

MIL-T-9026B(USAF)

12 October 1965

Superseding

MIL-T-9026A(USAF)

19 July 1955

MILITARY SPECIFICATION

TABLE, GYRO INSTRUMENT TESTING, TYPE MA-1

1. SCOPE

1.1 This specification covers one type of instrument test turntable designated Type MA-1.

2. APPLICABLE DOCUMENTS

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

SPECIFICATION

Federal

QQ-P-416
PPP-B-636

Plating, Cadmium (Electrodeposited)
Boxes, Fiberboard

Military

MIL-W-76

MIL-P-116
MIL-C-5015
MIL-C-5541

MIL-S-7742

MIL-A-8625

MIL-D-70327

Wire and Cable, Hook-Up
Electrical Insulated
Preservation Methods Of
Connectors, Electric, AN, Type
Chemical Films and Chemical
Film Material for Aluminum
and Aluminum Alloys
Screw Threads, Standard
Optimum Selected Series General
Specification For
Anodic Coating for Aluminum
and Aluminum Alloys
Drawings, Engineering and As-
sociated Lists

STANDARDS

Federal

FED-STD-595

Colors

FSC 4920

MIL-T-9026B(USAF)

Military

MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of U. S. Military Property
MIL-STD-143	Specification and Standards Order of Precedence for The Selection Of
MIL-STD-808	Finishes, Protective and Codes For Finishing Schemes For Ground and Ground Support Equipment
MIL-STD-1186	Cushioning, Anchoring, Blocking, Bracing and Waterproofing with Appropriate Test Methods
MS3102	Connector, Receptacle Electric, Box Mounting

DRAWINGS

Air Force

50D8036	Bracket Assembly-Turntable, Instrument Case
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(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions shall be obtained from the procuring activity or as directed by the contracting officer.)

3. REQUIREMENTS

3.1 Component parts. The table shall consist of a case which houses a synchronous motor to provide power, a mechanism for transferring this power to a plate mounted on the case, and a switching mechanism for rotating the plate at specified rates. It shall be mounted on leveling screws and means shall be provided for mounting gyro instrument test fixtures.

3.2 Specifications and standards. Specifications and standards for all materials, parts, and Government certification and approval of processes and equipment, which are not specifically designated herein and which are necessary for the execution of this specification, shall be selected in accordance with MIL-STD-143, except as provided in the following paragraph:

3.2.1 Standard parts. AN or MS 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 have suitable properties and are replaceable by the AN or MIL standard parts without alteration, and provided the corresponding AN or MIL part numbers are referenced on the drawings and in the parts lists. In applications for which no suitable corresponding AN or MIL part is in effect on date of invitation for bids, corresponding parts may be used provided they conform to the requirements of this specification.

3.2.2 Protective treatment. When materials are used in the construction of the table that are subject to deterioration when exposed to climatic and environmental conditions likely to occur during service usage, they shall be protected against such deterioration in a manner that will in no way prevent compliance with the performance requirements of this specification. The use of any protective coating that will crack, chip, or scale with age or extremes of climatic and environmental conditions shall be avoided.

3.3 Design and construction. The table shall be designed and constructed so that no parts will work loose in service. It shall be built to withstand the strains, jars, vibrations, and other conditions incident to shipping, storage, installation, and service.

3.3.1 The table shall be constructed so that adjustment and repairs can be easily made by personnel of operating units and overhaul bases.

3.3.2 The table and its relating parts shall be of magnesium construction when practicable and shall be in accordance with figures 1 and 2 and as specified herein. It shall consist of a stationary base on which is mounted a rotating plate with provisions for mounting a bracket assembly conforming to Air Force Drawing 50D8036. The plate shall be mounted on the base by means of a center shaft which is electrically driven by a synchronous motor through the use of a variable speed mechanism. Means shall be provided for transmitting electrical and pneumatic power through the base to the plate.

3.3.2.1 Base. The base shall be constructed in accordance with figures 1 and 2. It shall form a housing which contains a motor, a double pole single throw toggle switch for operating the motor, variable speed mechanism, direction selector, and electrical and pneumatic power connections. The base shall be provided with 4 leveling screws and 2 handles as shown on figure 1. The base shall be scribed or engraved with the data specified on figure 1 for the toggle switch, rate selector, and direction selector.

3.3.2.1.1 The electrical connector shown on figure 1 to be on the right side of the case may be placed either on the right or on the back of the case.

3.3.2.1.2 Motor and direction selector. The motor shall be a 115V, 60 cycle synchronous type controlled by a 3-position selector switch mounted on the base as shown on figure 1. The switch shall control the motor rotation as follows: Center position off, right turn position rotates the plate clockwise, and left turn position reverses the motor, turning the plate in a counterclockwise direction.

MIL-T-9026B(USAF)

3.3.2.1.3 Variable speed mechanism. The variable speed mechanism shall be constructed so that it will vary the rotation of the plate at rates of 36, 90, 180, 360, and 1080° per minute. The rate of rotation shall be selected through the use of the speed control located as shown on figure 1. A friction drive shall be utilized in driving the plate; however, if a friction drive is unsuitable due to design characteristics, a drive suitable to the procuring activity may be utilized. All gears utilized in the construction of the table mechanism shall be anti-backlash gears, wherever possible, so as to provide smooth operation without binding, chatter, or backlash of gears. When the switches are in the off position, the plate shall be free to rotate manually. When set to a rate, the rate selector shall lock securely in place and shall operate smoothly to allow ease of switching from one rate to another.

3.3.2.2 Plate. A 12-inch diameter plate shall be rigidly mounted on the center shaft which extends through the top of the base. The plate shall have a maximum thickness of 2 inches; however, this thickness shall be kept to a minimum but shall provide sufficient space around the edge for mounting the power outlets and scale as shown on figure 1 and 2. The scale shall be scribed or engraved around the edge at every degree and numbered at every 10° starting with zero. Each 1° line shall be 1/8 inch long, each 5 and 10° line 1/4 inch long, and the numerals 1/4 inch high. A pointer shall be provided in the front center of the base as shown on figure 1. The top surface of the plate shall be flat within ±0.005 inch and the outer edge of the top surface shall run true to the center shaft within ±0.005 inch. The plate shall be mounted on the center shaft as shown on figure 3. It shall be a slide fit so as to be easily removable, but must not affect concentricity or rigidity. It shall be fastened to a collar, provided on the center shaft, by 3 flat head screws and located by 1 stud. An "O" ring may be used to furnish the vacuum line seal between the plate and center shaft. The edge of the plate shall be constructed so as to be almost flush with the top of the base thus forming a complete cover for the brushes and rings contained therein.

3.3.2.3 Electrical construction. Electrical power shall be transmitted from the electrical receptacles in the base to the electrical receptacles in the plate by means of spring loaded carbon brushes and collector rings mounted between the base and the plate. Fourteen brushes shall be mounted on the top surface of the base and fourteen collector rings shall be imbedded in the under surface of the plate. Electrical receptacle "A" in the base shall be connected to electrical receptacle "AA" in the plate, pin A to pin A, and so on. All receptacles shall be so connected. Electrical receptacles shall be in accordance with MIL-C-5015. Cable shall be No. 16 braided covering in accordance with MIL-W-76.

3.3.2.4 Pneumatic power connection. Pneumatic power shall be transmitted from the 3/8 inch pipe connection in the base as shown on figure 1 through the center shaft and plate as shown on figure 3, to the 3/8 inch pipe connection in the plate as shown on figure 2. A swivel connection shall be provided on the lower end of the center shaft to allow rotation of the shaft. The 3/8 inch pipe connection on the base and on the plate shall be securely fastened in place. The pneumatic power line and connections shall be designed to withstand a pressure or vacuum of 6 inches Hg.

3.3.2.5 Fixture locating stud. The fixture locating stud shall be constructed and mounted as shown on figure 1 through 4. It shall be located by one pin stud and fastened by two flat head screws as shown on figure 3.

3.3.2.6 Figure locating dowel screws. Two fixture locating dowel screws and the fixture locating stud specified in 3.3.2.5 shall provide the means of locating instrument mounting fixtures. The dowel screws shall be constructed in accordance with figure 4.

3.3.2.7 Bracket assembly. A bracket assembly constructed in accordance with Air Force Drawing 50D8036 shall be provided for mounting instrument under test. The bracket assembly shall mount upon the plate and shall be located by means of the screw turntable dowels.

3.4 Performance. The table shall be capable of meeting the tests specified in section 4.

3.5 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 the manufacturer's part numbers shall be governed by the drawing number requirements of MIL-D-70327.

3.6 Weight. The weight of the complete table shall not exceed 70 pounds.

3.7 Finishes and protective coatings.

3.7.1 Aluminum alloy parts. Aluminum alloy shall be covered with an anodic film conforming to MIL-A-8625, except as follows:

3.7.1.1 Aluminum alloys which do not anodize satisfactorily shall be coated with a chemical film in accordance with MIL-C-5541.

3.7.1.2 Where the primary purpose of the treatment is to afford a suitable paint base, chemical treatments in accordance with MIL-C-5541 may be used in lieu of anodizing.

3.7.1.3 Castings containing non-aluminum alloy integral inserts may be treated with a chemical film in accordance with MIL-C-5541 in lieu of anodizing.

3.7.1.4 When abrasion resistance is a factor, chemical films in accordance with MIL-C-5541 shall not be used in lieu of anodizing.

3.7.2 Cadmium plating. Cadmium plating shall be in accordance with QQ-P-416, Type I, Class B.

3.7.3 Final finish. The complete table shall be finished in accordance with MIL-STD-808, Color No. F49A-4 and Color No. 3610 of FED-STD-595. All engraved lines, numerals, and lettering shall be filled with black enamel.

3.8 Identification of product. Equipment, assemblies, and parts shall be marked for identification in accordance with MIL-STD-130.

MIL-T-9026B(USAF)

3.9 Workmanship.

3.9.1 General. The table, including all parts and accessories, shall be fabricated and finished in a thoroughly workmanlike manner. Particular attention shall be given to freedom from blemishes, defects, burrs, and sharp edges; accuracy of dimensions, radii of fillets, and marking of parts and assemblies; thoroughness of soldering, welding, brazing, painting, wiring and riveting, alignment of parts and tightness of assembly screws and bolts, et cetera.

3.9.2 Riveting. Riveting operations shall be performed to insure that the rivets are tight and satisfactorily headed.

3.9.3 Cleaning. The table shall be thoroughly cleaned, and loose, spattered, or excess solder, metal chips, and other foreign material removed during and after final assembly.

4. QUALITY ASSURANCE PROVISIONS.

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

4.2 Classification of tests. The inspection and testing of the steel shall be classified as acceptance tests.

4.2.1 Acceptance tests. All tests required for testing the table are classified as acceptance tests and are restricted to individual tests.

4.2.1.1 Individual tests. Each table shall be subjected to the following tests:

4.2.1.1.1 Examination of product. The table shall be inspected to determine compliance with the requirements specified herein with respect to material, workmanship, and marking.

4.2.1.1.2 Functional. The electrical outlet of the assembly shall be connected to a 115V ac, 60 cycle power source. With the direction selector switch in the "OFF" position and the rate selector knob in the 0° position, the plate shall rotate freely to the right and left when manually rotated. The rate selector switch shall be turned to the 36° position and the direction selector switch turned to the right position. The plate shall rotate clockwise. The direction switch shall then be turned to the left turn position and the plate shall rotate counterclockwise. Each rate shall be checked and timed through a complete revolution.

4.2.1.1.3 Scale error. With the power source connected and the rate selector switch set in the 36° position, the direction switch shall be turned to the right turn position. The rotation of the plate shall be timed with a stop watch

by checking the plate scale with the pointer on the base. At the end of 1 minute of rotation, the plate shall have turned 36°. The direction selector switch shall be turned to the left turn position and thus checked. The stand shall be checked thus at each specified rate. The plate shall rotate at the specified rates within ± 3 seconds of the specified time.

4.2.1.1.4 Electrical performance. Each pin of the receptacles on the base shall be checked with its corresponding pin in the receptacles on the plate with an ohmmeter while the plate is revolved through 360°. Firm contact shall be made at all times.

4.2.1.1.5 Weight overload. A weight of 58 pounds shall be placed on the plate and the plate revolved at each rate through 360°. The plate shall rotate smoothly at all times and no damage shall result from this test.

4.3 Inspection of the preservation, packaging and marking for shipment and storage. Sample items or packs and the inspection of the preservation, packaging, packing and marking for shipment and storage shall be in accordance with the requirements of section 5, or the documents specified therein.

5. PREPARATION FOR DELIVERY.

5.1 Preservation and packaging shall be level A or C as specified (see 6.2).

5.1.1 Level A. Each table shall be preserved and packaged in accordance with Method IIB of MIL-P-116. The exterior container shall conform to the required level of packing (see 5.2.1 or 5.2.2).

5.1.2 Level C. Each table shall be preserved and packaged in accordance with the manufacturer's commercial practice.

5.2 Packing shall be level A, B or C as specified (see 6.2).

5.2.1. Level A. Each table preserved and packaged as specified in 5.1.1 shall be packed in a container conforming to PPP-B-636, Grade V3C. Closure, waterproofing and strapping shall be in accordance with the appendix of the same specification. Containers shall be of uniform size and shape and of minimum tare and cube.

5.2.2 Level B. Level B packing shall be the same level A except that the exterior container shall conform to PPP-B-636, Type CF, Class Domestic, Variety SW, Grade 350 and waterproofing is not required.

5.2.3 Level C. Each table preserved and packaged as specified in 5.1.2 shall be packed in a manner to insure carrier acceptance and safe delivery at destination. Containers shall conform to Uniform Freight Classification Rules or regulations of other carriers as applicable to the mode of transportation.

5.3 Physical protection. Interior cushioning, blocking and bracing shall be in accordance with MIL-STD-1186. Tests: Free-fall drop test shall be in

MIL-T-9026B(USAF)

accordance with Appendix A of the same standard. Tests are not required when level C packing is specified.

5.4 Marking. In addition to any special marking required by the contract or order, interior packages and exterior containers shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Use. The Type MA-1 table covered by this specification is intended for use in furnishing rates of turn in azimuth, to the right and left, of 36°, 90°, 180°, 360°, and 1080° per minute, for testing gyroscopic devices in repair depots.

6.2 Ordering data. Procurement documents should specify the following:

a. Level of preservation, packaging and packing desired (see 5.1 and 5.2).

6.3 Asterisks are not used in this revision to identify changes with respect to previous issue, due to the extensiveness of the changes.

Custodians:

Air Force - 82

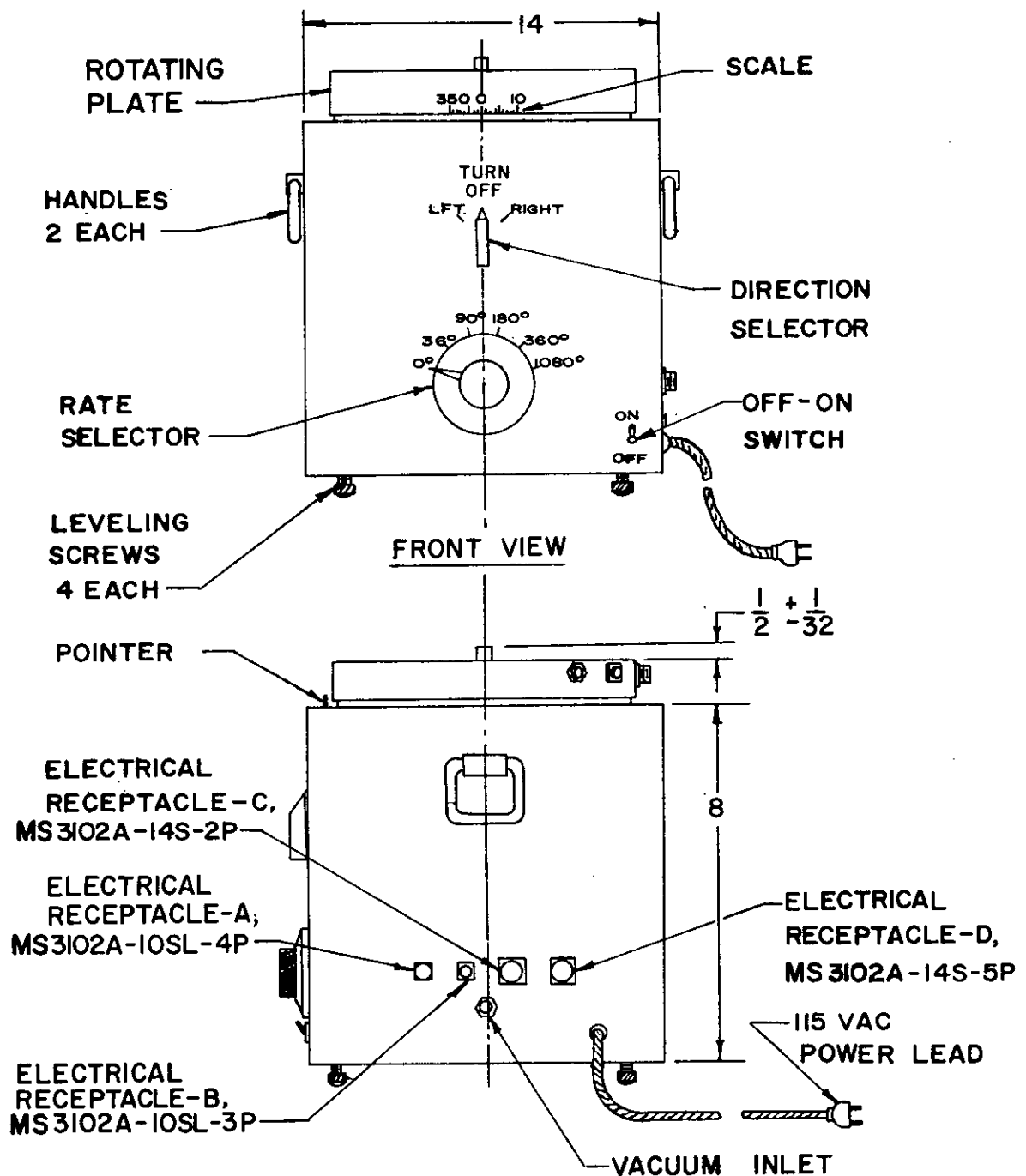
Preparing activity:

Air Force - 82

Reviewers:

Air Force - 82

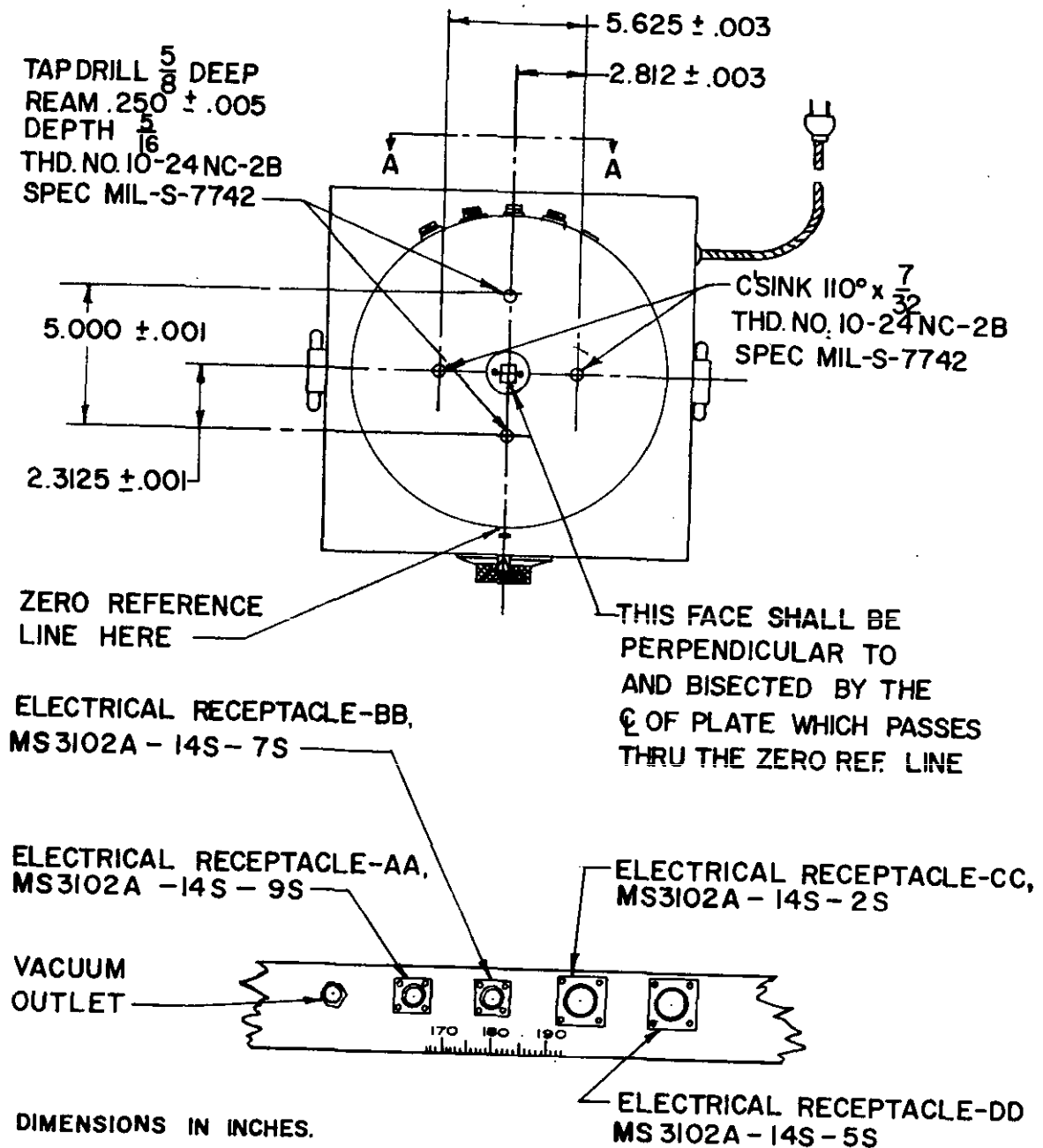
Project Nr. 4920-FO24



DIMENSIONS IN INCHES
UNLESS OTHERWISE
SPECIFIED, TOLERANCES:
FRACTIONS $\pm \frac{1}{16}$

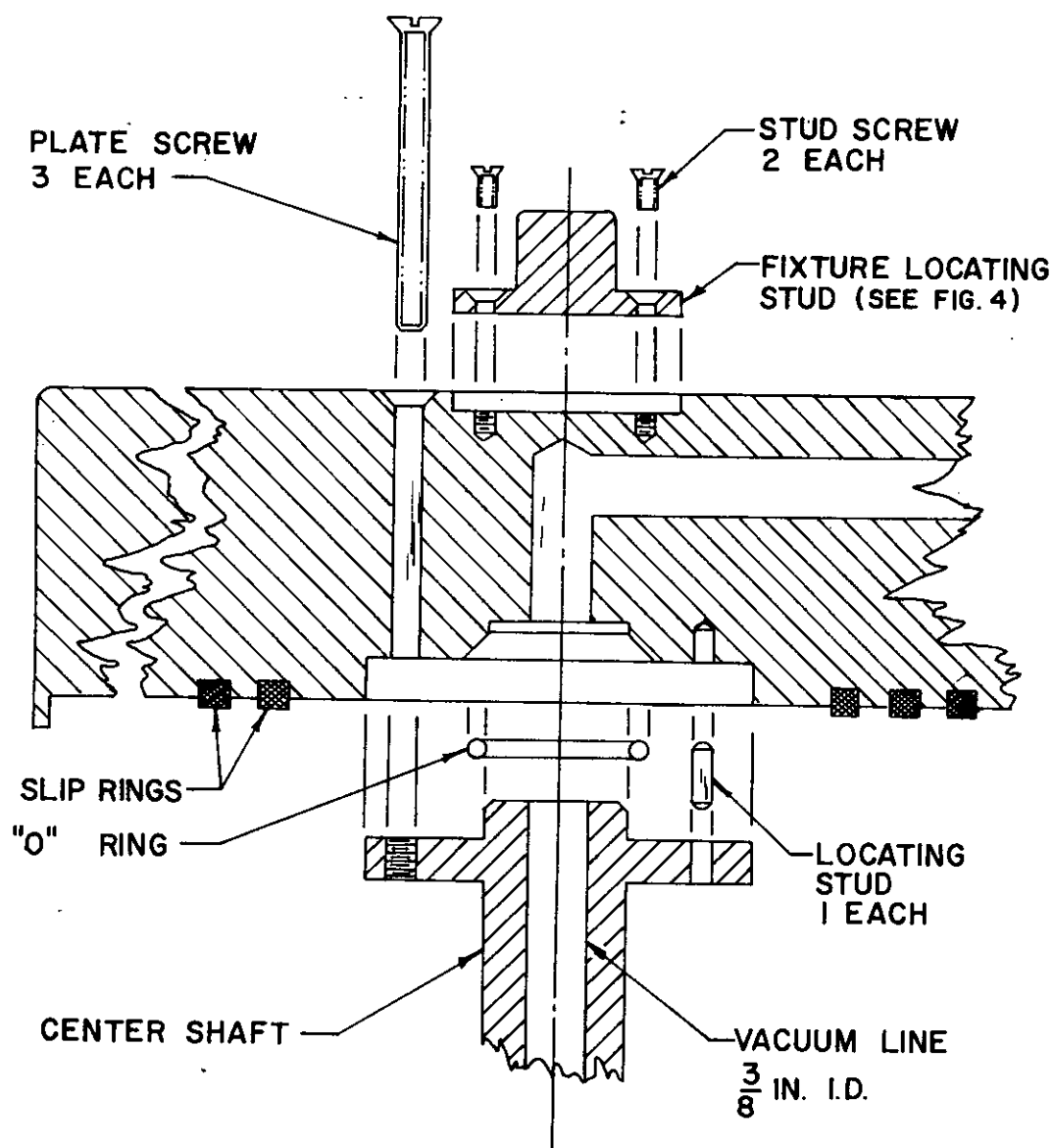
FIGURE 1

MIL-T-9026B(USAF)



VIEW A-A
FIGURE 2

MIL-T-9026B(USAF)



SECTIONAL VIEW OF PLATE

DIMENSIONS IN INCHES

FIGURE 3

FOLD

POSTAGE AND FEES PAID

OFFICIAL BUSINESS

San Antonio Air Materiel Area
Standardization Branch (SANSS)
Kelly AFB, Texas 78241

FOLD

SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 119-R004
<p align="center"><u>INSTRUCTIONS</u></p> <p>This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use of the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity.</p>		
SPECIFICATION		
ORGANIZATION		CITY AND STATE
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT \$
MATERIAL PROCURED UNDER A		
<input type="checkbox"/> Direct Government Contract <input type="checkbox"/> Subcontract		
1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?		
A. GIVE PARAGRAPH NUMBER AND WORDING		
B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES		
2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID		
3. IS THE SPECIFICATION RESTRICTIVE?		
<input type="checkbox"/> YES <input type="checkbox"/> NO IF "YES" IN WHAT WAY?		
4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)		
SUBMITTED BY (Printed or typed name and activity)		DATE