	Coupling Assemblies, Quick Disconnect Aircraft Liquid Oxygen Systems	Requirements.	MIL-D-19326
MIL-V-25962	Fitting End, Standard Dimensions for Flared Tube Connection and Gasket Seal	Requirements for use with a permanently installed converter.	MIL-D-19326
MS33656	Cap Assembly, Pressure Seal Flared Tube Fitting	Requirements.	MIL-D-19326
AN929-5	Cap Assembly, Pressure Seal, Flared, Tube Fitting	Cap with chain for use over the drain valve.	MIL-D-19326
MIL-V-25513	Valve, Check, for 300 PSI Liquid Oxygen Converter System, Type MH-1	Requirements for use with more than one installed converter.	MIL-D-19326
MIL-V-7908	Valves, Check, Aircraft Low Pressure Oxygen Systems	Requirements.	MIL-D-19326
MIL-H-22343	Hose Assemblies, Metal, Liquid Oxygen	Requirements to -65°C.	MIL-D-19326
MIL-H-26626	Hose Assembly Non-Metallic Tetrafluoroethylene, Oxygen	Requirements for flexibility to -65°C.	MIL-D-19326
AMS 4071	Aluminum Alloy Tubing, Hydraulic, Seamless, Drawn, Round 2-5Mg-0.25 Cr (5052-0) Annealed	Aluminum alloy tubing.	MIL-D-19326
MIL-T-8506	Tubing, Steel, Corrosion Resistant (304) Annealed, Seamless and Welded	Requirements for 304 steel.	MIL-D-19326
AND 10104	Tubing, Steel, Corrosion-Resistant, Round, Standard Dimensions for	Requirements.	MIL-D-19326

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-B-5087	Bonding, Electrical and Lightning Protection, for Aerospace Systems	Requirement for tube bonding.	MIL-D-19326
MS33583	Tubing End, Double Flare, Standard Dimensions for	Requirements.	MIL-D-19326
MS33584	Tubing End, Standard Dimensions for Flared	Requirements.	MIL-D-19326
MS33611	Tubing, Bend Radii	Maximum bend radius.	MIL-D-19326
44A25450	Sleeve, Oxygen Coupling	Requirements, oxygen coupling.	MIL-D-19326
MIL-T-27730	Tape, Antiseize, Tetrafluoroethylene, with Dispenser	Requirements and quality assurance.	MIL-D-19326
MIL-H-81581/5	Hose Assemblies, Breathing Oxygen, Low Pressure, Connector to Regulator	Any QPL item.	MIL-D-19326
MS22059	Oxygen System, Portable, 250 Cu In., High Pressure Aircraft	Requirements.	MIL-D-19326
MS22061	Oxygen System, Portable, 96 Cu In., High Pressure Aircraft	Requirements.	MIL-D-19326
60D3570	Cylinder and Regulator, Breathing Oxygen, Portable A/U26S-3, Assembly of	Requirements w/o refilling.	MIL-D-19326
53C3794	Cylinder and Regulator, Breathing Oxygen, Portable	Requirements with refilling.	MIL-D-19326
53D3970	Mask-Cylinder-Regulator, Oxygen, Portable, Aircraft, Firefighters	Requirements with refilling.	MIL-D-19326

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MS22032	Recharger Assembly, Portable Oxygen	Requirements.	MIL-D-19326
46A16236	Clip, Recharger Low Pressure Oxygen System	Requirements for valve end clip.	MIL-D-19326
MIL-T-81553	Regulator, Chest Mounted, 100 Percent Oxygen, Positive Pressure, CRU-79/P	Requirements.	MIL-D-19326
MIL-G-27617	Grease, Aircraft and Instrument, Fuel and Oxidizer Resistant	Lubricant requirements.	MIL-D-19326
MIL-O-27210	Oxygen, Aviator's Breathing, Liquid and Gas	Type I and II.	MIL-D-19326
MIL-T-38170	Tank, Mobile Storage, Liquid Oxygen, TMU-27/M	Requirements and quality assurance.	MIL-D-19326
MIL-T-26069	Trailer, Compressed Gas Cylinder, AF-M32R-3, High Pressure, 2 Wheel 6 Cylinder Capacity	Requirements and quality assurance.	MIL-D-19326
MIL-L-25567	Leak Detection Compound, Oxygen Systems	Leak test compound; leakage requirements.	MIL-D-19326

The remaining second tier references, tiered to MIL-D-19326, are for guidance and information.

Third Tier

AMS 5512	Steel Sheet, Strip and Plate, Corrosion and Heat Resistant	Corrosion and heat resistant steel.	MS90341
MIL-STD-454	Standard General Requirements for Electronic Equipment	Requirement 10, Electrical Connectors; Requirement 65, Cable, Multiconnector.	MIL-E-5400

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
ASA B46	Balancing Flexible Rotors, Procedures for	Flare sealing surface (RHR).	MS33583
QQ-S-698	Steel Sheet and Strip, Low Carbon	No. 3 temper steel (1/4 hard).	MS22059 MS22061
ASTM A853 (Replaces QQ-W-461)	Standard Specification for Wire, Carbon, for General Use	Procedures and calculations section.	MS22059 MS22061
ASTM A818 (Replaces QQ-W-461)	Wire, Carbon Steel, Coppered	Procedures and calculations.	MS22059 MS22061
ASTM A641 (Replaces QQ-W-461)	Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire	Procedures and calculations.	MS22059 MS22061
ASTM A809 (Replaces QQ-W-461)	Wire, Carbon Steel, Aluminum Coated (Aluminized)	Procedures and calculations.	MS22059 MS22061
QQ-S-766	Steel Plates, Sheets and Strip, Corrosion Resisting	Requirements for CRES strip.	MS22059 MS22061
MIL-T-5561	Tape and Webbing, Textile, Woven Reinforcing, Cotton	Type II.	MS22059 MS22061
V-T-295	Thread, Nylon	Size E, Type II, Class 1 or 2.	MS22059 MS22061
QQ-B-626	Brass, Leaded and Nonleaded: Rod, Shapes, Forgings and Flat Products With Finished Edges (Bar and Strip)	Composition 360 or 377.	MS22059 MS22061

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
TT-P-1757	Primer Coating, Zinc Chromate, Low Moisture Sensitivity	Finish requirements.	MS22059 MS22061
TT-E-516	Enamel, Lusterless, Quick Drying, Styrenated Alkyd Type	Any QPL item.	MS22059 MS22061
FED-STD-595	Colors	Color 37038.	MS22059 MS22061
QQ-P-416	Plating, Cadmium (Electrodeposited)	Type I, Class 1.	MS22059 MS22061
QQ-B-654	Brazing Alloys, Silver	Class BAg-5.	MS22059 MS22061
MIL-H-6875	Heat Treatment of Steel, Process for	Temperature control requirements.	MIL-T-8506
MS33584	Tubing End, Standard Dimensions for Flared	Minimum dimensional requirements.	MIL-T-8506
QQ-P-35	Passivation Treatments for Corrosion Resisting Steel	Requirements.	MIL-T-8506
ASTM E8 (Replaces FED-STD-151, Method 211)	Metallic Materials, Tension Testing of	Procedures and calculations.	MIL-T-8506
MS21211	Valves, Check, Aircraft, Low Pressure Oxygen	Entire document.	MIL-V-7908

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-T-27730	Tape, Antiseize, Polytetrafluoroethylene With Dispenser	Requirements and quality assurance.	MIL-V-7908
MIL-C-81302	Cleaning Compound, Solvent, Trichlorotrifluroethane	Requirements and quality assurance.	MIL-V-7908
MIL-C-81533	Trichloroethane, 1,1,1 (Methyl Chloroform) Inhibited, Vapor Degreasing	Requirements and quality assurance.	MIL-V-7908
MIL-A-8625	Anodic Coatings for Aluminum and Aluminum Alloys	Requirements and quality assurance.	MIL-V-7908
MIL-C-81590	Cockpit Canopy System, Fixed Wing Single and Multiplace, Fighter Aircraft and Trainer Aircraft, General Specification for	Transparency construction design.	MIL-A-23121

The remaining third tier references, tiered to MIL-D-19326, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (49 of 96 Documents)			
MIL-A-19736	Air refueling Systems, General Specification for	Requirements and quality assurance.	MIL-D-8708
Second Tier			
MIL-F-7179	Finishes, coatings, and Sealants for the Protection of Aerospace Weapons Systems	Requirements and quality assurance for finishes.	MIL-A-19736
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys	Requirements and quality assurance.	MIL-A-19736
QQ-P-416	Plating, Cadmium (Electrodeposited)	Non-working steel surfaces and CRES.	MIL-A-19736
QQ-C-320	Chromium Plating, Electrodeposited	Class 2.	MIL-A-19736
MIL-H-8775	Hydraulic System Components, Aircraft and Missiles, General Specification for	Hydraulic system finish.	MIL-A-19736
MIL-STD-2175 (Replaces MIL-C-6021)	Castings, Classification and Inspection of	Class 1B.	MIL-A-19736
MIL-T-5624	Turbine Fuel, Aviation Grades JP-4, JP-5, and JP-5/JP-8 ST	Fuel requirements; JP-4 and JP-5.	MIL-A-19736
MS29513	Packing, Preformed, Hydrocarbon Fuel Resistant, "O" Ring	Dimensional requirements only.	MIL-A-19736

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-P-5315	Packing, Preformed, Hydrocarbon Fuel Resistant	Any QPL item.	MIL-A-19736
MIL-R-6855	Rubber, Synthetic Sheets, Strips, Molded or Extruded Shapes, General Specification for	Requirements and quality assurance.	MIL-A-19736
MIL-STD-810 (Replaces MIL-E-5272)	Environmental Procedures and Engineering Guidelines	Temperature, altitude, vibration, corrosion resistance, shock, humidity, shock.	MIL-A-19736
MIL-F-8615	Fuel System Components; General Specification for	Fuel resistance requirements.	MIL-A-19736
MIL-H-5440	Hydraulic Systems, Aircraft, Types I and II, Design and Installation Requirements for	Requirements (except for packing) and quality assurance for refueling.	MIL-A-19736
MIL-P-87210 (Replaces MIL-P-5518)	Pneumatic Power Systems, High Pressure	Requirements and quality assurance.	MIL-A-19736
MIL-E-7080	Electric Equipment, Aircraft Selection and Installation of	Air refueling system electrical equipment installation.	MIL-A-19736
MIL-S-4040	Solenoid, Electrical, General	Any QPL item.	MIL-A-19736
MIL-S-8805 (Replaces MIL-S-6744)	Switches and Switch Assemblies, Sensitive and Push (Snap Action), General Specification for	Any QPL item.	MIL-A-19736

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-R-6106	Relays, Electric, Aircraft, General Specification for	Any QPL item.	MIL-A-19736
MIL-T-7928	Terminals, Lug: Splices, Conductors; Crimp Style, Copper, General Specification for	Any QPL item.	MIL-A-19736
MIL-C-5015	Connectors, Electrical, AN Type	Any QPL item.	MIL-A-19736
MIL-C-26482	Connector, Electrical (Circular, Miniature, Quick Disconnect, Environment Resisting), Receptacles and Plugs, General Specification for	Any QPL item.	MIL-A-19736
MIL-B-5087	Bonding, Electrical and Lightning Protection, Aerospace Systems	Bonding to discourage build-up of static charge.	MIL-A-19736
MIL-F-17874	Fuel Systems; Aircraft Installation and Test of	Installation and test requirements; fuel flow rate; quality assurance.	MIL-A-19736
MIL-A-8591	Airborne Stores, Suspension Equipment and Aircraft - Store Interface (Carriage Phase); General Design Criteria for	Tanker external stores loads.	MIL-A-19736
MIL-A-8865	Airplane Strength and Rigidity, Miscellaneous Loads	Hose loads.	MIL-A-19736
MIL-T-6396	Tanks, Aircraft Propulsion Fluid System, Internal Removable, Non-Self-Sealing	Requirements for removable tanks.	MIL-A-19736
MIL-T-18847	Tanks, Fuel, Aircraft, Auxiliary External Design and Installation of	Requirements for external tanks.	MIL-A-19736

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-STD-704	Aircraft Electrical Power Characteristics	Category C.	MIL-A-19736
MIL-D-21625	Design and Evaluation of Cartridges for Cartridge Actuated Devices	Requirements and quality assurance.	MIL-A-19736
MIL-P-7962	Primer Coating, Cellulose - Nitrate Modified Alkyd Type, Corrosion - Inhibiting, Fast Drying	Primer requirements for hose reels.	MIL-A-19736
MIL-L-19537	Lacquer; Acrylic - Nitrocelluose, Gloss for (Aircraft use)	Lacquer requirements for hose reels.	MIL-A-19736
MIL-H-4495	Hose Assembly, Rubber, Aerial Refueling	Type I.	MIL-A-19736
MIL-C-25162	Coupling, Reception, Flight Pressure, Refueling Type MA-2	Any QPL item.	MIL-A-19736
MIL-M-18012	Markings for Aircrew Station Displays, Design and Configuration of	Control panel requirements.	MIL-A-19736
MIL-N-25161	Nozzle, Aerial Pressure, Refueling Type MA-2	Any QPL item.	MIL-A-19736
MIL-I-18802	Installation of Fuel and Oil Lines and Connections in Naval Aircraft	Installation requirements.	MIL-A-19736
MIL-L-6730	Lighting Equipment; Exterior Aircraft (General Specification for)	Probe light requirements.	MIL-A-19736

The remaining second tier references, tiered to MIL-A-19736, are for guidance and information.

Third Tier

MIL-F-18264	Finishes, Organic, Weapons Systems, Application and Color of	Requirements and quality assurance.	MIL-F-7179

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-S-5002	Surface Treatments and Inorganic Coatings for Metal Surfaces of Weapons Systems	Requirements and quality assurance except for resistance-welded faying surfaces.	MIL-F-7179
MIL-A-83377	Adhesive Bonding (Structural) for Aerospace and Other Systems, Requirements for	Adhesion requirements for faying surfaces.	MIL-F-7179
MIL-S-81733	Sealing and Coating Compound, Corrosion Resistant	Any QPL item.	MIL-F-7179
MIL-S-8802	Sealing Compound, Temperature-Resistant, Integral Fuel Tanks and Fuel Cell Cavities, High Adhesion	Any QPL item.	MIL-F-7179
MIL-S-83430	Sealing Compound, Integral Fuel Tank and Fuel Cell Cavities, Intermittent Use to 360°F	Requirements and quality assurance.	MIL-F-7179
MIL-C-5541	Chemical Conversion Coatings on Aluminum Alloys	Class 1A, brush application.	MIL-A-8625
ASTM B137	Standard Test Method for Measurements of Weight of Coating on Anodically Coated Aluminum	Test specimen and procedure sections.	MIL-A-8625
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes	Inspection level II; AQL of 1.5%.	MIL-A-8625
ASTM B244	Standard Test Method for Measurement of Thickness of Anodic Coatings on Aluminum and Other Nonconductive Coatings on Non-Magnetic Basis Metals	Apparatus, factor affecting measurement, procedures and accuracy sections.	MIL-A-8625

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
FED-STD-151	Metals, Test Methods	Method 520, Electronic Test for Local Coating Thickness.	MIL-A-8625
ASTM B117	Standard Method of Salt Spray (Fog) Testing	Apparatus, salt solution, conditions in chamber, period of test sections.	MIL-A-8625
ASTM G23	Standard Practice for Operating Light-Exposed Apparatus (Carbon Arc Type) With and Without Water for Exposure of Nonmetallic Materials	Apparatus, general procedures, Methods 1, 2 and 3 Sections.	MIL-A-8625
ASTM D2244	Standard Method for Calculation of Color Differences for Instrumentally Measured Color Coordinates	Summary of method and procedure sections.	MIL-A-8625
FED-STD-141	Paint, Varnish, Lacquer, and Related Materials; Methods for Testing of	Method 6192.	MIL-A-8625
MIL-I-25017	Inhibitor, Corrosion, Fuel Soluble	Any QPL item.	MIL-T-5624
MIL-I-27686	Inhibitor, Icing, Fuel System	Conformance of fuel system icing inhibitor; material requirements	MIL-T-5624 MIL-T-6396
ASTM D156	Standard Test Methods for Saybolt Color of Petroleum Products (Saybolt Chromometer Meter)	Procedure for refined light oils.	MIL-T-5624
ASTM D3242	Standard Test Method for Acidity in Aviation Turbine Fuel	Procedures.	MIL-T-5624

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
ASTM D1319	Standard Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Absorption	Materials, sampling and procedures.	MIL-T-5624
ASTM D822	Standard Practice for Operating Light and Water Exposure Apparatus (Carbon Arc Type) for Testing Paint and Related Coatings and Materials	Procedure, exposure and evaluation evaluation of results sections.	MIL-A-8625
ASTM A304 (Replaces QQ-S-624)	Standard Specification for Alloy Steel Bars Subject to End-Quench Hardenability Requirements	Manufacture, general requirements and chemical requirement sections.	QQ-C-320
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes	Inspection level 2, AQL of 1.5%. Inspection level 2, AQL of .65 and 1%.	QQ-C-320
ASTM B487	Standard Methods for Measurement of Metal and Oxide Coating Thickness by Microscopical Examinations of a Cross Section	Preparation of cross-sections and measurements sections.	QQ-C-320
ASTM B499	Standard Test Method for Measurement of Coating Thickness by the Magnetic Method: Non-Magnetic Coatings on Magnetic Basis Metals	Calibration of instruments and measuring procedures section.	QQ-C-320
ASTM B504	Standard Test Methods for Measurements of Thickness of Metallic Coatings by Coulometric Method	Calibration of instruments and procedures for making measurements sections.	QQ-C-320

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-STD-1312	Fastener Test Methods	Test 12.	QQ-C-320
ASTM B578	Standard Test Method for Micro-hardness of Electroplated Coatings	Vicker indicator with 100 gram load.	QQ-C-320
ANSI B46.1	Surface Texture (Surface Roughness, Waviness and Lag)	Roughness requirements.	MIL-H-8775
ASTM D2240	Standard Test Method for Rubber Property - Hardness	Conditioning and procedures sections.	MIL-R-6855
ASTM D412	Standard Test Methods for Rubber Properties in Tension	Calibration, Method A and Tables 1 and 2.	MIL-R-6855
ASTM D792	Standard Test Methods for Specific Gravity (Relative Density) and Density of Plastics by Displacement	Conditioning and Method A sections.	MIL-R-6855
ASTM D518	Standard Test Method for Rubber Deterioration - Surface Cracking	Method A.	MIL-R-6855
ASTM D1149	Standard Test Method for Rubber Deterioration - Surface Ozone Cracking in a Chamber	Test specimen and procedure sections.	MIL-R-6855
MIL-P-5425	Plastic Sheet, Acrylic, Heat Resistant	Any QPL item.	MIL-R-6855
TT-N-95	Naptha, Aliphatic	Requirements and quality assurance.	MIL-R-6855
ASTM D395	Standard Test Method for Rubber Property, Compression Set	Method A.	MIL-R-6855
ASTM D471	Standard Test Method for Rubber Property, Effect of Liquids	Test procedures, test liquids and changes in tensile strength, elongation and hardness sections.	MIL-R-6855

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
FED-STD-151	Metal, Test Methods	Metal inspection requirements for fuel resistance.	MIL-F-8615
MIL-STD-2175 (Replaces MIL-C-6021)	Castings, Classification and Inspection of	Requirements and quality assurance, inspection of.	MIL-F-8615
MIL-A-21180	Aluminum Alloy Castings, High Strength	Requirements and quality assurance.	MIL-F-8615
MIL-F-7190	Forging, Steel, for Aircraft and Special Ordnance Applications	Requirements and quality assurance.	MIL-F-8615
MIL-R-5315	Packing, Preforms, Hydrocarbon Fuel Resistant	Any QPL item.	MIL-F-8615
MIL-R-6855	Rubber, Synthetic Sheets, Strips, Molded or Extruded Shapes, General Specification for	Class 1.	MIL-F-8615
MIL-R-25988	Rubber, Flurosilicon Elastomer, Oil and Fuel Resistant, Sheet, Strips, Molded Parts, and Extruded Shapes	Requirements and quality assurance.	MIL-F-8615
MIL-R-83248	Rubber, Flurocarbon Elastomer, High Temperature, Fluid and Compression Set Resistant	Requirements and quality assurance.	MIL-F-8615
QQ-P-416	Plating, Cadmium (Electrodeposited)	Class 2, Type II.	MIL-F-8615
QQ-C-320	Chromium Plating, Electrodeposited	Class 2.	MIL-F-88615
MS33558	Pointers, Dial, Standard Design of Aircraft Instrument	Letter design.	MIL-M-18012

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-STD-203	Aircrew Station Controls and Displays Assignment, Locations and Actuation of; for Fixed Wing Aircraft	Cockpit control and display relationship.	MIL-M-18012
MIL-STD-250	Aircrew Station Controls and Displays for Rotary Wing Aircraft	Cockpit control and display relationship.	MIL-M-18012
MIL-STD-411	Aircrew Station Signals	Control knob requirements.	MIL-M-18012
MS33549	Case, Instrument, 2-314 Dial With Sump, Standard Dimensions	Entire document.	MIL-T-6396
MS33786	Fitting, Installation, Flared Tube and Hose, Swivel	Entire document.	MIL-T-6396
MS29558 - MS29560	Fitting, O-Ring, Circular, Compression Type, Single Groove, Tank	Entire document.	MIL-T-6396
MS29562	Fitting, Attachment, Molded, Tank, Thru Hole, Flush, O-Ring	Entire document.	MIL-T-6396
MS33581	Fitting, O-Ring, General Features of Construction	Entire document.	MIL-T-6396
MS29568	Fitting, Attachment, Molded Tank, Flush	Entire document.	MIL-T-6396
MS20995	Wire, Safety or Lock	CRES requirements.	MIL-T-6396
MIL-N-25027	Nut, Self-Locking, 250°F, 450°F and 800°F	Self-locking feature requirements.	MIL-T-6396
MS33540	Safety Wiring and Cotter Pinning, General Practices for	Safety method section.	MIL-T-6396

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MS24665	Switch, Toggle, Positive Break, Miniature Toggle Sealed, Single Pole	Entire document.	MIL-T-6396
MIL-STD-810	Environmental Test Methods and Engineering Guidelines	Salt fog, Method 509 (steel parts only).	MIL-T-6396
ASTM B117	Standard Method of Salt Spray (Fog) Testing	Apparatus, factors affecting measurement, procedures and accuracy sections.	MIL-T-6396
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys	Requirements and quality assurance.	MIL-T-6396
MIL-C-5541	Chemical Conversion Coating on Aluminum and Aluminum Alloys	Requirements and quality assurance.	MIL-T-6396
MIL-P-8045	Plastic, Self-Sealing and Non-Self-Sealing Tank Backing Material	Type I, materials requirements.	MIL-T-6396
TT-S-735	Standard Test Fluids, Hydrocarbons	Types I and III.	MIL-T-6396
ASTM D381	Fuels by Jet Evaporation, Gum In	Use evaporation time of 45 minutes.	MIL-T-6396
FED-STD-601	Rubber, Stamping	Methods 4111, 4121 and 8011.	MIL-T-6396
FED-STD-191	Textile Test Methods	Method 5100.	MIL-T-6396
ANSI B46.1	Surface Texture (Surface Roughness, Waviness and Lay)	Surface roughness finishes.	MIL-H-8775

The remaining third tier references, tiered to MIL-A-19736, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (50 of 96 Documents)			
MIL-L-22589	Launching System, Nose Gear Type, Aircraft	Catapult accessory requirements, catapult spotting requirements.	MIL-D-8708
Second Tier			
607770		Launching system dimensional requirements.	MIL-L-22589
MIL-A-8860	Airplane Strength and Rigidity, General Specification for	Launching weights and center of gravity.	MIL-L-22589
MIL-A-8863	Airplane Strength and Rigidity, Ground Loads for Navy Acquired Airplanes	Loads and strength requirements.	MIL-L-22589
MIL-STD-203	Aircrew Station Controls and Displays; Assignment, Location and Actuation of, for Fixed Wing Aircraft	Location of controls for catapult accessories.	MIL-L-22589
MIL-STD-411	Aircrew Station Signals	Advisory light requirements for catapult accessories.	MIL-L-22589
MIL-T-81259	Tie-Downs, Aircraft Design, Requirements for	Holdback fitting restraint.	MIL-L-22589
MIL-B-85110		Requirements and quality assurance.	MIL-L-22589

The remaining second tier references, tiered to MIL-L-22589, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
Third Tier			
MIL-A-8860	Airplane Strength and Rigidity, General Requirements for	Design weights.	MIL-A-8863
MIL-C-81774	Control Panel, Aircraft, General Specification for	Design location of controls.	MIL-STD-203
MIL-STD-1333	Aircrew Station Geometry for Military Aircraft	Zone 1.	MIL-STD-203
The remaining third tier references, tiered to MIL-L-22589, are for guidance and information.			
First Tier (51 of 96 Documents)			
MIL-F-23447	Fire Warning Systems, Aircraft, Radiation Sensing Type, Test and Installation of	Ground and flight operation of the fire warning system.	MIL-D-8708
Second Tier			
MIL-E-5400	Electronic Equipment, Aerospace, General Specification for	Control amplifier and sensor internal wiring.	MIL-F-23447
MIL-STD-704	Aircraft Electric Power Characteristics	Transient voltage shall not result in a false alarm; power variation.	MIL-F-23447
MIL-STD-411	Aircrew Station Signals	Fire warning signal requirements; legend-type warning system with "FIRE" in red.	MIL-F-23447
MS25231-313	Lamps, Incandescent, Center Contact, Miniature Bayonet Base (T-3-1/4 Bulb)	Light signal lamp requirements for fire warning.	MIL-F-23447
MIL-C-26482	Connectors, Electric, Circular, Miniature, Quick Disconnect	Any QPL item.	MIL-F-23447

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-R-6106	Relay, Electric, Aerospace, General Specification for	Any QPL item.	MIL-F-23447
MIL-E-7080	Electric Equipment, Aircraft, Selection and Installation of	Installation of electrical and electronic components of the fire warning system.	MIL-F-23447
MIL-I-8700	Installation and Test of Electronic Equipment in Aircraft, General Specification for	Installation of electrical and electronic components of the fire warning system.	MIL-F-23447
MIL-W-5088	Wiring Aerospace Vehicle	Installation of fire warning system wiring.	MIL-F-23447
MIL-STD-810 (Replaces MIL-E-5272)	Environmental Test Methods and Engineering Guidelines	Environmental tests including: high and low temperature, high and low altitude, rate of climb, rain, vibration, salt spray, and fungus resistance.	MIL-F-23447
MIL-T-5624	Turbine Fuel, Aviation, Grades JP-4, JP-5 and JP-5/JP-8	JP-4 fuel used for flame tests.	MIL-F-23447
ASTM D910 (Replaces MIL-G-5572)	Standard Specification for Aviation Gasolines	Grade 100 octane gasoline.	MIL-F-23447
MIL-I-6181	Interference Control Requirements Aircraft Equipment	EMI requirements.	MIL-F-23447

All remaining second tier referenced, tiered to MIL-F-23447, are for guidance and information.

Third Tier

MIL-STD-454	Standard General Requirements for	Requirements 17 and 69 for printed wiring and internal wiring.	MIL-E-5400

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-C-25050	Colors, Aeronautical Lights and Lighting Equipment, General	Color and brightness of warning signals.	MIL-STD-411
MIL-STD-810 (Replaces MIL-E-5272)	Environmental Test Methods and Engineering Guidelines	Aeronautical explosion proof tests for electronic equipment.	MIL-E-7080
MIL-I-25017	Inhibitor, Corrosion, Fuel Soluble	Any QPL item.	MIL-J-5624
MIL-I-27686	Inhibitor, Icing, Fuel System	Conformance of fuel system icing inhibitor.	MIL-J-5624
ASTM D156	Petroleum Products, Saybolt Color of	Procedures and calculations.	MIL-J-5624
ASTM D3242	Standard Test Method for Acidity in Aviation Turbine Fuel	Acid number requirements.	MIL-J-5624
ASTM D1319	Hydrocarbon Types in Liquid Petroleum Products by Fluroescent Indicator Absorption	Procedures and calculations.	MIL-J-5624
ASTM D1323(1)		Weight percent of mercaptan sulfur.	MIL-J-5624
MIL-I-6051	Interference Limits and Methods of Measurements, Electrical and Electronic Installation in Airborne Weapons Systems and Associated Equipment	Limit requirements for air vehicles.	MIL-I-6181

The remaining third tier references, tiered to MIL-F-23447, are for guidance and information.

(1) ASTM D1323 is canceled with no superseding document.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (52 of 96 Documents)			
MIL-R-23761	Regulator, Voltage and Control Panel, Aircraft, Direct Current Generator, General Specification for	Any QPL item.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-R-23761, are for guidance and information.			
First Tier (53 of 96 Documents)			
MIL-C-23866	Control Set, Approach Power AN/ASN-54(V)	Requirements and quality assurance.	MIL-D-8708
Second Tier			
MIL-E-5400	Electronic Equipment, Aerospace, General Specification for	Environmental service conditions for Class 2 equipment.	MIL-C-23866
MIL-E-4682(1)	Electron, Tube and Transistors, Choice and Application of	Requirements and quality assurance.	MIL-C-23866
MIL-STD-415	Test Provisions for Electronic Systems and Associated Equipment, Design Criteria for	Requirements.	MIL-C-23866
MIL-W-5088	Wiring, Aerospace Vehicle	External wiring requirements (unshielded interconnection cabling).	MIL-C-23866
MIL-I-6181	Interference, Control Requirements, Aircraft Equipment	Radiated interference vulnerability.	MIL-C-23866
MIL-STD-704	Aircraft Electrical Power Requirements	Requirements.	MIL-C-23866

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-STD-785 (Replaces MIL-R-22256)	Reliability Program for Systems and Equipment Development and Production	Calculated failure and reliability data; Test level IV, Table V.	MIL-C-23866
MIL-STD-756	Reliability Modeling and Prediction	Calculated failure and reliability data.	MIL-C-23866
MIL-M-7793	Meter, Time Totalizing	Any QPL item.	MIL-C-23866
MIL-T-19229	Transmitter, Angle of Attack or Sideslip, Local	Any QPL item. for angle of attack transmitters.	MIL-C-23866
MIL-T-5422	Testing, Environmental, Airborne Electronic and Associated Equipment	Environmental testing requirements - temperature-altitude; vibration; shock; humidity; salt spray; explosion; sand-dust; fungus.	MIL-C-23866
MIL-STD-781 (Replaces MIL-R-23094)	Reliability Testing for Engineering Development, Qualification Production	Procedure I.	MIL-C-23866

The remaining second tier references, tiered to MIL-C-23866, are for guidance and information.

Third Tier

MIL-C-7078	Cable, Electric, Aerospace Vehicle, General Specification for	Cable requirements.	MIL-W-5088
MIL-C-27500	Cable, Electric, Shielded and Unshielded, Aerospace	Cable requirements.	MIL-W-5088
MIL-E-5400	Electronic Equipment, Aerospace, General Specification for	Class 2.	MIL-T-5422

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
ASTM D910 (Replaces MIL-G-5572)	Standard Specification for Aviation Gasolines	Grade 100/130.	MIL-T-5422
MIL-STD-1472	Human Engineering Design Criteria for Military Systems, Equipment and Facilities	Human engineering requirements for electronic systems.	MIL-STD-415

(1) MIL-E-4682 is cancelled with no superseding document.

First Tier (54 of 96 Documents)

MIL-E-24021	Electric Power Monitors, External Aircraft	Any QPL item.	MIL-D-8708

Second and Third Tiers

All second and third tier references, tiered to MIL-E-24021, are for guidance and information.

First Tier (55 of 96 Documents)

MIL-W-25140	Weight and Balance Control System (for Aircraft and Rotocraft)	Requirements for maximum aft and forward center of gravity for service loadings; weight and balance data.	MIL-D-8708

Second Tier

MIL-STD-881	Work Breakdown Structures for Defense Materiel Items	Work breakdown structure system requirements.	MIL-W-25140

The remaining second tier references, tiered to MIL-W-25140, are for guidance and information.

Third Tier

All third tier references, tiered to MIL-W-25140, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (56 of 96 Documents)			
MIL-P-26292	Pitot and Static Pressure Systems, Installation and Inspection of	Requirements and quality assurance.	MIL-D-8708
Second Tier			
MIL-P-83207(1)	Pitot-Static, Nose Boom, Compensated, General Requirements for	Performance requirements.	MIL-P-26292
MIL-P-83206(2)	Pitot-Static Tube, N-Shaped, Compensated, General Specification for	Performance requirements.	MIL-P-26292
MIL-M-7793	Meter, Time Totalizing	Any QPL item.	MIL-P-26292
WW-T-400/4	Tube, Aluminum Alloy, Drawn, Seamless	Tubing requirements.	MIL-P-26292
MS33611	Tube Bend Radii	Minimum bend radius.	MIL-P-26292
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys	Requirements and quality assurance.	MIL-P-26292
MIL-C-5541	Chemical Conversion Coatings	Requirements and quality assurance.	MIL-P-26292
MIL-T-8606	Tubing, Steel, Corrosion-Resistant (18-8 Stabilized and Extra Low Carbon)	Tubing requirements.	MIL-P-26292
MIL-STD-1247	Markings, Functions and Hazardous Designations of Hose, Pipe and Tube Lines for Aircraft Missile and Space Systems	Color requirements for pitot and static pressure lines.	MIL-P-26292
TT-S-1732 (Replaces TT-A-580)	Sealing Compound, Pipe Joint and Thread, Lead Free General Purpose	Requirements and quality assurance for material to be used on threaded parts.	MIL-P-26292

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-S-22473	Sealing, Locking, and Retaining Compounds (Single Component)	Requirements and quality assurance for use in high vibration applications.	MIL-P-26292
AN6270	Hose Assembly, Detachable Swivel Fitting, Low Pressure	Flexible hose assembly requirements.	MIL-P-26292
MIL-H-25579	Hose Assembly, Tetrafluoroethylene, High Temperature, Medium Pressure	Any QPL item.	MIL-P-26292

The remaining second tier references, tiered to MIL-P-26292, are for guidance and information.

Third Tier

MIL-C-5541	Chemical Conversion Coatings on Aluminum and Aluminum Alloys	Class 1A, brush applications.	MIL-A-8625
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes	Inspection level 2, AQL of 1.5%. Inspection level per Table II.	MIL-A-8625 MIL-S-22473
ASTM B137	Standard Test Method for Measurements of Weight of Coating on Anodically Coated Aluminum	Specimens and procedures.	MIL-A-8625
ASTM B244	Standard Test Method for Measurement of Thickness of Anodic Coatings on Aluminum and Other Nonconductive Coatings	Apparatus, factors affecting measurement, procedures and accuracy sections.	MIL-A-8625
FED-STD-151	Metals, Tests Methods	Method 520.	MIL-A-8625
ASTM B117 (Replaces Method 811 of FED-STD-151)	Standard Method of Salt Spray (Fog) Testing	Apparatus, salt solution, conditions in salt spray chamber, continuity and period of test and evaluation sections.	MIL-A-8625

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
ASTM G23	Standard Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials	Methods 1, 2 and 3.	MIL-A-8625
ASTM D822	Standard Practice for Operating Light and Water Exposure Apparatus (Carbon Arc Type) for Testing Paint and Related Coatings	Procedure, exposure and evaluation sections.	MIL-A-8625
ASTM D2244	Standard Method for Calculation of Color Differences for Instrumentally Measured Color Coordinates	Summary and procedure sections.	MIL-A-8625
FED-STD-141	Paint, Varnish, Lacquer and Related Materials; Methods for Testing of	Method 6192.	MIL-A-8625
FED-STD-595	Colors	Color nos: 15102, 14187, 13655, 12197, 11136, 10049, 16473 and 17038.	MIL-STD-1247
MIL-H-6875	Heat Treatment of Steels (Aerospace Practice, Process for)	Temperature control requirements.	MIL-T-8606
MIL-STD-753	Corrosion-Resistant Steel Parts: Sampling, Inspection and Testing for Surface Passivation	Method 102 or 103.	MIL-T-8606

(1) MIL-P-83207 is cancelled with no superseding document.
(2) MIL-P-83206 is cancelled with no superseding document.

The remaining third tier references, tiered to MIL-P-26292, are for guidance and information.

First Tier (57 of 96 Documents)

MIL-P-26366	Propeller Systems, Aircraft, General Specification for	Vibratory stress survey requirements (ground and flight tests).	MIL-D-8708

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
Second and Third Tiers			
All second and third tier references, tiered to MIL-P-26366, are for guidance and information.			
First Tier (58 of 96 Documents)			
MIL-T-81571	Thermal Protective Systems, Aircraft Cockpit, General Specification for	Operation of nuclear thermal radiation pilot or cockpit protective system.	MIL-D-8708
Second Tier			
MIL-F-7179	Finishes, Coatings, and Sealants for the Protection of Aerospace Vehicles Systems	Protection requirements for metals when placed in hostile environments (corrosion).	MIL-T-81571
FED-STD-595	Colors	Colors 37038, 36440, 17875 and 37875.	MIL-T-81571
FED-STD-141	Paint, Varnish, Lacquer and Related Materials, Methods for Testing of	Methods 6301 and 4061.	MIL-T-81571
ASTM D2240 (Replaces ASTM D676)	Rubber Property-Durometer Hardness	Hardness "A".	MIL-T-81571
ASTM D412	Rubber Properties in Tension	Methods A and B.	MIL-T-81571
ASTM D624	Rubber Property-Tear Resistance	Procedures and calculations.	MIL-T-81571
ASTM D573	Rubber-Deterioration in an Air Oven	Hardness "A," 70 hr test.	MIL-T-81571
ASTM D395	Rubber Property-Compression Set	Method B, % original elongation.	MIL-T-81571

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-S-18471	System Aircrew Automated Escape, Ejection Seat Type: General Specification for	Ejection seat clearance envelope.	MIL-T-81571
MIL-A-23121	Aircrew Environmental Escape and Survival Cockpit Capsule System; General Specification for	Emergency escape and survival mission of cockpit capsule.	MIL-T-81571
MIL-I-8500	Interchangeability and Replaceability of Component Parts for Aerospace Vehicles	Thermal protective system parts interchangeability requirements.	MIL-T-81571
MIL-C-8779	Color, Interior, Aircraft, Requirements for	Interior colors not previously defined.	MIL-T-81571
MIL-STD-2161 (Replaces MIL-C-18263)	Paint Schemes and Exterior Markings for U.S. Navy and Marine Corps Aircraft	Exterior colors not previously defined.	MIL-T-81571
MIL-A-8865	Airplane Strength and Rigidity Miscellaneous Loads	Open position loads (longitudinal/vertical).	MIL-T-81571
ACEL Report NAEC-ACEL-533	Anthropometry of Naval Aviators	Thermal protective system compatibility requirements for upper and lower percentiles.	MIL-T-81571

The remaining second tier references, tiered to MIL-T-81571, are for guidance and information.

Third Tier

ASTM D412	Rubber Properties in Tension	Methods A and B.	ASTM D575
MIL-C-81590	Cockpit Canopy System, Fixed Wing Single and Multiplace, Fighter Aircraft and Trainer Aircraft, General Specification for	Transparency construction design.	MIL-A-23121

All third tier references, tiered to MIL-T-81571, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (59 of 96 Documents)			
MIL-B-81757	Batteries and Cells, Storage, Nickel-Cadmium, Aircraft, General Specification for	Any QPL item.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-B-81757, are for guidance and information.			
First Tier (60 of 96 Documents)			
MIL-E-81910	Electrical Power Generating and Control Equipment, Aircraft, General Specification for	Requirements and quality assurance.	MIL-D-8708
Second Tier			
MIL-STD-810	Environmental Test Methods and Engineering Guidelines	Method 513, Procedure I/II, Acceleration; Method 510, Procedure I, Dust; Method 509, Procedure I, Salt Fog; Method 516, Procedure I/III, Shock; Method 508, Procedure I, Fungus.	MIL-E-81910
MIL-L-23699	Lubricating Oil, Aircraft, Turbine Engines Synthetic Base	Any QPL item.	MIL-E-81910
MIL-STD-462	Electromagnetic Interference Characteristics, Measurement of	Methods CE03 and RE02.	MIL-E-81910
MIL-STD-461	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference	Broadband conducted and radiated emission requirements for CE03 and RE02.	MIL-E-81910

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
The remaining second tier references, tiered to MIL-E-81910, are for guidance and information.			
Third Tier			
All third tier references, tiered to MIL-E-81910, are for guidance and information.			
First Tier (61 of 96 Documents)			
MIL-C-83413	Connectors and Assemblies, Electrical Aircraft Grounding, General Specification for	Any QPL item.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-C-83413, are for guidance and information.			
First Tier (62 of 96 Documents)			
MIL-B-83769	Batteries, Storage, Lead-Acid, General Specification for	Any QPL item.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-B-83769, are for guidance and information.			

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (63 of 96 Documents)			
DOD-C-85050	Chargers, Battery, Nickel-Cadmium, Aircraft, General Specification for	Any QPL item.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to DOD-C-85050, are for guidance and information.			
First Tier (64 of 96 Documents)			
MIL-I-8670	Installation of Fixed Guns and Associated Equipment in Naval Aircraft	Boresight retention.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-I-8670, are for guidance and information.			
First Tier (65 of 96 Documents)			
MIL-I-85071	Inverters, Aircraft, DC to AC, General Specification for	Any QPL item.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-I-85071, are for guidance and information.			
First Tier (66 of 96 Documents)			
DOD-B-85584	Battery Relay Control Unit, Aircraft	Any QPL item.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to DOD-B-85584, are for guidance and information.			

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (67 of 96 Documents)			
MIL-STD-454	Standard General Requirements for Electronic Equipment	Protection system requirements; Requirements 1 and 8.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-STD-454, are for guidance and information.			
First Tier (68 of 96 Documents)			
MIL-STD-2165	Testability Program for Electronic Systems and Equipments	Task 103 Testability Data Collection and Analysis Planning.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-STD-2165, are for guidance and information.			
First Tier (69 of 96 Documents)			
MIL-STD-704	Aircraft Electric Power Characteristics	Aircraft electrical power conformance via steady state and transient power characteristics (for voltage, frequency, etc.). Alternate and emergency power systems. Electric power minimum during ground time. Power limits exceeded (external power protection, relay control circuits, etc.).	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-STD-704, are for guidance and information.			

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (70 of 96 Documents)			
DOD-STD-2167	Defense System Software Development	General requirements, detailed requirements.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to DOD-STD-2167, are for guidance and information.			
First Tier (71 of 96 Documents)			
MIL-STD-810	Environmental Test Methods and Engineering Guidelines	Electrical system installation testing requirements (as specified in the applicable equipment specification).	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-STD-810, are for guidance and information.			
First Tier (72 of 96 Documents)			
MIL-STD-877	Antenna Subsystem, Airborne Criteria for Design and Location of	Requirements and quality assurance for installed antenna systems.	MIL-D-8708

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
Second Tier			
MIL-STD-454	Standard General Requirements for Electronic Equipment	Requirement 1 (Safety Design); Requirement 7 (Interchangeability); Requirement 9 (Workmanship).	MIL-STD-877
MIL-L-7808	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base	Any QPL item.	MIL-STD-877
MIL-H-5606	Hydraulic Fluid, Petroleum Base, Aircraft, Missile and Ordnance	Any QPL item.	MIL-STD-877
MIL-H-8446(1)	Hydraulic Fluid, Nonpetroleum Base, Aircraft	Nonpetroleum based hydraulic fluid.	MIL-STD-877
MIL-J-5624	Turbine Fuel, Aviation, Grades JP-4 and JP-5	Grade JP-4 jet fuel.	MIL-STD-877
TT-I-735	Isopropyl Alcohol	Requirements and quality assurance.	MIL-STD-877
O-E-760	Ethyl Alcohol (Ethanol); Denatured Alcohol; Proprietary Solvents and Special Industrial Solvents	Requirements and quality assurance.	MIL-STD-877

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
O-M-232	Methanol (Methyl Alcohol)	Requirements.	MIL-STD-877
MIL-B-5087	Bonding, Electrical, and Lightning Protection, for Aerospace Systems	Bonding for metallic elements which are part of or adjacent to the antenna subsystem.	MIL-STD-877
MIL-E-6051	Electrical-Electronic System Compatibility and Interference Control Requirements for Aeronautical Weapons Systems	Interference control for the design and location of antenna subsystems; the design shall minimize the need for IC devices.	MIL-STD-877
MIL-R-7705	Radomes General Specification for	Requirements for radomes and electromagnetic windows.	MIL-STD-877

The remaining second tier references, tiered to MIL-STD-877, are for guidance and information.

Third Tier

FED-STD-141	Paint, Varnish, Lacquer and Related Materials, Methods for Testing of	Method 1022 (Sampling and Inspections); Method 4261 (Appearance).	TT-I-735
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes	Level 1, AQL 2.5%. Level S-2, AQL 4%.	TT-I-735
FED-STD-791	Lubricants, Liquid Fuels, and Related Products; Methods of Testing	Method 3253 (Water Content).	TT-I-735
ASTM D1613	Acidity in Volatile Solvents and Chemical Intermediates Used in Varnish, Paint, Lacquer and Related Products	Reagents and procedure.	TT-I-735 O-E-760
ASTM D1078	Distillation Range of Volatile Organic Liquids	Safety and procedures.	TT-I-735

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
ASTM D891	Standard Test Methods for Specific Gravity, Apparent, of Liquid Industrial Chemicals	Method A.	TT-I-735
ASTM D1296	Odor of Volatile Solvents and Diluents	Procedure.	TT-I-735 O-M-232
ASTM D130 (Replaces ASTM D1616)	Standard Method for Detection of Copper Corrosion From Petroleum Products by the Copper Strip Tarnish Test	Corrosion standards.	TT-I-735
ASTM D1209	Color of Clear Liquids (Platinum-Cobalt Scale)	Platinum-cobalt reference standards and procedures.	O-E-760
ASTM D1353	Nonvolatile Matter in Volatile Solvents for Use in Paint, Varnish, Lacquer and Related Products	Safety and procedure.	O-E-760 O-M-232
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes	Level S-4.	O-M-232
ASTM D1193	Reagent Water	Reagents and requirements.	O-M-232
ASTM E346	Standard Methods for Analysis of Methanol	Procedures for % of acetone, acidity, carbonizables, color distillation range, ethanol, per maganate time, specific gravity, water.	O-M-232

The remaining third tier references, tiered to MIL-STD-877, are for guidance and information.

(1) This document has been canceled with no superseding documents.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (73 of 96 Documents)			
MIL-STD-882	System Safety Program Requirements	Critical hardware, software and procedure requirements; report format to be task 209.	MIL-D-8708
Second Tier			
There are no documents referenced to MIL-STD-882.			
First Tier (74 of 96 Documents)			
MIL-STD-1385	Preclusion of Ordnance Hazards in Electromagnetic Fields; General Requirements for	Requirements for avoiding hazards of electromagnetic radiation to ordnance.	MIL-D-8708
Second Tier			
MIL-I-23659	Initiators, Electric, General Design Specification for	Verification of EEDs having an MNFS rating 1A/1W to be in accordance with electrical characteristics section.	MIL-STD-1385
MIL-STD-1512	Electroexplosive Subsystems, Electronically Initiated Design, Requirements and Test Methods	Test Method 2003 for EEDs MNFS rating other than 1A/1W.	MIL-STD-1385
OD 30393		Method and techniques incorporated in designs.	MIL-STD-1385
The remaining second tier references, tiered to MIL-STD-1385, are for guidance and information.			
Third Tier			
MIL-STD-202	Test Methods for Electronic and Electrical Component Parts	Method 301, Dielectric Withstanding Voltage; Method 303, Bridge Continuity; Method 302, Test Condition B, Bridge Circuit Resistance.	MIL-I-23659
All third tier references, tiered to MIL-STD-1385, are for guidance and information.			

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (75 of 96 Documents)			
MIL-STD-1472	Human Engineering Design Criteria for Military Systems, Equipment and Facilities	Emergency egress system.	MIL-D-8708
Second Tier			
MIL-A-23121	Aircrew Environmental, Escape and Survival Cockpit Capsule System; General Specification for	Requirements for escape capsules.	MIL-STD-1472
The remaining second tier references, tiered to MIL-STD-1472, are for guidance and information.			
Third Tier			
MIL-C-81590	Cockpit Canopy System, Fixed Wing Single and Multiplace, Fighter, Attack and Trainer Aircraft, General Specification for	Transparency construction requirements.	MIL-A-23121
MIL-D-81514	Device, Restraint Harness, Take-Up Inertia Locking, Powered-Retracting: General Specification for	Shoulder restraint device requirements.	MIL-A-23121
The remaining third tier references, tiered to MIL-STD-1472, are for guidance and information.			
First Tier (76 of 96 Documents)			
MIL-STD-1757	Lightning Qualification Test Techniques for Aerospace Vehicles and Hardware	Appendix A.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-STD-1757, are for guidance and information.			

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (77 of 96 Documents)			
MIL-STD-1760	Aircraft/Store Electrical Interconnecting System	Armament control system installation demonstration.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-STD-1760, are for guidance and information.			
First Tier (78 of 96 Documents)			
MIL-STD-1795	Lightning Protection of Aerospace Vehicles and Hardware	Lightning protection program.	MIL-D-8708
Second Tier			
MIL-E-6051	Electromagnetic Compatibility Requirements, Systems	EMC Control Plan requirements, as applicable.	MIL-STD-1795
MIL-STD-1757	Lightning Qualification Test Techniques for Aerospace Vehicles and Hardware	Zone definitions.	MIL-STD-1795
The remaining second tier references, tiered to MIL-STD-1795, are for guidance and information.			
Third Tier			
All third tier references, tiered to MIL-STD-1795, are for guidance and information.			

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (79 of 96 Documents)			
DOD-STD-2169	High Altitude Electromagnetic Pulse Environment	NEMP environment requirements.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to DOD-STD-2169, are for guidance and information.			
First Tier (80 of 96 Documents)			
MIL-STD-1388-1	Logistic Support Analysis	Task 501.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-STD-1388-1, are for guidance and information.			
First Tier (81 of 96 Documents)			
MS90298	Connector, receptacle, Electric Connector	Grounding jack.	MIL-E-6051
Second Tier			
AN960	Washer, Flat	Al alloy untreated washer.	MS90298
MS25082	Nut, Plain, Hexagon, Electrical Thin	Brass oxide plated nut.	MS90298

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
QQ-B-613	Brass, Leaded and Nonleaded: Flat Products (Plate, Bar, Sheet, Strip)	Brass requirement.	MS90298
QQ-B-750	Bronze, Phosphor; Bar, Plate, Rod, Sheet, Strip, Flat Wire, and Structural and Special Shaped Sections	Composition A.	MS90298
QQ-P-416	Plating, Cadmium (Electrodeposited)	Type II, Class 2.	MS90298
MS3943	Connector, Plug and Cap Electric, Grounding	Test plug; insertion and removal forces.	MS90298
MIL-STD-105	Sampling Procedures and Inspections by Attributes	Sampling - visual and mechanical, insertion and withdrawal force, torque and life test.	MS90298

The remaining second tier references, tiered to MS90298, are for guidance and information.

Third Tier

QQ-A-250/5	Aluminum Alloy ALCLAD 2024, Plate and Sheet	Condition T3 or T4 aluminum alloy.	AN960
QQ-B-626	Brass, Leaded and Nonleaded: Rod Shapes, Forgings and Flat Products with Finished Edges	Brass requirement, Copper Alloy 360.	MS25082
MIL-F-495	Finish, Chemical, Black, for Copper	Black oxide coating.	MS25082
MIL-S-5002	Surface Treatments and Inorganic Coatings for Metal Surfaces of Weapons Systems	Steel cleaning requirements for cadmium plating.	QQ-P-416

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-S-7720	Steel, Carbon-Resisting (18-8) Bars, Wire and Forging Stock (Aircraft Quality)	CRES (Plug and cap).	MS3493

The remaining third tier references, tiered to MS90298, are for guidance and information.

First Tier (82 of 96 Documents)

MIL-HDBK-235-2	Electronic (Radiated) Environment Considerations for Design and Procurement of Electrical and Electronic Equipment, Subsystems and Systems, Part 2	External electromagnetic environments.	MIL-D-8708

Second and Third Tiers

All second and third tiers, tiered to MIL-HDBK-235-2, are for guidance and information.

First Tier (83 of 96 Documents)

AR-40 Inactive for New Design, effective 1 July 1979	All Weather Carrier Landing System Airborne Subsystem, General Requirements for	Requirements, quality assurance provisions.	MIL-D-8708

First Tier (84 of 96 Documents)

IRIG-STD-106	Range Commanders Council Telemetry Standards	Entire document.	MIL-D-8708

Second and Third Tiers

All second and third tier references, tiered to IRIG-STD-106, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (85 of 96 Documents)			
OPNAVINST 3070.1	Operations Security	Chapter II - OPSEC doctrine.	MIL-D-8708
First Tier (86 of 96 Documents)			
NAVAIRINST 3710.1	Contractor's Flight Operations	Entire NAVAIR INSTRUCTION.	MIL-D-8708
First Tier (87 of 96 Documents)			
MIL-A-18717	Arresting Hook Installations, Aircraft	Arresting loading requirements and quality assurance.	MIL-D-8708
Second Tier			
MIL-A-8860	Airplane Strength and Rigidity	Limits for the tail wheel load resulting from the hook locations; nose wheel load/envelope or arrested landings definition; installation strength requirements.	MIL-A-18717
MIL-B-8906	Bolt, Tensile, Steel, 220 KSI Ftu, 450°F, External Wrenching, Flanged Head	Any QPL item.	MIL-A-18717
MIL-N-8922	Nut, Self-Locking, Steel, 220 KSI Ftu 450°F	Any QPL item.	MIL-A-18717
MIL-S-5002	Surface Treatments and Inorganic Coatings for Metal Surfaces of Weapon Systems	Surface treatment requirements for metallic surfaces including bolts, nuts and washers.	MIL-A-18717
MIL-STD-203	Aircrew Station Controls and Displays: Assignment, Location and Actuation of, for Fixed Wing Aircraft	Location of arresting hook control in the cockpit.	MIL-A-18717

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-L-6730	Lighting Equipment; Exterior, Aircraft (General Requirements for)	Relationship of arresting hook control and angle of attack approach lights.	MIL-A-18717
SD-8706	General Specification for Design Examinations, Engineering, Aircraft Weapon Systems	Arresting hook installation drawing requirements.	MIL-A-18717
MIL-H-25194	Hook Point, Aircraft Arresting	Any QPL item.	MIL-A-18717
MIL-D-23003	Deck Covering Compound, Non-Slip, Lightweight	Any QPL item.	MIL-A-18717

All remaining second tier documents, referenced to MIL-A-18717, are for guidance and information.

Third Tier

MIL-A-8863	Airplane Strength and Rigidity Ground Loads for Navy Procured Airplanes	Loads for carrier-based land planes (arresting and catapulting loads).	MIL-D-8860
MIL-A-8865	Airplane Strength and Rigidity Miscellaneous Loads	Miscellaneous loading conditions including tail wheel and nose wheel loads.	MIL-D-8860
MIL-A-8866	Airplane Strength and Rigidity Reliability Requirements, Repeated Loads and Fatigue	Requirements for preventing of fatigue and repeated load damage.	MIL-D-8860
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys	Anodized coating for aluminum and aluminum alloys.	MIL-S-5002
MIL-C-5541	Chemical Conversion Coatings on Aluminum and Aluminum Alloys	Chemical treatment coating of aluminum and aluminum alloys.	MIL-S-5002

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-C-81706	Chemical Conversion Materials for Coating Aluminum and Aluminum Alloys	Class 1A treatment by Method B application.	MIL-S-5002
MIL-M-3171	Magnesium Alloy, Processes for Pretreatment and Prevention of Corrosion on	Surface treatment of magnesium alloys; Type I or VI process for touchup.	MIL-S-5002
MIL-M-45202	Magnesium Alloy, Anodic Treatment of	Anodic coating of magnesium alloys, specifically parts subjected to abrasion, erosion or wear.	MIL-S-5002
MIL-H-8810	Handles, Control, Aircraft	Control handle requirements with warning light on handle.	MIL-STD-203
MIL-S-3950	Switch, Toggle, General Specification for	Any QPL item.	MIL-STD-203
MIL-S-8805	Switches and Switch Assemblies, Sensitive and Push, Snap Action, General Specification for	Any QPL item.	MIL-STD-203
MIL-S-22885	Switch, Pushbutton, Illuminated, General Specification for	Any QPL item.	MIL-STD-203
MS25318	Light, Approach, 28V	Angle of attack approach lights in red, yellow and green.	MIL-L-6730
MIL-I-6868	Inspection Process, Magnetic Particle	Non-destruction inspections of arresting hook assembly.	MIL-L-6730

All remaining third tier documents, referenced to MIL-A-18717, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (88 of 96 Documents)			
MIL-B-85110	Bar, Repeatable Release Holdback Aircraft Launch, General Design Requirements for	Requirements for strength, service life and carrier suitability requirements.	MIL-D-8708
First Tier (89 of 96 Documents)			
MIL-STD-470	Maintainability Program Requirements (for Systems and Equipments)	Maintainability demonstration; data collection requirements.	MIL-D-8708
Second Tier			
MIL-STD-471	Maintainability Verification/ Demonstration/Evaluation	Incorporation and enforcement of maintainability requirements for subcontractor/vendor specifications; demonstration of maintainability requirement achievement.	MIL-STD-470
Third Tier			
All third tier references, tiered to MIL-STD-470, are for guidance and information.			
First Tier (90 of 96 Documents)			
MIL-E-85583	Electric Power Generating Channel, Variable Input Speed, Alternating Current, 400 Hz, Aircraft; General Specification for	Any QPL item.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-E-85583, are for guidance and information.			

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (91 of 96 Documents)			
MIL-STD-785	Reliability Program for Systems and Equipment Development and Production	Reliability demonstration; data collection requirements (5.3/5.4).	MIL-D-8708
Second Tier			
MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes	Sampling - visual and mechanical, insertion and withdrawal force, torque and life test.	MIL-STD-785
Second and Third Tiers			
The remaining second and third tier references, tiered to MIL-STD-785, are for guidance and information.			
First Tier (92 of 96 Documents)			
MIL-STD-471	Maintainability Verification/ Demonstration/Evaluation	Collection of maintainability data during all phases of testing and demonstration.	MIL-D-8708
Second and Third Tier			
All second and third tier references, tiered to MIL-STD-471, are for guidance and information.			

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (93 of 96 Documents)			
MIL-STD-1333	Aircrew Station Geometry for Military Aircraft	General requirements.	MIL-D-8708
Second Tier			
MIL-S-18471	System, Aircrew Automated Escape, Ejection Seat Type: General Specification for	Ejection seat design and seat components.	MIL-STD-1333
MIL-STD-1472	Human Engineering Design Criteria for Military Systems, Equipment, and Facilities	Anthropometry.	MIL-STD-1333
MIL-STD-203	Aircrew Station Controls and Displays, Assignment, Locations, and Actuation of; for Fixed Wing Aircraft	Reach zone requirements for controls; location and actuation of controls.	MIL-STD-1333
MIL-STD-250	Aircrew Station Controls and Displays for Rotary Wing Aircraft	Reach zone requirements for controls; location and actuation of controls.	MIL-STD-1333

The remaining second tier references, tiered to MIL-STD-1333, are for guidance and information.

Third Tier			
MIL-STD-1472	Human Engineering Design Criteria for Military Systems, Equipment and Facilities	Crew member accommodations.	MIL-S-18471

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
MIL-F-87242 (Replaces MIL-A-8064)	Flight Control System, General Specification for	Requirements except for lubrication and salt spray requirements.	MIL-S-18471
MIL-H-19089	Harnesses, Integrated Parachute	Torso restraint.	MIL-S-18471
MIL-I-23659	Initiators, Electrical, General Design Specification for	Requirements and quality assurance.	MIL-S-18471
MIL-STD-1385	Preclusion of Ordnance Hazards in Electromagnetic Fields; General Requirements for	Protection from electromagnetic radiation.	MIL-S-18471
MIL-P-6645	Parachutes, Personnel, General Specification for	Parachute requirements.	MIL-S-18471
MIL-C-81774	Control Panel, Aircraft, General Requirements	Requirements for location and actuation of controls.	MIL-STD-203 MIL-STD-250

The remaining third tier references, tiered to MIL-STD-1333, are for guidance and information.

First Tier (94 of 96 Documents)

NAVAIRINST 3710.9	Anthropometric Accommodation in Naval Aircraft	Contractor pilots anthropometric restrictions.	MIL-D-8708

Second Tier

All second and third tier references, tiered to NAVAIRINST 3710.9, are for guidance and information.

TABLE X. Required documents and corresponding applicability data (continued).

DOCUMENT NUMBER:	DOCUMENT TITLE:	APPLICABILITY:	REFERENCED BY:
First Tier (95 of 96 Documents)			
OPNAVINST 4790.2	Naval Aviation Maintenance Program	Guidance and information.	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to OPNAVINST 4790.2, are for guidance and information.			
First Tier (96 of 96 Documents)			
MIL-STD-461	Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference	Part 1 General requirements and Part 2 Equipment and systems installed abroad aircraft, including associated ground support equipment (Class A1)	MIL-D-8708
Second and Third Tiers			
All second and third tier references, tiered to MIL-STD-461, are for guidance and information.			

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Preparing activity:
Navy - AS
(Project 1510-N058)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER	2. DOCUMENT DATE (YYMMDD)
	MIL-D-8708C(AS)	12 August 1991

3. DOCUMENT TITLE
DEMONSTRATION: AIRCRAFT WEAPON SYSTEMS, GENERAL SPECIFICATION FOR

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)	b. ORGANIZATION	
c. ADDRESS *(Include Zip Code)*	d. TELEPHONE *(Include Area Code)* (1) Commercial (2) AUTOVON *(If applicable)*	7. DATE SUBMITTED (YYMMDD)

8. PREPARING ACTIVITY

a. NAME	b. TELEPHONE *(Include Area Code)* (1) Commercial	(2) AUTOVON
Commanding Officer NAEC (SESD) Code 53	(908) 323-1116	624-1116
c. ADDRESS *(Include Zip Code)* Lakehurst, NJ 08733-5100	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	