

MIL-B-5935B(USAF)

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Superseding

MIL-B-5935A(USAF)

8 September 1953

MILITARY SPECIFICATION
BOMBING NAVIGATIONAL SYSTEMS, MA SERIES
GENERAL SPECIFICATION FOR

1. SCOPE

1.1 This specification establishes the general requirements for MA Series Bombing Navigational Systems.

2. APPLICABLE DOCUMENT

2.1 The following specifications and publications, of the issue in effect on the date of invitation for bids, shall form a part of this specification:

SPECIFICATIONS**Military**

MIL-P-116	Preservation, Methods of
JAN-C-172	Cases and Mounting Bases, Electronic Aircraft
MIL-L-644	Lubricating-Oil, Preservative, Special
MIL-D-5028	Drawings and Data Lists; Preparation of (For Engines, Accessories and Other Auxiliary Equipment)
MIL-E-5272	Environmental Testing, Aeronautical and Associated Equipment, General Specification For
MIL-E-5400	Electronic Equipment, Airborne General Specification For
MIL-E-5558	Enamel; Wrinkle-Finish, For Aircraft Use
MIL-I-6181	Interference Limits and Tests: Aircraft Electrical and Electronic Equipment
MIL-P-6889	Primer; Zinc-Chromate, For Aircraft Use

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MIL-S-7513 Systems, Sets and Components, Methods
for Obtaining Assignment of Nomenclature
and Approval of Name-Plate Identification
and Description for Aeronautical
and Supporting Ground Equipment

MIL-C-9282 Container, Shipping, Metal Reusable 50
Cubic Feet Volume or Less

MIL-E-17555 Electronic Equipment and Associated
Maintenance Parts; Preservation,
Packaging, Packing, and Marking

Air Force-Navy Aeronautical

AN-L-1 Luminescent Material; Fluorescent

STANDARDS

Military

MIL-STD-129 Marking for Shipment and Storage

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

3. REQUIREMENTS

3.1 General.-- MA Series Bombing Navigational Systems shall conform to the requirements of this specification unless otherwise specified in the detail specification for a particular type of bombing navigational system or component thereof.

3.2 Materials and Processes.-- The materials, component parts, and mechanical assemblies used in the construction of the equipment but not specified in detail shall be of the lightest practicable weight and of highest quality compatible with the proposed and specified performance of the equipment. In general, the materials, component parts, and mechanical assemblies used in the equipment shall be the best commercially obtainable for each specific purpose or use. Non-inflammable material shall be employed to the greatest practicable extent in the construction of the equipment. Where there is any doubt as to the proper use of any material, component part or assembly not specified in detail, such matters shall be referred to the procuring activity for decision. The use of light-weight materials and weight saving designs are major considerations and shall be investigated and exploited to the greatest practicable extent.

3.2.1 Metals.-- Metals shall be of the corrosion-resistant type, unless suitably protected to resist corrosion during normal service life.

3.2.2 Standard Parts.-- AN Standard parts shall be used wherever they are suitable for the purpose, and shall be identified by their part numbers. Commercial utility parts such as screws, bolts, nuts, cotter pins, et cetera, may be used, provided they develop suitable properties and are replaceable by the AN Standard parts without alteration, and provided the corresponding AN part numbers are referenced on the drawings and in the parts lists. In applications for which no suitable corresponding AN part is in effect on date of invitation for bids, commercial parts may be used provided they conform to all requirements of this specification. For existing drawings, it will not be necessary to provide the corresponding part number for non-AN parts; however, when drawing revisions are made because of design changes or changes of parts, AN part numbers shall be referenced. Where possible and practical, AN part numbers shall be added when drawings are revised.

3.2.3 Protective Treatment.-- When materials are used in the construction of bombing navigational systems that are subject to corrosion in salt air or other atmospheric conditions likely to occur during service usage, they shall be protected against such corrosion in a manner that will in no way prevent compliance with the performance requirements of this or any applicable detail specification. The use of any protective coating that will crack, chip, or scale with age or extreme of atmospheric conditions shall be avoided.

3.2.3.1 All processes used (such as heat treatment, welding, electroplating, anodizing, magnetic inspection, X-ray inspection, etc.) shall be performed in accordance with applicable Government specifications, and have Government approval and certification.

3.3 Design.-- Bombing navigational systems shall be designed for operation in jet propelled bombardment aircraft as bombing devices and navigational aids, adaptable for utilizing either optical or radar or both information. They shall be capable of furnishing necessary output data to optical systems; to airborne radar equipment, through the use of radar interconnection units; and to existing automatic pilots through the use of interconnection units appropriate to each type of automatic pilot, for computing tracking, bomb release and navigational data.

3.3.1 Bombing navigational systems shall be designed so that the method of operation will be simple enough to permit their use efficiently with a minimum of specialized training.

3.3.2 The design of bombing navigational systems shall be such that the location of all external controls, that require adjustment during a bombing or navigational run, are readily accessible to the operator.

3.3.3 Special emphasis shall be placed on simplicity of design for ease of production, installation in aircraft and accessibility of internal mechanisms for replacement of parts or assemblies. There shall be a minimum requirement for special adjustments, calibration, routine servicing, maintenance, and special tools for accomplishing these functions.

3.3.4 Mounting.- Provisions shall be made for mounting each individual component with consideration being given to ease of installation and service replacement.

3.3.4.1 Anti-shock mounting shall be provided for each component which by nature of its design requires such mounting. Mounts shall be designed so that the component is not affected by vibration or flexibility, and shall provide adequate protection to insure maximum service life. Where possible, shock mounts, in accordance with Specification JAN-C-172, shall be used.

3.4 Electrical and Mechanical Requirements.- In general, the design requirements of the electronic equipment used in the bombing navigational systems shall be in accordance with Specification MIL-E-5400. The following paragraphs shall apply in lieu of the applicable paragraph of MIL-E-5400.

3.4.1 General.- Electronic components located within sealed units are not subject to any specification requirements. Only the most satisfactory components are selected to meet the specialized requirements of these units. With regard to components which are designed to operate and are operating as sealed units effectively isolated from environmental conditions such as moisture, corrosion, etc., all components within the interior of the sealed units are not subject to any general specification requirements. However, the complete unit will be required to meet the environmental conditions required by the detail component specification for that unit.

3.4.2 Connectors, Wired-In.- Plugs which are an integral part of sealed units are not required to meet the requirements of Specification MIL-E-5400. The requirements of Specification MIL-E-5400 shall not be applicable to AN connectors or to motor or synchro plugs internal to units.

3.4.3 Corrosion Resistance.- Plating will not be required on internal copper alloy parts where tolerances or function are impaired by use of such plating.

3.4.4 Dissimilar Metals.- Corrosion resisting ferrous alloys (stainless steel) may be used in contact with aluminum alloys where critical tolerances must be held. In cases where critical tolerances must be held, the use of copper alloy bushings pressed into aluminum is permissible. Protective coatings or plating will not be required in those cases where elimination of radio noise requires a positive ground or high accuracy machining tolerance. Tin-plated brass and tin-plated copper will be mounted directly to aluminum.

3.4.5 Aluminum Alloy.- The use of Iridite #14 (Alcoat #14) is approved as an alternate for zinc chromate for touch up of small areas where the anodic film has been removed during the process of manufacture. The anodic film may be permanently removed from areas where critical tolerances or electrical contact must be maintained, and from gear teeth.

3.4.6 Ferrous Alloys.- Corrosion resistant ferrous alloys need not be given a passivation treatment.

3.4.7 Plating.- The cadmium and zincate process of plating shall be considered satisfactory provided the finished part passes the fifty hour salt spray test.

3.4.8 Fuse Posts.- If the requirements of Specification MIL-E-5400 and the drawings specified in the detail specification conflict, the drawings shall govern.

3.4.9 Stability of "Q".- Coils used in sealed units shall not be required to meet the stability of "Q" requirements of Specification MIL-E-5400.

3.4.10 Laminated Thermosetting Plastic Materials, Sheets and Plates.- The requirements of Specification MIL-E-5400 shall not apply to the contents of hermetically sealed units.

3.4.11 Locking Devices and Lock Washers.- In addition to the methods given in Specification MIL-E-5400, flat-head screws, the heads of which are adjacent to metal (flush or below mounting surface), may also be staked by coating the head of the screw and the adjacent metal surface with purple glyptal (ZV903) or equivalent.

3.4.12 Panel Markings.- Specification MIL-E-5400 requirements for graduated scale marking on continuously variable controls shall not apply if the contractor shows that proper operation of the equipment does not require setting the control to a predetermined point. Graduations, position markings, etc., shall be legible in accordance with Specification AN-L-1.

3.4.13 Resistors.- In addition to the requirements of Specification MIL-E-5400, the following are applicable.

3.4.13.1 Variable resistors (potentiometers and rheostats) shall be considered to satisfy the salt spray requirements of their individually applicable MIL specification if they perform satisfactorily when subjected to salt spray tests while installed in the equipment (or equivalent). Salt spray requirements of applicable MIL specifications shall be waived for those variable resistors, contingent upon the satisfactory completion of the aforementioned tests. Requirements of this paragraph are waived whenever increased performance or an appreciable saving in space or weight is obtained by the use of a non-standard part.

3.4.14 Threads.- Screw threads will generally be of National Coarse Thread Series. Exceptions are made in the case of motor screws (or equivalent applications) sizes No. 2 and No. 3, in screws of No. 10 and larger, and in mounting screws size No. 4 for a production fan motor, wherein National Fine Thread Series will be used.

3.4.15 Tubes (Electron).- The tube types used shall be as specified on applicable drawings approved by the procuring activity. Whenever the tube types are unavailable as specified by applicable drawings, substitution may be made if previously approved by the procuring activity.

3.4.15.1 Tube Selection.-- The equipment, with exception of hermetically sealed amplifiers, shall be designed so it will conform to all requirements without tube selection. Equipment with hermetically sealed amplifiers from which required performance cannot be obtained without the employment of tube selection, will not be acceptable. Tube selection will be permitted on hermetically sealed amplifiers.

3.4.16 Wire (Hook-Up).-- The requirements of Specification MIL-E-5400 shall apply except in certain cases when the use of solid wire and smaller gage wire shall be permitted when space limitation prohibits the use of large size wire. In these cases, precautions will be taken to give adequate mechanical protection of the wires. If the application requires such, the use of high temperatures wire is permitted.

3.4.16.1 Insulation on Conductors.-- The requirements of Specification MIL-E-5400 shall apply except that sleeving greater than four inches may be used in sealed amplifiers.

3.4.17 Wiring (Internal).-- The requirements of Specification MIL-E-5400 shall apply except that in sealed amplifiers shields may be soldered to flat surfaces directly without any additional mechanical support.

3.4.17.1 The use of Ludlow Victor lacing cord, nylon cord, or tape shall be permitted.

3.4.18 Convenience.-- The requirements of Specification MIL-E-5400 are waived for sealed units since the original design objective called for a non-repairable unit.

3.4.19 Explosion Proofing.-- The requirements of Specification MIL-E-5400 shall not apply to motors, switches and synchros used in the sealed equipment.

3.4.20 Fungus Treatment.-- No treatment shall be required in sealed units.

3.4.21 Screw Assemblies.-- The definition of "tight" as found in specification MIL-E-5400 shall not apply.

3.4.22 Gears.-- Gear assemblies shall be properly aligned and meshed, and shall be operated without interference, tight spots, loose spots, or other irregularities. Backlash shall be held to a minimum consistent with good practice, design limits of the equipment, and performance requirements of the equipment.

3.4.23 Substitution of Parts and Materials.-- Where required, particularly due to critical material shortage, substitution of parts and materials may be made provided the procuring activity is furnished evidence that such a substitution in the particular equipment being furnished is at least equal to or better than the specific part or material specified or previously approved for the application. Samples may be required which will demonstrate, by tests, the suitability of the proposed substitution.

3.4.24 Use of Electronic Standard Parts and Materials.-- Requirements of MIL-E-5400 are waived whenever an appreciable saving in space or weight, or increased performance is obtained by use of a non-standard part if approved by the procuring activity.

3.4.25 Use of Individual Electronic Standard Parts and Materials.-- The requirements of MIL-E-5400 are waived whenever an appreciable saving in space or weight or increased performance is obtained by the use of a non-standard part if approved by the procuring activity.

3.4.26 Coding.-- The requirements of MIL-E-5400 shall apply only to connecting cables between units.

3.4.27 Diagrams, Schematic.-- The requirements of MIL-E-5400 shall not apply.

3.4.28 Lubricants.-- Where possible, design shall be such as to preclude lubrication requirements for the service life of the equipment.

3.4.28.1 Unless otherwise specified, all points requiring lubrication shall be lubricated with a light rust-preventive oil in accordance with Specification MIL-L-644.

3.4.29 Reference Symbol Designations For Component Parts.-- The requirements of MIL-E-5400 shall govern except in those cases where previous approval has been granted by the procuring activity.

3.4.30 Materials and Processes.-- In lieu of the requirements of MIL-E-5400, the silk screening may be applied to the main casting without the use of a separate plate.

3.4.31 Mounting.-- Permanent labels (except rubber-stamping, silk screening, and decalomania) shall be securely and permanently mounted using screws or rivets.

3.4.31.1 Where space does not permit, the requirements of MIL-E-5400 shall not apply.

3.4.32 Thread Engagement.-- Where it is impractical to meet the requirements of MIL-E-5400, the requirements shall be waived.

3.4.33 Soldering Flux.-- The requirements of MIL-E-5400 shall apply whenever possible. If a moisture and fungus resistant treatment is applied to each soldered connection the use of soldering flux which is fungus-nutrient is permitted where an equally non-nutrient flux is not available.

3.4.34 Terminals.-- The design requirements reflected in the contract referenced drawings shall govern usage of types of terminals where there is a conflict with the requirements of this section.

3.4.35 Set Screw Wrenches.- Standard tools shall not be provided on units but any special tools shall be mounted on the equipment.

3.4.36 Power Transformers and Inductors.- The requirements of MIL-E-5400 shall not apply to transformers used in sealed units. Where previously approved by the procuring activity, transformers may be treated with "Fosterite", or equivalent, if the wire size is 37 or larger, in order to save space and weight.

3.4.37 Miniature Tube Sockets.- The requirements of MIL-E-5400 shall apply except in the case of the sockets used in sealed amplifiers.

3.4.38 Welding.- The joining surfaces of all parts to be welded shall be thoroughly cleaned of foreign matter which will interfere with proper welding. All welds shall have good fusion and be of ample size to develop the full strength of the connected parts. Any weakening of the welded parts a short distance from the weld, due to annealing as a result of the welding process, shall not reduce the strength below the design requirements. When harmful stresses may result from welding, the welded parts shall be annealed sufficiently to remove the stresses. All welds shall be cleaned of scale and oxidation products and the excess flux shall be removed. Electrodes used in arc welding shall be of a type which will produce a weld having chemical and physical properties similar to those of the parent metal. When spot welding is used to permanently secure parts, the number of welds shall be sufficient to provide adequate strength, with no less than two welds on each part.

3.4.39 Shock.- The 30G's shock test specified in MIL-E-5400 shall apply as the drop-test requirement with the equipment packed.

3.4.40 Three- Phase AC Power.- The requirements of MIL-E-5400 shall not apply.

3.4.41 Direct Current Power.- The design of equipment utilizing d-c power shall be such that the negative of the power input source can be externally grounded.

3.4.41.1 27.5 Volts; Power Source.-

(1) Voltage Limits: 26 to 29 Volts

3.5 Construction.- Components of bombing navigational systems, shall be so constructed that no parts will work loose during service usage. They shall be built to withstand strains, jars, vibrations and other conditions incidental to shipping, storage, installation, and service.

3.6 Performance.- Bombing navigational systems shall meet the following performance tests:

Bench Functional
Temperature Range
Altitude
Humidity
Vibration
Sand
Salt Spray
Fungus

3.7 Interchangeability.- All parts having the same manufacturer's part number shall be directly and completely interchangeable with each other with respect to installation and performance. Changes in manufacturer's part numbers shall be governed by the drawing number requirements of Specification MIL-D-5028.

3.8 Weight.- The weight of the component parts of bombing navigational systems shall be an absolute practicable minimum and shall not exceed the weight specified in the detail specification.

3.9 External Finish.- With the exception of mounting surfaces, exterior surfaces shall be coated overall with zinc chromate primer and a baked wrinkle finish enamel in accordance with Specification MIL-P-6889 and Specification MIL-E-5558.

3.10 Marking, Identification and Nomenclature.- Nomenclature approval and marking of parts and equipment for identification purposes shall be in accordance with MIL-S-7513.

4. QUALITY ASSURANCE PROVISIONS

4.1 Classification of Tests.- The inspection and testing of bombing navigational systems shall be classified as follows:

a. Preproduction Tests.- Preproduction tests are those tests made on a sample representative of the production bombing navigational system or component to determine that the production equipment meets the requirements of this specification.

b. Acceptance Tests.- Acceptance tests are those tests accomplished on bombing navigational systems manufactured and submitted for acceptance under contract.

4.2 Test Conditions.- Unless otherwise specified, all tests and inspections outlined herein, shall be conducted at ambient room temperature. The nominal for ambient room temperature is assumed to be $70^{\circ} \pm 2^{\circ}$ Centigrade.

4.3 Preproduction Tests.- Preproduction tests shall be performed by the contractor under the supervision of the procuring activity, and shall include the tests specified herein and in the detail specification.

4.3.1 Preproduction Test Sample.- The detail specification or the contract shall state the number of preproduction samples required.

4.3.2 Temperature Range.- The equipment shall be placed in operation at the ambient room temperature, approximately 20°C (68°F), and the ambient temperature then reduced to -55°C (-67°F) where it shall be held reasonably constant for 3 hours, during which time the equipment shall operate continuously in a satisfactory manner. The ambient temperature shall then be raised +20°C (+68°F) and the equipment checked for satisfactory operation.

4.3.2.1 The equipment shall be placed in operation at the ambient room temperature, approximately +20°C (+68°F) and the ambient temperature then raised to +40°C (+104°F) where it shall be held reasonably constant for a period of 3 hours, during which time the equipment shall operate in a satisfactory manner. The equipment shall then be stopped and the ambient temperature raised to +71°C (+160°F) at which temperature it shall remain for a period of 16 hours. The equipment shall then be started and operate satisfactorily for a period of 3 hours. The ambient temperature shall then be reduced to approximately +40°C (+104°F) and the equipment operated for a period of 1-1/2 hours, during which time the equipment shall function satisfactorily. The ambient temperature shall then be reduced to +20°C (+68°F) and the equipment checked for satisfactory operation.

4.3.2.2 During the temperature cycles, the equipment shall be carefully inspected for any evidence of malfunction and at the completion of these cycles, the equipment shall not show any evidence of corrosion, electrolysis, warpage, breakage, etc.

4.3.3 Altitude.- The equipment shall be placed in operation at the ambient room temperature and pressure. The pressure shall then be reduced to the approximate pressure corresponding to 50,000 feet of altitude or 60,000 feet of altitude for the Extended Range Type MA-systems, and the ambient temperature shall be reduced to minus 55° Centigrade (minus 67 degrees Fahrenheit). The equipment shall be given a functional test as specified herein and operate satisfactorily for a period of three hours. At the completion of these tests, the equipment shall be taken from the test chamber

while at minus 67 degrees Fahrenheit, into a chamber in which the temperature is plus 68 degrees Fahrenheit and placed in operation. The resulting condensation within or on the equipment shall not prevent the use or functioning of the equipment.

4.3.4 Humidity.- The equipment while inoperative shall be subjected to not less than 90 percent relative humidity at plus 50 degrees Centigrade (plus 122 degrees Fahrenheit) for a period of 16 hours. At the end of this period, the equipment shall be placed in an ambient temperature of plus 20 degrees Centigrade (plus 68 degrees Fahrenheit) with a relative humidity of not less than 60 percent for a period of three hours. The equipment shall operate satisfactorily during and after this humidity and temperature variation cycle. At the completion of the tests, the equipment shall be carefully inspected for any evidence of corrosion, warpage, electrolysis, etc.

4.3.5 Vibration.- The equipment shall be mounted on a suitable vibration device which can be vibrated at any desired frequency between 500 and 3000 cycles per minute and shall subject the equipment to a total excursion of not less than 0.036 inches. The equipment shall be in operation during this test. The frequency of vibration during test shall be 2500 cycles per minute for a period of one hour followed by a one-hour period at a frequency of 1500 cycles per minute. During the test periods and upon completion of the test, the equipment shall function in accordance with specified requirements. No looseness or damage to any part of the equipment shall result from the vibration.

4.3.6 Sand and Dust.- Unless otherwise specified, all components of bombing navigational systems shall be tested for effectiveness of sealing against the entry of sand and dust particles by being subjected to a sand test in accordance with Specification MIL-E-5272, Procedure I.

4.3.7 Salt Spray.- Unless otherwise specified, the equipment shall be subjected to a salt spray test in accordance with Specification MIL-E-5272, Procedure I for a period of 50 hours. Destructive corrosion, electrolysis or residue which would impair the use of mechanical-electrical functioning of the equipment shall not be tolerated.

4.3.8 Fungus Resistance.- All fungus-nutrient materials used in the equipment after being treated with the required fungicide shall be tested for resistance to fungus action in accordance with the provisions of Specification MIL-E-5272, Procedure I.

4.3.9 Radio Interference.- Radio interference tests shall be conducted in accordance with applicable paragraphs of Specification MIL-I-6181.

4.4 Acceptance Tests.- Acceptance tests shall consist of Individual and Sampling tests.

a. Individual Test.- Individual tests are those tests run on each item manufactured to determine whether it meets the accuracy and general performance requirements of the detail specification.

b. Sampling Test.-- Sampling tests are those tests run on selected items in accordance with the sampling requirements of the detailed specification to determine that the function or performance of the equipment has not been adversely affected by design changes, variation changes, etc.

4.4.1 Individual Tests.-- Each component shall be subjected to the following tests:

4.4.1.1 Visual Inspection Test:

4.4.1.1.1 Physical Conditions.-- Inspection plates or access covers shall be removed and the interior inspected for workmanship, corrosion, chips, etc.

4.4.1.1.2 Electrical.-- Equipment shall be inspected for proper connection of switches, selsyns, motors, and the like.

4.4.1.1.3 Legibility of Marking.-- Graduations, position markings, etc., shall be inspected for legibility in accordance with procedure as specified in Specification AN-L-1.

4.4.1.2 Bench Functional Tests:

4.4.1.2.1 The various components of the bombing navigational system shall be suitably interconnected to simulate actual installation and test runs shall be run in accordance with the applicable bombing navigational computer specifications to determine that static and dynamic functioning of the system and the degree of accuracy are satisfactory and within limits specified.

4.4.1.2.2 Static Tests.-- A suitable selection of values for the bombing navigational system inputs will be made to cover representative variations in all functions involved. The corresponding output values will be recorded and compared with pre-computed results.

4.4.1.2.3 Dynamic Tests.-- Variations of inputs shall be made under certain conditions and proper operation indicated by an invariant value for output functions.

4.4.2 Sampling Test.-- Each system or component thereof shall be selected in accordance with the applicable system or individual component specification and subjected to the tests of paragraph 4.3.

4.5 Rejection and Retest:

4.5.1 Individual components and complete systems failing to meet their respective test requirements shall be rejected. Rejected equipment shall not be resubmitted for inspection without furnishing the authorized representative of the procuring activity full particulars concerning previous rejection and measures taken to correct the defects.

4.5.2 Unless otherwise specified by the procuring activity the equipment under test shall satisfactorily pass the sampling tests. These tests shall

be conducted by or under the supervision of an authorized Government representative. If any selected unit fails to meet the requirements of the sampling tests during the course of an order, one or more additional samples may be selected at random by the Government representative. If any of these fail to pass the tests, the procuring activity shall be notified for instruction regarding disposition unless otherwise instructed by the procuring activity. No further unit will be delivered until cause for failure has been determined and corrected by the contractor as evidenced by successful testing of representative samples of the equipment incorporating the corrected parts.

5. PREPARATION FOR DELIVERY

5.1 All preservation, packaging, packing, and marking shall conform to the requirements of Specification MIL-E-17555. A container conforming to Specification MIL-C-9282 shall be added to paragraph on "Reusable Container" of Specification MIL-E-17555. All preservation, packaging, and packing must pass a preproduction test, conforming to Specification MIL-E-17555 and Specification MIL-P-116, at the contractor's plant before acceptance, except for those items specifically waived by the procuring activity.

5.2 Marking.-- Marking of interior packages and exterior shipping containers shall be in accordance with MIL-STD-129.

6. NOTES

6.1 Use.-- Bombing navigational systems are intended to be used for accurately determining bomb release and navigational data based on information obtained either optically or by radar or both.

PATENT NOTICE: When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.