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SUPERSEDING (SEE 6.5)
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9 April 1970

MILITARY SPECIFICATION

CONNECTORS, COAXIAL, RADIOFREQUENCY;

GENERAL SPECIFICATION FOR

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the general requirements and tests for radiofrequency connectors used with flexible RF cables and certain other types of coaxial transmission lines.

1.2 Classification. Connectors shall be of the following classes, categories, and part numbers, as specified (see 3.1).

1.2.1 Class. The class of connectors shall consist of the following:

a. Class 1 - A class 1 connector is a connector which is intended to provide superior RF performance at specified frequencies, and for which all RF characteristics are completely defined.
b. Class 2 - A class 2 connector is intended to provide mechanical connection within an RF circuit providing specified RF performance.

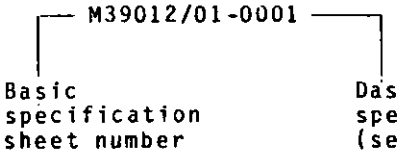
1.2.2 Categories. The categories of connectors shall be designated by an A (field serviceable), B (non-field replaceable), C (field replaceable solder center contact), D (field replaceable crimp center contact) and E (field replaceable). as follows:

a. Category A - Connectors which do not require special tools to assemble shall be designated as category A connectors. Standard wrenches, soldering equipment, pliers, etc., are not defined as special tools.
b. Category B - Connectors which require special tools to assemble shall be designated as category B connectors. These connectors may be used for original installations. Field replacement is intended to be made by category A or C connectors. Category B connectors will not be stocked or procured by the Government.
c. Category C - Connectors which require only standard military crimping tools and standard cable stripping dimensions to assemble shall be designated as category C connectors. The standard military crimping tool shall be as specified (see 3.1).
d. Category D - Connectors which require only standard military crimp tools for the center contact and outer ferrule, and standard cable stripping dimensions to assemble shall be designated as category D connectors. The standard military crimp tools shall be as specified (see 3.1).
e. Category E - Connectors using semi-rigid cables with standard stripping dimensions and using standard military tools.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: US Army Communications Electronics-Command, ATTN: DRSEL- ED-TO , Fort Monmouth, NJ 07703 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

1.2.3 Part number. The part number shall consist of the letter "M" followed by the basic specification sheet number, and a sequentially assigned dash number which is used to designate the material of the connector body (shell); i.e.: The four-digit dash number (-0001, -0002, etc) designates the material as brass. An insertion of 1 as the first digit of the four-digit number (-1001, -1002, etc) designates phosphor bronze. A 2 is inserted to designate aluminum (-2001, -2002, etc). A 3 shall designate corrosion resistant steel (-3001, -3002, etc), and a 4 shall designate copper beryllium (-4001, -4002, etc). (See 3.1 and 6.3.)

Example:



2. APPLICABLE DOCUMENTS

2.1 Government specifications and standards. Unless otherwise specified, the following specifications and standards, of the issue listed in that issue of the Dpeartment of Defense Index of Specifications and Standards specified in the solicitation, form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

L-P-389	Plastic Molding Material, FEP Flurocarbon, Molding and Extrusion.
L-P-403	Plastic Molding Material, Polytetrafluoroethylene (TFE-Flurocarbon).
O-F-499	Flux, Brazing, (Silver Alloy, Low-Melting Point).
QQ-A-225/6	Aluminum Alloy Bar, Rod, and Wire; Rolled, Drawn or Cold Finished, 2024.
QQ-B-613	Brass, Leaded and Non-Leaded: Flat Products (Plat, Bar, Sheet, and Strip).
QQ-B-626	Brass, Leaded and Non-Leaded: Rod, Shapes, Forgings, and Flat Products with Finished Edges (Bar and Strip).
QQ-B-654	Brazing Alloy, Silver.
QQ-B-750	Bronze, Phosphor; Bar, Plate, Rod, Sheet, Strip, Flat Wire, and Structural and Special Shaped Sections.
QQ-C-530	Copper-Beryllium Alloy Bar, Rod and Wire (Copper Alloy Numbers 172 and 173).
QQ-C-533	Copper-Beryllium Alloy Strip (Copper Alloy Numbers 170 and 172).
QQ-C-576	Copper Flat Products with Slit, Slit and Edge - Rolled, Sheared, Sawed, or Machined Edges, (Plate, Bar, Sheet, and Strip).
QQ-S-571	Solder; Tin Alloy; Lead-Tin Alloy; and Lead Alloy.
QQ-S-763	Steel Bars, Wire, Shapes and Forgings, Corrosion-Resisting.
WW-T-799	Tube, Copper, Seamless, Water and Refrigeration (For use with Solder Flared - or Compression Type Fittings)
ZZ-R-765	Rubber, Silicone.

MILITARY

MIL-F-14072(SigC)	Finishes for Ground Electronic Equipment.
MIL-I-17214	Indicator, Permeability Low-Mu (Go-No-Go).
MIL-G-45204	Gold Plating, Electrodeposited.
MIL-C-55330	Connectors, Preparation for Delivery of.

(See supplement 1 for applicable specification sheets.)

STANDARD

MILITARY

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-130	Identification Marking of U.S. Military Property.
MIL-STD-202	Test Methods for Electronic and Electrical Component Parts.
MIL-STD-45662	Calibration Systems Requirements.

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

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM-A-484 -	General Requirement for Stainless and Heat-Resisting Wrought Steel Product (except wire).
ASTM-A-582 -	Free-Machining Stainless and Heat-Resisting Steel Bars, Hot-Rolled or Cold-Finished.

(Application for copies of ASTM publications should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pennsylvania 19103.)

AMERICAN NATIONAL STANDARDS INSITUTE, INC.

ANSI B46.1-1962 - Surface Texture.

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

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.

IEEE Standard 287 - Standard for Precision Coaxial Connectors.

(Application for copies should be addressed to the Institute of Electrical and Electronic Engineers, Inc., 345 East 47th Street, New York, NY 10017.)

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

3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheets. In the event of any conflict between requirements of this specification and the specification sheets, the latter shall govern.

3.2 Qualification. Connectors furnished under this specification shall be products which are qualified for listing on the applicable qualified products list at the time set for opening of bids (see 4.4 and 6.3).

3.3 Material. Material shall be as specified herein (see table I). If materials other than those specified are used, the contractor shall certify to the qualifying activity that the substitute material enables the connectors to meet the requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the product. When a definite material is not specified, a material shall be used which will enable the connector to meet the requirements of this specification.

TABLE I. Materials.

Component material	Applicable specification
Brass	QQ-B-613 or QQ-B-626
Copper beryllium	QQ-C-530 or QQ-C-533
Phosphor bronze	QQ-B-750
Soft copper	QQ-C-576
Copper	WW-T-799
Aluminum	QQ-A-225/6
Steel-corrosion resisting	QQ-S-763, ASTM-A-484 or ASTM-A-582
Flux	O-F-499
TFE fluorocarbon	L-P-403
FEP fluorocarbon	L-P-389
Silicon rubber	ZZ-R-765
Silver solder	QQ-B-654
Soft solder	QQ-S-571
Bronze (alloy 425)	---

3.3.1 Finish. Unless otherwise specified (see 6.2), center contacts shall be gold-plated to a minimum thickness of 0.00005-inch in accordance with MIL-G-45204, type II, Class 1. Silver shall not be used as an underplate. All other metal parts shall be finished so as to provide a connector which meets the corrosion requirements of this specification.

3.3.2 Dissimilar metals. Dissimilar metals between which an electromotive couple may exist shall not be placed in contact with each other. Reference is made to MIL-F 14072(SigC) for definition of dissimilar metals.

3.3.3 Nonmagnetic materials. All parts (except hermetic sealed connectors) shall be made from materials which are classed as nonmagnetic (see 3.8).

3.3.4 Spring members. Unless otherwise specified (see 3.1), center contact spring members shall be made of copper beryllium.

3.4 Design and construction. Connectors shall be of the design, construction and physical dimensions specified (see 3.1). On class I connectors (see 1.2.1) each half of a connector pair must be separately optimized in VSWR (see 4.6.12). It is not permitted to compensate for discontinuities of one connector by the design of the mating connector.

3.4.1 Mating (visual indication). When applicable (see 3.1), a visual means shall be provided to indicate when two mating connectors are properly mated.

3.5 Force to engage/disengage.

3.5.1 Bayonet and threaded types. When tested as specified in 4.6.2.1, the torque necessary to completely couple or uncouple the connectors shall not exceed that specified (see 3.1). Also the longitudinal force necessary to initiate the engaging or disengaging cycle shall not exceed that specified (see 3.1).

3.5.2 "Push on" connector types. When tested as specified in 4.6.2.2, the forces necessary to fully engage or disengage the connectors shall not exceed that specified (see 3.1).

3.6 Coupling proof torque. When tested as specified in 4.6.3, the coupling mechanism (threaded types) shall not be dislodged, and the connector shall meet requirements of 3.5.1. The interface dimensions of the connector shall remain as specified (see 3.1).

3.7 Mating characteristics. When connectors are tested as specified in 4.6.4, the mating dimensions shall be gaged as specified (see 3.1) and the dimensions shall remain within the specified tolerances (see 3.1).

3.8 Permeability of nonmagnetic materials. When connectors (except hermetic sealed) are tested as specified in 4.6.5, the permeability (Mu) shall be less than 2.0.

3.9 Hermetic seal (pressurized connectors). When connectors are tested as specified in 4.6.6, the leakage rate shall not exceed that specified (see 3.1).

3.10 Leakage (pressurized connectors). When connectors are tested as specified in 4.6.7, there shall be no leakage as detected by escaping air bubbles.

3.11 Insulation resistance. When connectors are tested as specified in 4.6.8, the insulation resistance shall not be less than that specified (see 3.1).

3.12 Center contact retention. When all class I connectors, and class II where applicable (see 3.1) are tested as specified in 4.6.9, the center contacts must not be displaced from the specified interface dimensions in the uncabled connector by the application of the specified axial force (see 3.1) in either direction.

3.13 Corrosion. When connectors are tested as specified in 4.6.10, there shall be no exposure of the base metal on the interface or mating surface, and they shall meet the requirements of 3.5.1 or 3.5.2 as applicable.

3.14 Voltage standing wave ratio (VSWR). When connectors are tested as specified in 4.6.11, the VSWR shall not exceed that specified over the frequency range specified (see 3.1).

3.15 Connector durability. When connectors are tested as specified in 4.6.12, they shall show no evidence of severe mechanical damage and the coupling device shall remain functional. Connectors shall meet the applicable requirements of 3.5 and 3.7.

3.16 Contact resistance. When connectors are tested as specified in 4.6.13, the contact resistance of the center contact, outer contact, and braid to connector shall be as specified (see 3.1).

3.17 Dielectric withstanding voltage. When connectors are tested as specified in 4.6.14, there shall be no evidence of breakdown.

3.18 Vibration. When the cabled (or wired, as applicable) connector is tested as specified in 4.6.15, there shall be no electrical interruptions exceeding 1 microsecond (µs), or as otherwise specified (see 3.1). There shall be no evidence of visual mechanical damage after the test, and the contact resistance of the center contact shall not be changed by more than the specified amount (see 3.1 and 3.16).

3.19 Shock (specified pulse). When the cabled (or wired, as applicable) connector is tested as specified in 4.6.16, there shall be no electrical interruptions exceeding 1 µs unless otherwise specified (3.1). There shall be no evidence of visual or mechanical damage after the test, and the contact resistance of the center contact shall not be changed by more than the specified amount (see 3.1).

3.20 Thermal shock. After testing as specified in 4.6.17, there shall be no evidence of visual mechanical damage to the connector and it shall meet the dielectric withstanding voltage requirement (see 3.17), and the contact resistance specified for the center contact shall not be exceeded (see 3.16).

3.21 Moisture resistance. When connectors are tested as specified in 4.6.18, there shall be no evidence of damage. They shall withstand the dielectric withstanding voltge specified (see 3.17), and the insulation resistance shall not be less than that specified (see 3.11).

3.22 Corona level. When connectors are tested as specified in 4.6.19, at the altitude and voltage specified (see 3.1), there shall be no evidence of sustained corona discharge.

3.23 RF high potential withstanding voltage. When connectors are tested as specified in 4.6.20, there shall be no breakdown, or the leakage current specified shall not be exceeded (see 3.1).

3.24 Cable retention force. When connectors are tested as specified in 4.6.21, there shall be no evidence of mechanical failure, loosening, rupture, or discontinuity.

3.25 Coupling mechanism retention force. When tested as specified in 4.6.22, the coupling mechanism shall not be dislodged from the connector and shall be capable of meeting the requirements of 3.5.1 immediately after the test.

3.26 RF leakage. When connectors are tested as specified in 4.6.23, the total leakage, cable to cable shall not exceed that specified (see 3.1).

3.27 RF insertion loss. When connectors are tested as specified in 4.6.24, the insertion loss shall not exceed that specified (see 3.1).

3.28 Assembly instructions. Complete assembly instructions shall be furnished by the vendor with each connector procured under this specification. Assembly instructions shall include:

a. Cable preparation - stripping dimensions and tolerances.
b. List and description of crimping or special tools if required (see 1.2.2).
c. Pictorial presentation of sub-assemblies and loss piece parts.
d. Sufficient pertinent dimensions for verification of correct parts; as a minimum the cable entry openings for conductor, dielectric, braid, and jacket shall be specified.
e. Recommended cable clamp tightening torque (if applicable).
f. Military part number and manufacturer's part number.

3.29 Marking. Connectors and associated fittings shall be permanently and legibly marked in accordance with the general marking requirements of MIL-STD-130 with the military part number (see 1.2.3) and the manufacturer's federal supply code. The marking location is optional; when practicable, a location should be picked that will least likely be covered in cable assembly or installation.

3.30 Workmanship. Connectors and associated fittings shall be processed in such a manner as to be uniform in quality and shall be free from sharp edges, burrs and other defects that will affect life, serviceability or appearance.

4. QUALITY ASSURANCE PROVISIONS

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

4.1.1 Test equipment and inspection facilities. Test and measuring equipment and inspection facilites of sufficient accuracy, quality and quantity to permit performance of the required inspection shall be established and maintained by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with MIL-STD-45662.

4.2 Classification of inspections. The inspections specified herein are classified as follows:

a. Qualification inspection (see 4.4).
b. Quality conformance inspection (see 4.5).
c. Qualification verification inspection (see 4.5.1.2.1).

4.3 Inspection conditions. Unless otherwise specified herein, all inspections shall be performed in accordance with the test conditions specified in the "GENERAL REQUIREMNTS" Of MIL-STD-202. For each test of threaded coupling connectors where the test is performed on mated pairs, the pair shall be torqued to the specified value (see 3.1).

4.4 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the Government (see 6.2) on sample units produced with equipment and procedures normally used in production.

4.4.1 Sample size. Thirty class I connectors of the same part number with its mating connector or eighteen class II connectors of the same part number with its mating connector (see 1.2.1) shall be subjected to qualification inspection.

4.4.2 Group qualification. For group qualification of all series of connectors covered by this specification, (see 3.1.). The Government reserves the right to authorize performance of any or all qualification inspection of additional types in the group that are considered necessary for qualification within each group.

4.4.3 Inspection routine. The sample shall be subjected to the inspections specified in table II. All sample units shall be subjected to the inspection of group I. The sample shall then be divided into six groups consisting of five each of class I connectors or three each of class II connectors (see 1.2.1). The sample units shall then be subjected to the inspection for their particular group.

4.4.4 Failures. One or more failures shall be cause for refusal to grant qualification approval.

4.4.5 Retention of qualification. To retain qualification, the contractor shall forward a report at 12-or 36-month intervals to the qualifying activity. The qualifying activity shall establish the initial reporting date. Initial retention of qualification shall be at a 12-month interval; subsequent retention of qualification at a 36-month interval. The report shall consist of:

(a) A summary of the results of the test performed for inspection of product for delivery, groups A and B, indicating as a minimum the number of lots that have passed and the number that have failed. The results of tests of all reworked lots shall be identified and accounted for.

(b) A summary of the results of test performed for qualification verification inspection, group C, including the number and mode of failures. The summary shall include results of all qualification verification inspection tests performed and completed during the 12-or 36-month period. If the summary of the test results indicates nonconformance with specification requirements, and corrective action acceptable to the qualifying activity has not been taken, action may be taken to remove the failing product from the qualified products list.

Failure to submit the report within 60 days after the end of each 12-or 36-month period may result in loss of qualification for the product. In addition to the periodic submission of inspection data, the contractor shall immediately notify the qualifying activity at any time during the 12-or 36-month period that the inspection data indicates failure of the qualified product to meet the requirements of this specification.

In the event that no production occured during the reporting period, a report shall be submitted certifying that the company still has the capabilities and facilities necessary to produce the item. If during 3 consecutive reporting periods there has been no production, the manufacturer may be required, at the discretion of the qualifying activity, to submit a representative product from each group, as defined by 4.4.2 to testing in accordance with the qualification inspection requirements.

TABLE II. Qualification inspection.

Examination or test	Requirement paragraph	Method paragraph
Group I		
Visual and mechanical examination		
Material	3.3	4.6.1
Finish	3.3.1	
Dissimilar metals	3.3.2	
Design and construction (dimensions)	3.4	4.6.1.1
Marking	3.29	4.6.1
Mating (visual indication)	3.4.2	
Force to engage/disengage		
Bayonet and threaded types	3.5.1	4.6.2.1
Push-on connector types	3.5.2	4.6.2.2
Coupling proof torque	3.6	4.6.3
Mating characteristics	3.7	4.6.4
Permeability of nonmagnetic materials	3.8	4.6.5
Workmanship	3.30	4.6.1
Hermetic seal (pressurized connectors only)	3.9	4.6.6
Leakage (pressurized connectors only)	3.10	4.6.7
Insulation resistance	3.11	4.6.8
Group II		
Center contact retention	3.12	4.6.9
Corrosion	3.13	4.6.10
Group III		
Voltage standing-wave ratio	3.14	4.6.11
Connector durability	3.15	4.6.12
Group IV		
Center contact resistance	3.16	4.6.13
Dielectric withstanding voltage	3.17	4.6.14
Vibration	3.18	4.6.15
Shock (specified pulse)	3.19	4.6.16
Thermal shock	3.20	4.6.17
Moisture resistance	3.21	4.6.18
Corona level	3.22	4.6.19
RF high potential withstanding voltage	3.23	4.6.20
Cable retention forces	3.24	4.6.21
Coupling mechanism retention force	3.25	4.6.22
Group V		
RF leakage	3.26	4.6.23
Group VI		
RF insertion loss	3.27	4.6.24
Group VII		
Contact resistance	3.16	4.6.13

4.5 Quality conformance inspection.

4.5.1 Inspection of product for delivery. Inspection of product of delivery shall consist of groups A and B inspection.

4.5.1.1 Inspection lot. An inspection lot shall consist of all the connectors and associated fittings comprised of identical piece parts produced under essentially the same conditions and offered for inspection at one time.

4.5.1.1.1 Group A inspection. Group A inspection shall consist of the inspections specified in table III, and shall be made on the same set of sample units, in the order shown.

TABLE III. Group A inspection.

Inspection	Requirement paragraph	Method paragraph	AQL (percent defective)	
			Major	Minor
Visual and mechanical examination				
Material	3.3			
Finish 1/	3.3.1			
Dissimilar metals	3.3.2			2.5
Design and construction	3.4	4.6.1		
Marking	3.29		.65	
Workmanship	3.30			
Mating (visual indication)	3.4.1			
Dielectric withstanding voltage	3.17	4.6.14		
Hermetic seal (pressurized connectors only)	3.9	4.6.6		---
Leakage (pressurized connectors only)	3.10	4.6.7		

1/ Verification of finish may be accomplished using the manufacturer's process controls providing these controls are clearly equal to or more stringent than the requirements of this specification.

4.5.1.1.1.1 Sampling plan. Statistical sampling and inspection shall be in accordance with MIL-STD-105 for general inspection level II. The acceptable quality level (AQL) shall be as specified in table III. Major and minor defects shall be as defined in MIL-STD-105.

4.5.1.1.1.2 Rejected lots. If an inspection lot is rejected, the manufacturer may rework it to correct the defects, or screen out the defective units and resubmit for reinspection. Resubmitted lots shall be inspected using tightened inspection. Such lots shall be separate from new lots and shall be clearly identified as reinspected lots.

4.5.1.1.2 Group B inspection. Group B inspection shall consist of the inspections specified in table IV in the order shown, and shall be made on sample units which have been subjected to and passed the group A inspection. Connectors having identical piece parts may be combined for lot purposes and shall be in proportion to the quantity of each part-numbered connector produced.

4.5.1.1.2.1 Sampling plan. The sampling plan shall be in accordance with MIL-STD-105 for special inspection level S-4. The sample size shall be based on the inspection lot size from which the sample was selected for group A inspection. The AQL shall be 2.5 percent defective.

TABLE IV. Group B inspection.

Inspection	Requirement paragraph	Method paragraph
Force to engage/disengage		
Bayonet and threaded type	3.5.1	4.6.2.1
Push-on connector type	3.5.2	4.6.2.2
Coupling proof torque	3.6	4.6.3
Mating characteristics	3.7	4.6.4
Permeability of nonmagnetic material	3.8	4.6.5
Insulation resistance	3.11	4.6.8
Voltage standing-wave ratio (uncabled)	3.14	4.6.11

4.5.1.1.2.2 Rejected lots. If an inspection lot is rejected, the manufacturer may rework it to correct the defects, or screen out the defective units, and resubmit for reinspection. Resubmitted lots shall be inspected using tightened inspection. Such lots shall be separate from new lots, and shall be clearly identified as reinspected lots.

4.5.1.1.2.3 Disposition of sample units. Sample units which have passed all the group B inspection may be delivered on the contract or purchase order, if the lot is accepted. Any connector or connector part deformed or otherwise damaged during testing shall not be delivered on the contract or order.

4.5.1.2 Qualification verification inspection. Qualification verification inspection shall consist of group C. Except where the results of these inspections shown noncompliance with the applicable requirements (see 4.5.1.2.1.4), delivery of products which have passed groups A and B shall not be delayed pending the results of these qualification verification inspections.

4.5.1.2.1 Group C inspection. Group C inspection shall consist of the inspections specified in table V, in the order shown. Group C inspection shall be made on sample units selected from inspection lots which have passed the groups A and B inspection.

4.5.1.2.1.1 Sampling plan. Group C inspection shall be performed on connectors of the same part number with their mating connectors 1 year after initial qualification and within each 3 year period thereafter. Twelve sample units shall be selected from the first lot produced. Twelve sample units shall also be selected after 200,000 connectors have been produced. The sample units shall be divided equally among the six subgroups.

4.5.1.2.1.2 Failures. If one or more sample units fails to pass group C inspection, the sample shall be considered to have failed.

4.5.1.2.1.3 Disposition of sample units. Sample units which have been subjected to group C inspection shall not be delivered on the contract or order.

4.5.1.2.1 Noncompliance. If a sample fails to pass group C inspection, the manufacturer shall notify the qualifying activity and the cognizant inspection activity of such failure and take corrective action on the materials or processes, or both, as warranted, and on all units of product which can be corrected and which are manufactured under essentially the same materials and processes, and which are considered subjected to the the same failure. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the qualifying activity has been taken. After the corrective action has been taken group C inspection shall be repeated on additional sample units (all tests and examinations, or the test which the original sample failed, at the option of the qualifying activity). Groups A and B inspections may be reinstituted; however, final acceptance and shipment shall be withheld until the group C inspection has shown that the corrective action was successful. In the event of failure after reinspection, information concerning the failure shall be furnished to the cognizant inspection activity and the qualifying activity.

TABLE V. Group C inspection.

Inspection	Requirement paragraph	Method paragraph
Subgroup 1		
Center contact retention	3.12	4.6.9
Corrosion	3.13	4.6.10
Subgroup 2		
Voltage standing-wave ratio (cabled)	3.14	4.6.11
Connector durability	3.15	4.6.12
Subgroup 3		
Center contact resistance	3.16	4.6.13
Vibration	3.18	4.6.15
Shock (specified pulse)	3.19	4.6.16
Thermal shock	3.20	4.6.17
Moisture resistance	3.21	4.6.18
Corona level	3.22	4.6.19
RF high potential withstanding voltage	3.23	4.6.20
Cable retention forces	3.24	4.6.21
Coupling mechanism retention force	3.25	4.6.22
Subgroup 4		
RF leakage	3.26	4.6.23
Subgroup 5		
RF insertion loss	3.27	4.6.24
Subgroup 6		
Contact resistance	3.16	4.6.13

4.5.2 Inspection of packaging. The sampling and inspection of the preservation, packing, and container marking shall be in accordance with the requirements of MIL-C-55330.

4.6 Methods of examination and test.

4.6.1 Visual and mechanical examination. Connectors and associated fittings shall be examined to verify that the design, construction, physical dimensions, assembly instructions, marking and workmanship are in accordance with the applicable requirements (see 3.1, 3.3, 3.4, 3.28, 3.29, and 3.30).

4.6.1.1 Dimensional examination. Mating dimensions shall be examined by mating the connector with its applicable mating gages or other suitable means acceptable to the Government.

NOTE: The documents listed in supplement 1 show the overall dimensions of the connector when assembled to the appropriate cable, and the detail mating dimentions at the interface. No other dimensions or details will be shown. The cable-end construction and other dimensions are controlled by performance requirements of the specification, i.e., cable retention, VSWR, RF leakage, etc., with cable in place.

4.6.2 Force to engage/disengage.

4.6.2.1 Bayonet and threaded types (see 3.5.1). The connector shall be engaged with its mating standard part (see 3.1). During the entire coupling/uncoupling cycle (until the connector is fully engaged/disengaged) the forces and/or torques necessary shall not exceed those specified (see 3.1). A thread coupled connector is fully engaged with its mating standard part when their reference planes (see 3.1) coincide. A bayonet coupled connector is fully engaged with its mating standard part when the bayonet studs have passed the detent and their reference planes coincide. No additional tightening torque shall be applied. The mating s' ndard part is a steel jig containing the critical interface dimensions finished to the tolerances specified (see 3.1). Its spring members when applicable shall be heat treated beryllium copper. The surface finish or mating surfaces shall be 16 microinches rms maximum, per ANSI B46.1-1962.

4.6.2.2 "Push-on" connector types (see 3.5.2). The connector under test shall be engaged with its standard mating part (gage). During this engaging cycle the force necessary to fully engage the connectors shall not exceed that specified (see 3.1). Upon completion of engagement, an opposite force necessary for disengagement shall be applied. This force shall be within the limits specified, and shall include any unlatching forces required.

4.6.3 Coupling proof torque (see 3.6). The connector under test shall be engaged with its mating standard part (gage) and the coupling nut tightened to the torque value specified (see 3.1). After one minute the connector under test and its mating standard part shall be disengaged.

4.6.4 Mating characteristics (see 3.7). After insertion of the specified oversize pin the specified number of times (see 3.1), the contact to be tested shall be held rigid by means of a suitable jig or fixture. A gage containing the test pin or test ring and a suitable force indicating dial shall be aligned to within 0.004 TIR of any plane passing through the axis of the contact under test. Engagement or withdrawal of the test pin or test ring shall be made smoothly and at such a rate that the dial does not bounce or otherwise give a false reading. The test pin or test ring may be chamfered to facilitate entry, but the specified engagement length shall not include the chamfer length and the finish shall be as specified and in accordance with ANSI B46.1-1962.

4.6.5 Permeability of nonmagnetic materials (see 3.8). The permeability of the connector shall be measured with an indicator conforming to MIL-I-17214.

4.6.6 Hermetic seal (see 3.9). Connectors shall be tested in accordance with method 112, MIL-STD-202. The following details shall apply:

a. Test condition letter - C.
b. Procedure number - III.
c. Leakage rate sensitivity - 10^{-8} cubic centimeters per second.

4.6.7 Leakage (pressurized) (see 3.10). Connectors shall be subjected to air pressure specified (see 3.1) applied to one end, and the whole assembly immersed in water at a temperature of 15° to 25°C. the connector shall remain immersed for at least 2 minutes.

4.6.8 Insulation resistance (see 3.11). Connectors without cables (when applicable) shall be tested in accordance with method 302, test condition B, MIL-STD-202. Measure between the center contact and body.

4.6.9 Center contact retention (see 3.12). An axial force (see 3.1) shall be applied, first in one direction and then the other, to the center contact of an assembled and uncabled connector utilizing a method and force measuring device suitable to the Government. The inner contact shall be inspected after the force has been applied in one direction and again after the force has been applied in the opposite direction to determine if the contact has been displaced from the specified interface dimensions.

4.6.10 Corrosion (see 3.13). Unmated and uncabled connectors shall be tested in accordance with method 101, MIL-STD-202. The following details and exceptions shall apply:

a. Test condition letter (see 3.1).
b. Salt solution - 5 percent.

After exposure, connectors shall be washed, shaken and lightly brushed as specified in method 101 of MIL-STD-202 and then permitted to dry for 24 hours at 40°C. Connectors shall then be examined for evidence of corrosion, pitting, and ease of coupling.

4.6.11 Voltage standing wave ratio (VSWR) (see 3.14). The VSWR shall be measured in accordance with the following procedure or a method acceptable to the Government. In the event of dispute the method outlined herein shall be used. Diagrams for the swept frequency VSWR system check out and measurement procedures are shown on figure 1.

In the basic measurement setup of figure 1 detector 1 provides a feedback signal to the swept RF source in order to normalized the output signal of detector 2. The frequency-amplitude characteristics of detectors 1 and 2 should be matched within 0.5 dB.

To measure VSWR several sweeps are made with the slotted line probe incrementally positioned over at least a half wave length at the lowest frequency of interest. In this manner an X-Y display is generated whose upper and lower envelope limits represent maximum and minimum ampltiudes of the standing wave for each frequency in the test band. A base line may be generated by making a sweep with no input to the measurement channel amplifier. The resultant X-Y display is calibrated according to the characteristics of the measurement channel detector and amplifier, e.g., linear, square law, logarithmic, etc.

The VSWR test system is checked out by successively terminating the slotted line with the elements shown in steps 1 and 2 and sweeping the frequency over the specified test band (see 3.1). In step 1 the system VSWR shall be less than 1.02 +.004 F (F measured in GHz). In step 2 the system VSWR shall be as specified (see 3.1).

For qualification and group C inspection (see tables II and V), the system is checked out with the slotted line terminated as in step 3 using the specified cable (see 3.1). The impedance variation (random and/or periodic) from the nominal characteristic impedance specified for the selected test cable should be no more than 1.0 percent when tested by time domain reflectometry. In step 3 the system VSWR shall be as specified (see 3.1). For qualification and group C inspection the connector under test is measured with the slotted line terminated as in step 4. The VSWR shall be as specified (3.1).

Group B inspection tests (see table IV) are performed with the slotted line terminated as shown in step 7. The input part of the cable simulator must have the same interface configuration, dimensions, and dielectric as the recommended cable interface for the connector under test. The cable simulator for group B inspection tests must meet the specified VSWR (see 3.1) when tested as shown in step 6.

The standard precision adapter interface shall conform to IEEE Standard 287. Item 6 (standard precision adapters) shall not exceed the specified VSWR requirements (see 3.1). Standard test adapter designs shall be approved by the military qualifying agency.

4.6.12 Connector durability (see 3.15). Each connector under test shall be mated with a typical production connector per this specification. The connector shall be subjected to the number of cycles of mating and unmating specified (see 3.1). The connector and its mating part shall be completely engaged and completely disengaged during this cycle. Lubrication of the threads or rotational parts shall not be employed for this test unless specified (see 3.1). It is permissible to shake or blow debris from the threads or interface surfaces at intervals of not less than 50 cycles. Solvents or tools shall not be used for cleaning.

4.6.13 Contact resistance (see 3.16). All contact resistance tests shall be conducted with the apparatus shown in figure 2. Circuit adjustments and the measurement procedures for all contact resistance tests shall be in accordance with 4.6.13.1. The contact resistance to be measured are:

a. The contact resistance between the cable braid or outer conductor and the connector at the point of contact.
b. The contact resistance of the mated outer conductor contacts (the coupling nut must be removed for this measurement).
c. The contact resistance of the mated inner conductor contacts.

4.6.13.1 General procedure. The apparatus shall be assembled as shown in figure 2. The contacts, C_1 - C_2, shown in the figure represent the mating contacts upon which millivolt drop tests are to be conducted.

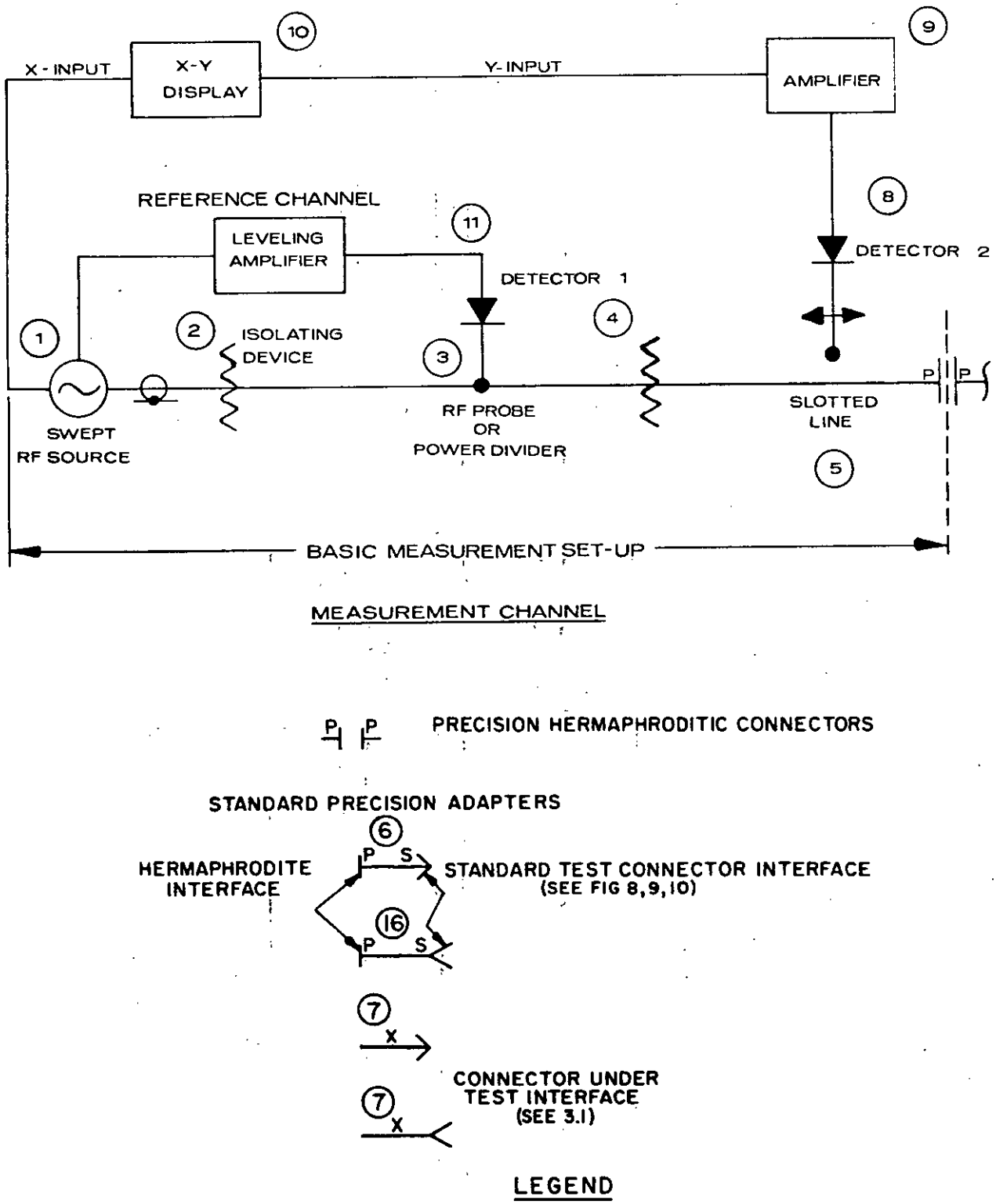
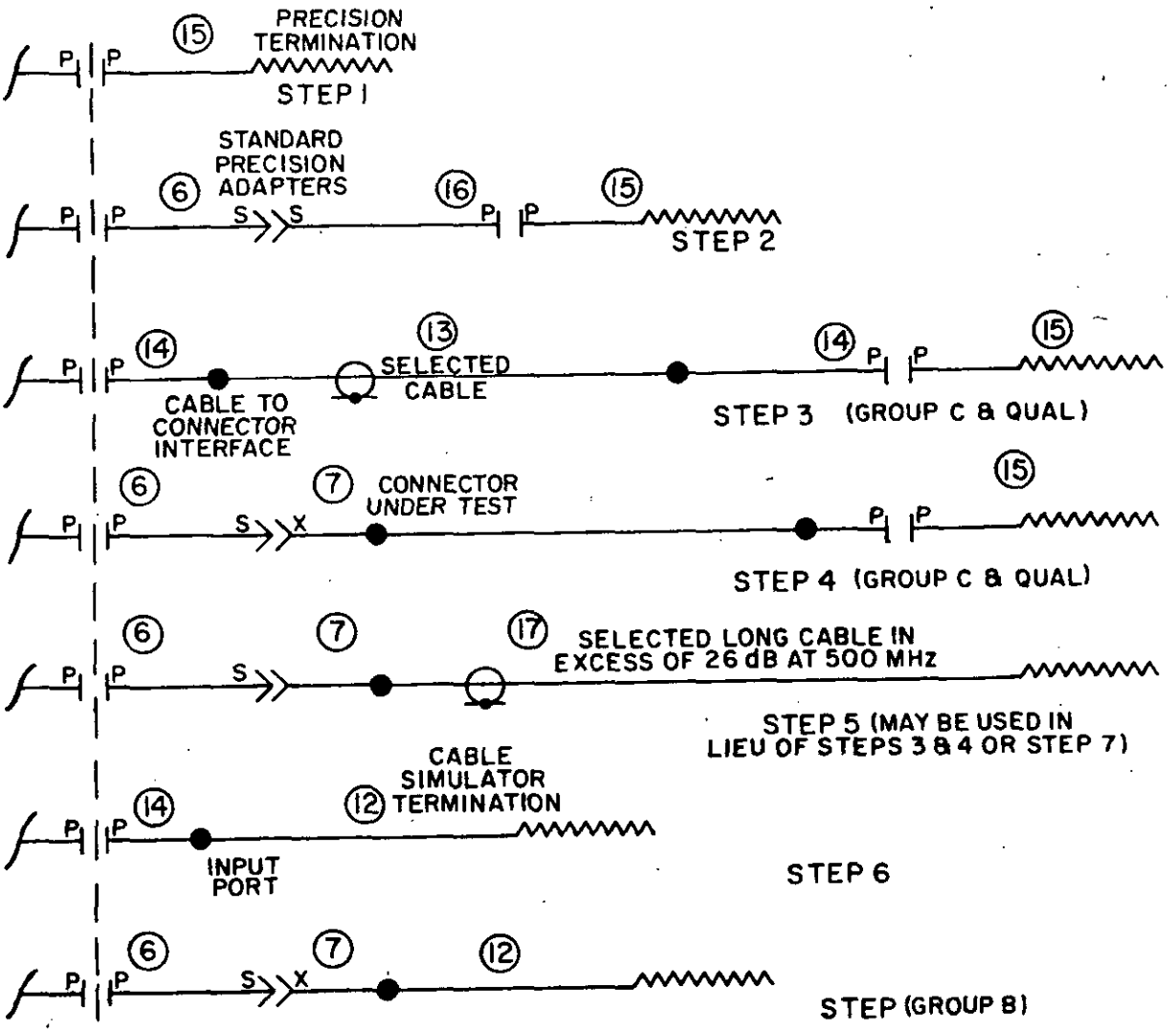


FIGURE 1. Swept frequency VSWR test.



① SWEPT RF SOURCE
② ISOLATING DEVICE
③ RF PROBE OR POWER DIVIDER
④ ISOLATING DEVICE
⑤ SLOTTED LINE WITH PRECISION HERMAPHRODITIC OUTPUT CONNECTOR. RESIDUAL VSWR LESS THAN 1.006 + .003F (F in GHz).
⑥ STANDARD PRECISION ADAPTER MAXIMUM VSWR (see 3.1).
⑦ CONNECTOR UNDER TEST
⑧ DETECTOR NO. 2
⑨ AMPLIFIER
⑩ X-Y DISPLAY
⑪ DETECTOR NO. 1
⑫ CABLE SIMULATOR TERMINATION
⑬ SELECTED TEST CABLE FOR GROUP C AND QUALIFICATION TESTS
⑭ PRECISION HERMAPHRODITIC CABLE CONNECTOR
⑮ PRECISION HERMAPHRODITIC TERMINATION
⑯ STANDARD PRECISION ADAPTORS
⑰ SELECTED LONG CABLE WHOSE ATTENUATION AT THE LOWEST TEST FREQUENCY IS 26 dB MINIMUM (see 3.1).

FIGURE 1. Swept frequency VSWR test - Continued.

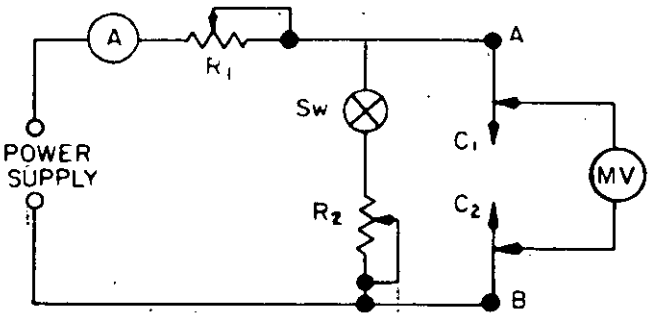


FIGURE 2. Diagram for contact resistance.

a. Remove contacts C_1 - C_2 from the measuring circuit.
b. Close switch SW.
c. Adjust R_2 for a millivoltmeter (mVm) reading of 50 millivolts.
d. Connect contacts C_1 - C_2 to the measuring circuit and mate.
e. Check to see that mVm drops significantly prior to opening switch in (f).
f. Open switch SW.
g. Adjust R_1 for a circuit current (A) of one ampere.
h. Measure the millivolt drop across contacts C_1 - C_2 and call this "e."
i. Compute contact resistance. Contact resistance (milliohms) = e millivolts ÷ one ampere.

4.6.14 Dielectric withstanding voltage (see 3.17). Connectors shall be tested in accordance with method 301 of MIL-STD-202. The following details shall apply:

a. Special preparations or conditions.
   (1) The maximum relative humidity shall be 50 percent. When facilities are not available at this test condition, connectors shall be tested at room ambient relative humidity. In case of dispute, if the test has been made at room ambient relative humidity, retest shall be made at 50 percent maximum relative humidity.
   (2) The center contact of plug connectors and receptacle connectors shall be positioned in such a manner as to simulate actual assembly conditions.
   (3) Precautions shall be taken to prevent air-gap voltage breakdowns.
   (4) The voltage shall be metered on the high side of the transformer.
b. Magnitude of test voltage (see 3.1). The voltage shall be instantaneously applied.
c. Nature of potential - Alternating current.
d. Points of application of test voltage - Between the center contact and body.

4.6.15 Vibration (see 3.18). A complete connector assembly shall be mounted as shown on figure 3 and vibrated in accordance with test condition B, method 204, MIL-STD-202. The center and outer contacts shall be connected to a suitable monitoring device. Suitable coaxial cable or wire as applicable, using the normal connecting devices of the connector and clamped as shown in figure 3, shall be used. At least 100 milliamperes shall be flowing through each set of contacts. Contacts may be connected in series. The connector shall be mounted by its normal mounting device and engaged by its normal coupling device. No safety wire shall be used. Cable to cable connectors may be held to the jig of figure 3 by a suitable clamp on one half of the connector assembly. The following conditions shall apply:

a. Test condition letter (see 3.1).
b. Continuity shall be monitored during vibration with a detector capable of detecting interruptions of 1 μs duration or longer, or as specified at 100 milliamperes.

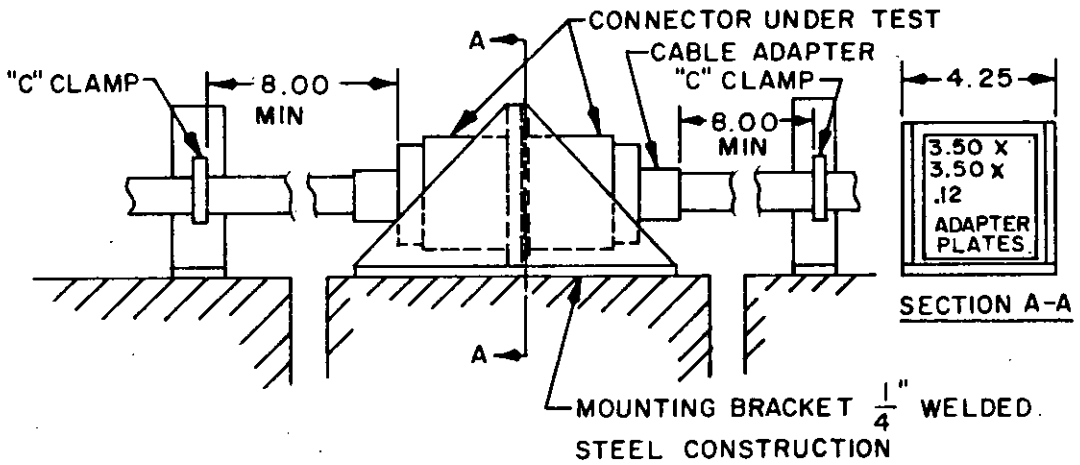


FIGURE 3. Vibration testing set-up.

4.6.16 Shock (specified pulse) (see 3.19). The connector shall be mated with its mating connector (see 3.1) and subjected to method 213 of MIL-STD-202. The following exceptions and details shall apply:

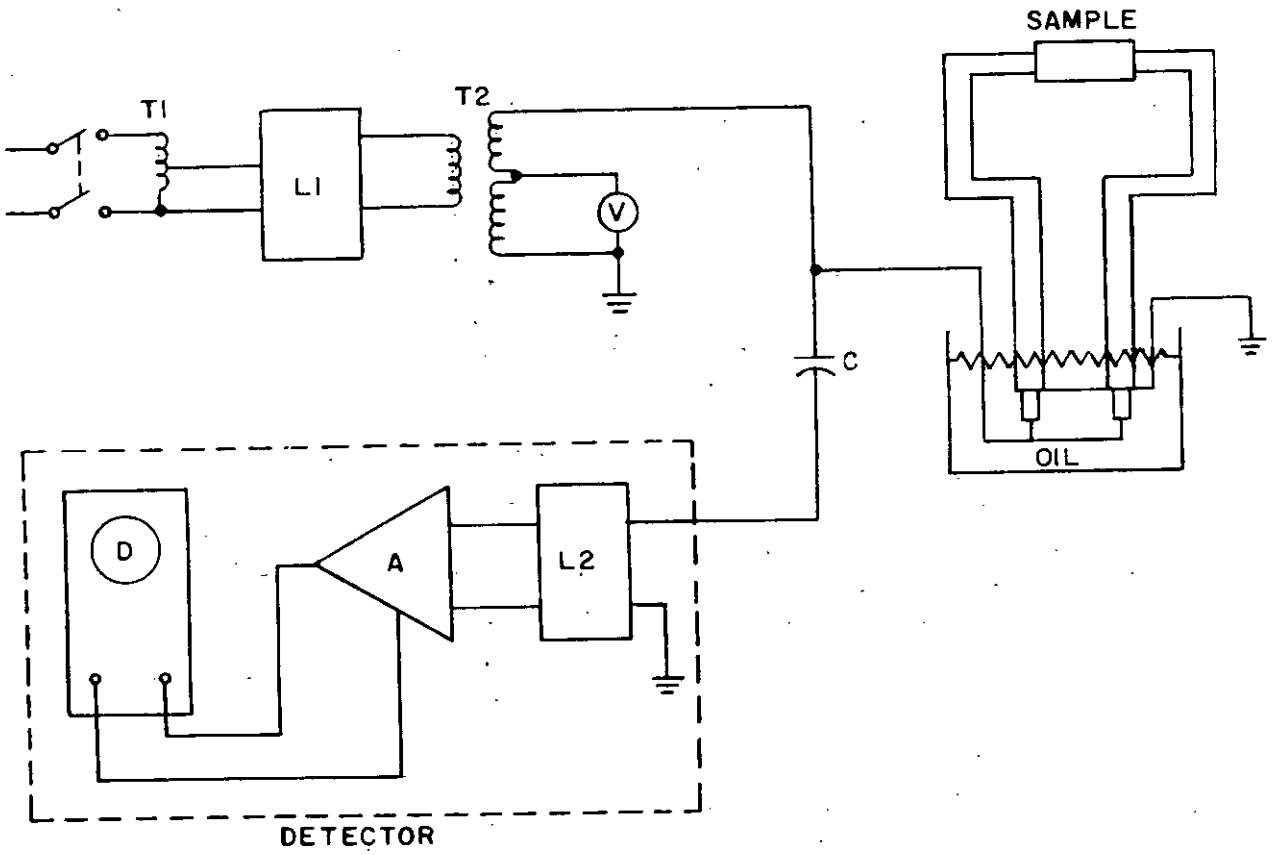
a. Receptacles and panel or bulkhead mounted connectors and adapters shall be mounted by normal means. All other connectors and adapters shall be rigidly clamped to the vibration table.
b. Acceleration requirements (see 3.1).
c. Three blows in each of three mutually perpendicular planes; one of which shall be parallel to the axis of the connector.
d. Continuity shall be monitored during shock as specified in 4.6.15(b).
e. Center contact resistance shall be measured in accordance with 4.6.13 after the shock test.

4.6.17 Thermal shock (see 3.20). Connectors shall be subjected to method 107 of MIL-STD-202. The following details shall apply:

a. Test condition letter (see 3.1).
b. The contact resistance tests on the center contact shall be performed before and after the thermal shock test and examined for mechanical damage (see 3.1).

4.6.18 Moisture resistance (see 3.21). The connector shall be mated and cabled with its mating connector and shall be subjected to method 106, MIL-STD-202. The following exceptions and conditions shall apply:

a. No initial measurements.
b. No load.
c. Step 7b (vibration) shall be omitted.
d. Measurements shall be made at high humidity when specified (see 3.1).
e. The connector shall withstand the dielectric withstanding voltage specified (see 2.6.14) after the drying period.



C - Corona Free Coupling Capacitor (Note 1)
D - Discharge Display
L1 - Input Line Filter (Note 2)
L2 - 10-50 KHz Detector Input Filter
A - Detector Amplifier
T1 - 0-130 V Variable Transformer
T2 - High Voltage Transformer (Corona Free - less than 5 picocoulombs)
V - Voltmeter

Note 1: Equal to or greater than total circuit capacitance
2: 100 dB 14 KHz to 10 KMHz

FIGURE 4. Equipment and schematic for measuring corona level.

4.6.19 Corona level (see 3.22). The test sample shall be connected to a mating connector and arranged in a suitable test circuit such as indicated in figure 4. Components of the test circuit shall be corona free to the extent that a discharge of five pico coulombs or less can be measured when the 60 Hz test potential is increased to the value specified at the reduced pressure specified (see 3.1). The type of cable and length of cable used shall be as specified (see 3.1). No grease or similar compounds shall be used in or on the test item. After the sample is purged of air, the 60 Hz voltage shall be slowly increased until the detector, operated at a sensitivity of five pico coulombs, indicates a sustained corona discharge. The voltage shall then be decreased until corona is at the five pico coulombs level or less. The latter value is being the corona level of the connector under test. The contractor may, at his own option, use a corona detector (which has been approved by the Government) for performing the test in lieu of the test set up of figure 4.

4.6.20 RF high potential withstanding voltage (see 3.23). Connectors shall be mated with their mating connectors (see 3.1) and approximately 2 inches of their standard cable (see 3.1) appropriately attached. This assembly shall then be inserted into the high impedance circuit as shown in figure 5, or equivalent, and instantaneously subjected to the RF voltage and frequency specified (see 3.1) between the center contact and body of the connectors. The duration of the test shall be 1 minute. The RF voltage source shall be frequency stabilized and have an approximate pure sine wave output with minimum harmonic content. Means shall be provided to indicate disruptive discharge and leakage current. The maximum leakage current shall be as specified (see 3.1).

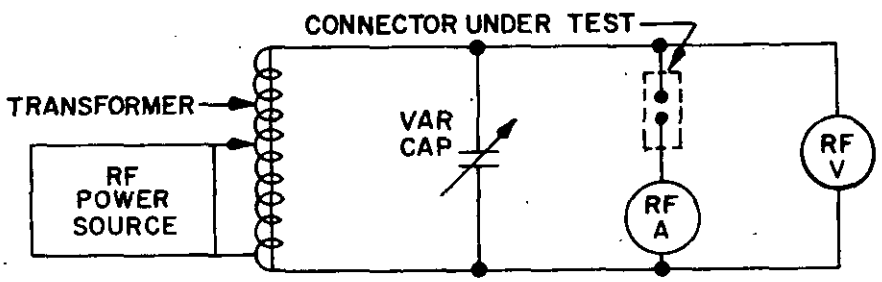


FIGURE 5. Circuit diagram for RF high potential withstanding voltage.

4.6.21 Cable retention force (see 3.24). When applicable (see 3.1), the connector shall be assembled to its standard mating test cable. The connector shall be firmly fixed and a movable sleeve attached to the cable. The sleeve is then moved longitudinally away from the fixed connector gradually and in such a manner that the cable remains unbent and untwisted. A scale for measuring the retention force (see 3.1) shall be attached to the sleeve. The force shall be held for 30 seconds minimum. The assembly shall then be examined for mechanical failure, loosening, or rupture and tested for continuity with a simple 115 volt, 60 Hz ac lamp circuit. With the connector still in the fixed position, the cable shall be held at a point ten times the diameter of the cable from the connector and a torque shall be applied in both directions as specified (see 3.1). The cable shall then be bent at a radius of 10 times the diameter of the cable starting at the connector at an angle of 90° ±5° from the axis of the connector, then reversed 180° ±10°. Repeat this procedure four times, then retest and reexamine as outlined above.

4.6.22 Coupling mechanism retention forces (see 3.25). The connector body and coupling mechanism shall be respectively secured to the lower and upper jaws of a tensile tester in an appropriate manner. A tensile load shall be applied at a rate of approximately 100 pounds/minute up to the force as specified and held at that value for one minute (see 3.1). During the one minute of steadily applied force, the coupling mechanism shall be rotated with respect to the connector body, two full revolutions in each direction.

4.6.23 RF leakage (see 3.26). The mating connector pair to be tested shall be assembled as shown on figure 6A and tested as shown on figure 6B. (The procedure for determining the dimensions of the cavity on figure 6B may be found in paragraph 30 of the appendix. The close fitting brass tubing shall be machined to thread into connector in lieu of compression nut (see 3.1). This test setup between 500 MHz and 11 GHz, shall have a dynamic range from -20 dBm to better than -100 dBm or a difference of 90 dB. Using +20 dBm RF source with 10 dB isolation, an additional 30 dB range can be obtained by use of attenuator pads or a step attenuator producing a total range of 120 dB. The shorting plunger is adjusted to produce a maximum reading in the detector with the triaxial assembly inserted. The insertion loss caused by the insertion of the triaxial assembly adjusted as shown in a measure of the total leakage of the mated connector pair both at its interface as well as at the clamping points to both cables.

Reference: "RF Leakage Characteristics of Popular Coaxial Cables and Connectors, 500 MS to 7.5 Gc", by J. Zorzy and RF Muehlberger, in the Microwave Journal, November 1961, pp 80-86.

4.6.24 RF insertion loss (see 3.27). The connector shall be tested as shown on figure 7. Insertion loss of a mated connector pair is defined as the increase of a loss due to insertion of a mated connector pair in a cable; this includes the reflection losses to the cable and the dissipating losses in the pair. First insert cable assembly number 1 and tune out its input VSWR by means of tuner number 4 and balance setup. Then insert the cable assembly number 2 which includes the connector pair under test. With tuner number 4 in the same position and the electrical length of the cable assembly the same as that of number 1, record increase of insertion loss; add to this as a correction the cable loss of the removed section due to the length $\Delta L_1 + \Delta L_2$ at this frequency. The sum of the increase and the correction is the insertion loss of the connector pair.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-C-55330.

6. NOTES

6.1 Intended use. Connectors and fittings covered by this specification are intended for use in radiofrequency application up to the frequency specified (see 3.1).

6.2 Ordering data. Acquisition documents shall specify the following:

a. Title, number and date of this specification.
b. Title, number and date of the applicable detail specification.
c. The complete part number of the connector or fitting ordered.
d. Levels of preservation-packaging and packing and applicable marking (see section 5).
e. Specific finish when required (see 3.3.1).
f. For category B connectors, the special tools which are to be used in the assembly of the connectors.

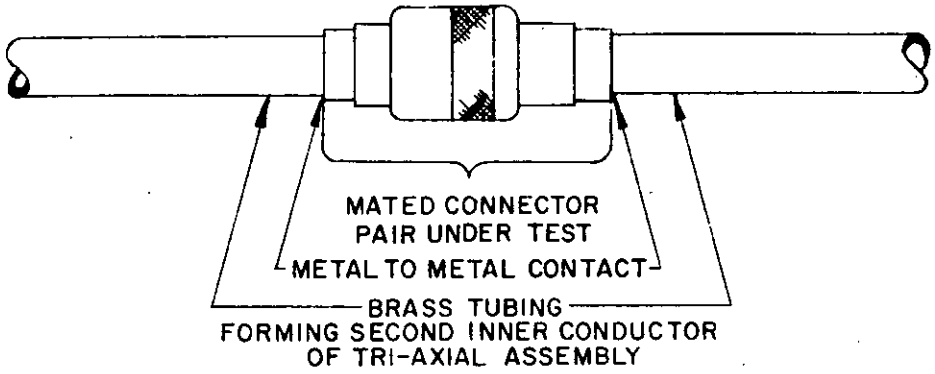


FIGURE 6A. Connector assembly for RF leakage test.

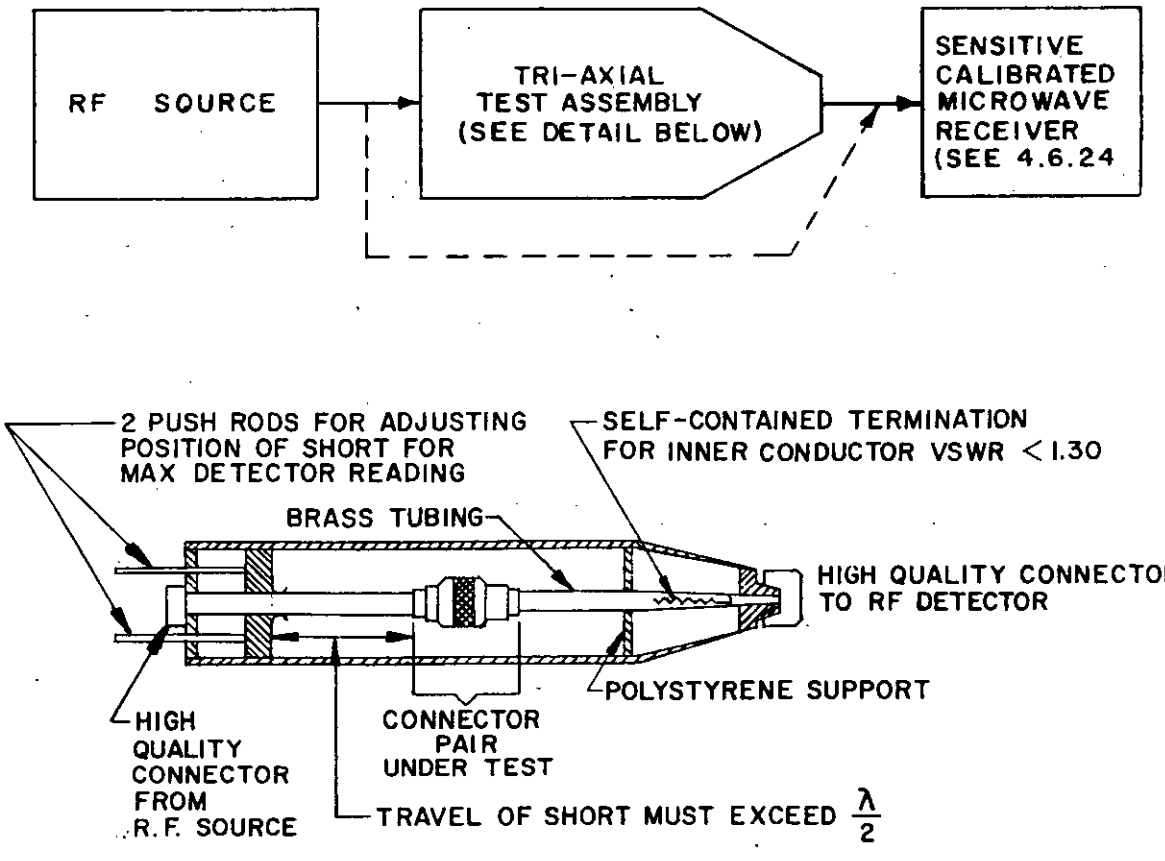


FIGURE 6B. RF leakage test set-up.

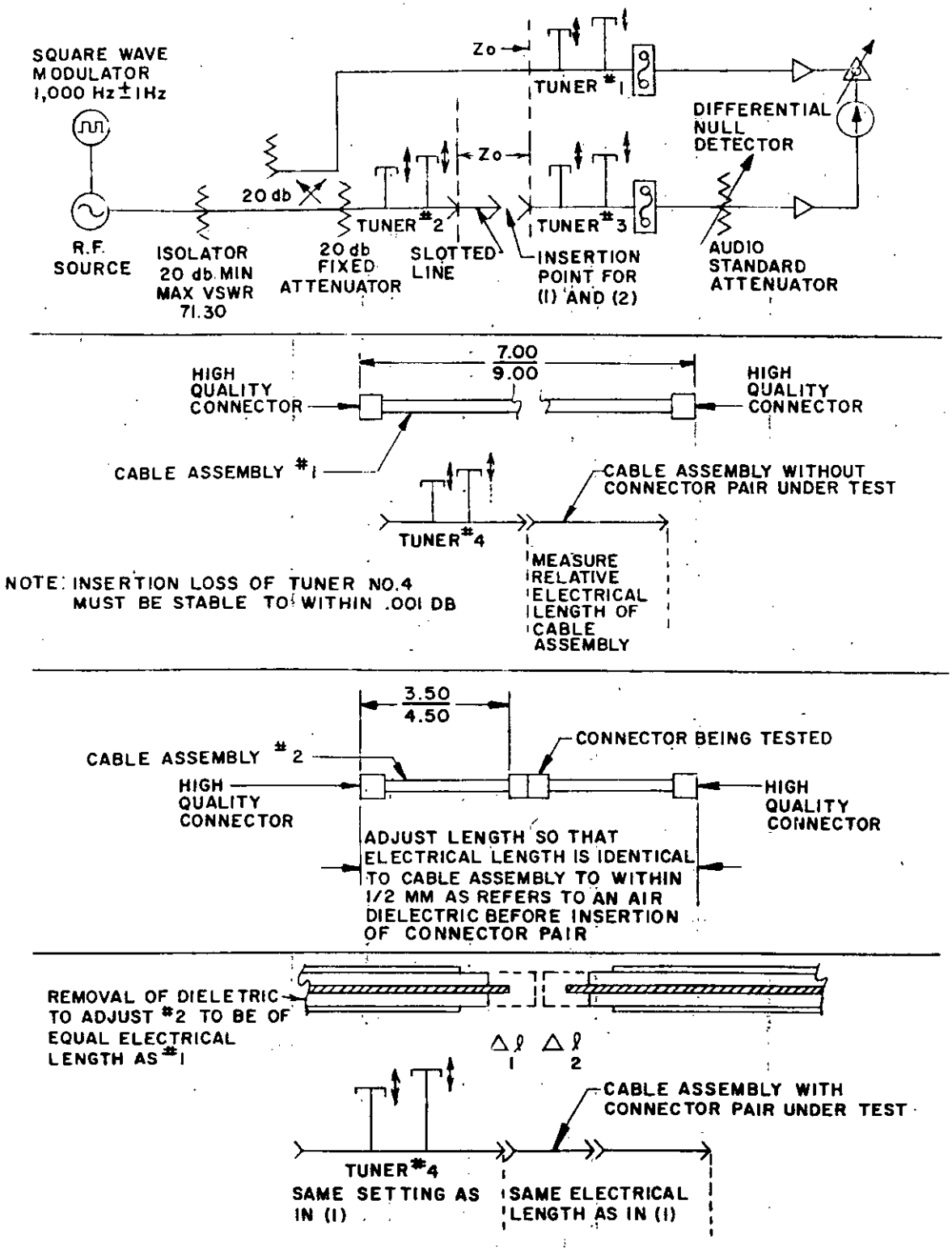


FIGURE 7. Method of insertion loss measurement of mated connector pair.

TABLE VI. Cross reference.

Superseded part M39012/	Superseding part M39012/	Superseded part M39012/	Superseding part M39012/
01-0001	01-0101	35-0002	35-0017
01-0002	01-0005	35-0003	35-0018
01-0003	01-0015	35-0004	35-0019
01-0004	01-0104	35-0005	35-0020
01-0025	01-0125	35-0015	35-0021
02-0001	02-0101	36-0001	36-0015
02-0002	02-0003	36-0002	36-0016
02-0004	02-0104	36-0012	36-0018
02-0005	02-0006	36-0013	36-0019
02-0031	02-0131	36-0014	36-0020
02-0032	02-0132	36-0011	36-0017
03-0001	03-0101	38-0001	38-0010
03-0002	03-0012	38-0002	38-0011
05-0001	05-0101	38-0009	38-0012
16-0001	16-0101	39-0001	39-0101
16-0002	16-0102	39-0006	39-0106
16-0003	16-0103	39-0007	39-0107
16-0011	16-0111	40-0001	40-0023
16-0018	16-0118	40-0002	40-0024
17-0001	17-0101	40-0003	40-0025
17-0002	17-0102	40-0004	40-0026
17-0003	17-0103	40-0005	40-0027
17-0011	17-0111	55-3001	55-3006
17-0018	17-0118	55-4001	44-4006
18-0001	18-0101	55-3002	55-3007
18-0002	18-0102	55-4002	55-4007
18-0003	18-0103	55-3003	55-3008
18-0011	18-0111	55-4003	55-4008
18-0018	18-0118	55-3004	55-3009
19-0001	19-0101	55-4004	55-4009
19-0002	19-0102	55-3005	55-3010
19-0010	19-0110	55-4005	55-4010
19-0011	19-0001	56-3001	56-3006
19-0018	19-0118	56-4001	56-4006
20-0001	20-0101	56-3002	56-3007
20-0008	20-0108	56-4002	56-4007
26-0001	26-0101	56-3003	56-3008
26-0002	26-0102	56-4003	56-4008
26-0003	26-0103	56-3004	56-3009
26-0004	26-0104	56-4004	56-4009
26-0017	26-0117	56-3005	56-3010
27-0001	27-0101	56-4005	56-4010
27-0003	27-0103	57-3001	57-3006
27-0004	27-0104	57-4001	57-4006
27-0017	27-0117	57-3002	57-3007
28-0001	28-0101	57-4002	57-4007
28-0002	28-0102	57-3003	57-3008
28-0003	28-0103	57-4003	57-4008
28-0004	28-0104	57-3004	57-3009
28-0017	28-0117	57-4004	57-4009
29-0001	29-0101	57-3005	57-3010
29-0002	29-0102	57-4005	57-4010
29-0003	29-0103	57-3001	57-3006
29-0004	29-0104	58-4001	58-4006
29-0017	29-0117	58-3002	58-3007
30-0001	30-0101	58-4002	58-4007
30-0002	30-0102	58-3003	58-3008
30-0003	30-0103	58-4003	58-4008
30-0004	30-0104	58-3004	58-3009
30-0017	30-0117	58-4004	58-4009
30-0018	30-0118	58-3005	58-3010
35-0001	35-0016	58-4005	58-4010

TABLE VI. Cross reference - Continued.

Superseded part M39012/	Superseding part M39012/	Superseded part M39012/	Superseding part M39012/
59-3001	59-3006	UG-1094/U	21-0002
59-4001	59-4006	UG-1098/U	23-0001
59-3002	59-3007	UG-1174/U	23-0002
59-4002	59-4007	UG-1185A/U	01-0005
59-3003	59-3008	UG-1186A/U	02-0003
59-4003	59-4008	UG-1187A/U	02-0006
59-3004	59-3009	UG-1392/U	44-2001
59-4004	59-4009	UG-1393/U	44-2002
59-3005	59-3010	UG-1394/U	48-2001
59-4005	59-4010	UG-1395/U	46-2001
UG-18E/U	01-0101	UG-1396/U	46-2002
UG-19E/U	02-0104	UG-1397/U	45-2001
UG-20E/U	02-0101	UG-1398/U	45-2002
UG-21G/U	01-0005	UG-1399/U	49-2001
UG-22F/U	02-0006	UG-1460/U	73-0001
UG-23F/U	02-0003	UG-1461/U	75-0001
UG-58/U	04-0002	UG-1462/U	74-0001
UG-88/U	16-0101	UG-1463/U	76-0001
UG-89/U	17-0101	UG-1464/U	77-0002
UG-159D/U	03-0101	UG-1465/U	73-0002
UG-160E/U	03-0012	UG-1466/U	75-0002
UG-167F/U	01-0104	UG-1467/U	74-0002
UG-204D/U	01-0015	UG-1468/U	76-0002
UG-260/U	16-0102	UG-1487/U	01-0015
UG-261/U	17-0102	UG-1533/U	47-2001
UG-262/U	18-0101	UG-1537A/U	03-0012
UG-290/U	22-0001	UG-1619/U	77-0001
UG-291/U	18-0102	UG-1696/U	02-0015
UG-568/U	12-0001	UG-1697/U	02-0016
UG-569/U	14-0001	UG-1698/U	02-0017
UG-570/U	11-0002	UG-1700/U	03-0004
UG-571/U	08-0001	UG-1707/U	05-0002
UG-572/U	07-0001	UG-1708/U	05-0003
UG-573C/U	06-0002	UG-1746/U	06-0006
UG-594C/U	05-0101	UG-1748/U	06-0007
UG-625/U	12-0001	UG-1749/U	06-0008
UG-626C/U	06-0001	UG-1750/U	06-0009
UG-627/U	15-0001	UG-1751/U	06-0010
UG-629/U	08-0002	UG-1752/U	06-0011
UG-630/U	11-0001	UG-1753/U	06-0012
UG-631/U	09-0001	UG-1754/U	07-0003
UG-633/U	07-0002	UG-1755/U	07-0004
UG-680A/U	04-0001	UG-1756/U	07-0005
UG-704/U	09-0002	UG-1758/U	07-0007
UG-705/U	14-0002	UG-1759/U	07-0008
UG-706/U	13-0001	UG-1761/U	08-0003
UG-707C/U	06-0003	UG-1762/U	08-0004
UG-708C/U	06-0005	UG-1763/U	08-0005
UG-709/U	15-0002	UG-1765/U	08-0007
UG-710/U	10-0001	UG-1767/U	09-0003
UG-711C/U	06-0004	UG-1768/U	09-0004
UG-909/U	19-0101	UG-1769/U	10-0002
UG-910/U	19-0102	UG-1770/U	10-0003
UG-911/U	24-0001	UG-1771/U	10-0004
UG-912/U	24-0002	UG-1773/U	11-0004
UG-913/U	20-0101	UG-1774/U	11-0005
UG-935D/U	02-0032	UG-1775/U	11-0006
UG-940C/U	02-0031	UG-1776/U	11-0007
UG-941C/U	01-0125	UG-1777/U	11-0008
UG-1033/U	16-0103	UG-1779/U	15-0003
UG-1055/U	18-0103	UG-1780/U	15-0004
UG-1056/U	17-0103	UG-1785/U	16-0004

TABLE VI. Cross reference - Continued.

Superseded part M39012/	Superseding part M39012/	Superseded part M39012/	Superseding part M39012/
UG-1786/U	16-0005	UG-1802/U	18-0004
UG-1787/U	16-0006	UG-1803/U	18-0005
UG-1788/U	16-0007	UG-1804/U	19-0003
UG-1789/U	16-0008	UG-1805/U	19-0004
UG-1790/U	16-0010	UG-1806/U	19-0005
UG-1791/U	16-0009	UG-1807/U	19-0006
UG-1792/U	18-0010	UG-1808/U	19-0007
UG-1793/U	18-0009	UG-1809/U	19-0009
UG-1794/U	17-0004	UG-1810/U	19-0008
UG-1795/U	17-0005	UG-1811/U	18-0007
UG-1796/U	17-0006	UG-1812/U	20-0002
UG-1797/U	17-0007	UG-1813/U	20-0003
UG-1798/U	17-0008	UG-1814/U	18-0006
UG-1799/U	17-0010	UG-1817/U	10-0014
UG-1800/U	17-0009	UG-1819/U	03-0011
UG-1801/U	18-0008		

Hardware to connectors			
CW-123A/U	25-0006	MX-1286/U	25-0013
CW-155A/U	25-0015	MX-1142A/U	25-0001
CW-159/U	25-0016		-0002
	-0017	MX-1143A/U	25-0003
MX-195/U	25-0010		-0004
CW-282/U	25-0008	MX-1144/U	25-0005
	-0009		
MX-913/U	25-0011		
	-0012		

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are at the time set for opening of bids, qualified for inclusion in the applicable Qualified Products List whether or not such products have actually been so listed by that date. The attention of the contractor is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government, tested for qualification, in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Communications-Electronics Command, Department of the Army, Fort Monmouth, New Jersey 07703, however information pertaining to qualification of products may be obtained from Defense Electronics Supply Center (DESC-E), 1507 Wilmington Pike, Dayton, Ohio 45444.

6.4 Superseding information. This specification shall supersede the various RF connector basic specifications (i.e. MIL-C-71, MIL-C-3608, etc.) on a time interval basis, six months from the date of approval indicated on the applicable specification sheet of each connector series.

6.5 Cross-reference of part numbers. For the substitutability relationship of items covered by this specification and items covered by superseded documents, see table VI. However, all connectors in stock may be considered interchangeable with the new part number for a period of 1 year from the effective date of this specification.

6.6 Engineering information. Illustrations and additional engineering data on the connectors and fittings covered by this specification (see 3.1) are available in MIL-HBK-216, RF Transimission Lines and Fittings, copies of which are available upon request from the Naval Aviation Depot, Philadelphia, Pennsylvania.

6.6.1 Engineering parameters. The parameters of nominal impedance, voltage rating frequency range, and temperature range will be as specified.

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

Custodians:
Army - CR
Navy - EC
Air Force - 85

Review activities:
Army - AR, MI
Navy - OS
Air Force - 11, 17, 99
DLA - ES

User activities:
Army - AT
Navy - MC, CH, AS
Air Force - 19

Agent:
DLA - ES

Preparing activity:
Army - CR

(Project 5935-3232)

APPENDIX

ADDITIONAL INFORMATION ON TEST PROCEDURES

10. SCOPE

10.1 Scope. This appendix is to provide additional information to the user of this specification in performing the voltage standing wave ratio, RF leakage, and insertion loss tests.

20. APPLICABLE DOCUMENTS. This section is not applicable to this appendix.

30. TEST TYPES

30.1 Voltage standing wave ratio (see 4.6.11).

30.2 Test connector. The standard test-connector interface shall be in accordance with figures 8, 9, and 10. The standard test connector impedance shall be 50 *0.5 ohms.

40. MEASUREMENTS

40.1 RF leakage (see 4.6.23).

40.1.1 Measurement technique. The measurement of the leakage from connectors is performed by collecting the leakage energy in a coaxial system surrounding the leakage source. An outline of the instrumentation is shown on figure 6B. The device from which leakage is to be measured is incorporated on a uniform transmission line which is terminated in a matched load. The matched termination simplifies both the measurement procedure and data reduction. This complete coaxial system is embodied within a cylinder which forms, externally, a second coaxial system. The second coaxial system is terminated at one end in an adjustable short-circulating plunger and at the other in a tapered transition terminated in a matched detector.

For direct leakage measurements the adjustable short circuit serves several purposes.

The short-circuit position is adjusted to assure that an adequately low impedance appears behind the equivalent leakage generator. A matched termination can be substituted, but the resulting 6-db loss cannot be tolerated in some cases. In addition, if the leakage source is directional, as it indeed is for connectors with multiple leakage, it is possible for the leakage to be directed to this termination at some frequencies and not collected by the detector. For surface transfer-impedance measurements on connectors with leakage from more than one point in the connector, however, a matched termination is desirable in order to simplify the transformation of the measured data to absolute transfer impedance data. This is not needed to make relative comparisions in this test.

The equivalent leakage generator, in general, can have field components in the radial, axial, and circumferential* directions. Furthermore, these components are not necessarily circularly symmetric. Locally, TE, TM, and TEM modes can all exist, and in fact, for complete leakage measurements, the detector should couple to all but the measurement is more complex in this case. The excitation of the outer coaxial line, however, is beleived to be principally TEM, since the currents in the internal line are predominantly axial and symmetric. It is however, possible to have a symmetrical leakage currents which can generate the above mentioned modes. It is recommended that all measurements be made below the frequency that the higher order modes can propagate in the outer coaxial line.

The characteristic impedance of the outer coaxial line of the tri-axial system, which is formed with the inner conductor, should be matched to the detector. 50-ohm coaxial circuits are generally desired for convenience.

*The circumferential E field component is not usually present in axially symmetric components.

APPENDIX

The leakage power ratio is defined here as the ratio of the power detected to a 50-ohm detector at the output of the tri-axial unit to the power flowing through the internal 50-ohm connector or cable system. It is basically the attenuation through the tri-axial system. This definition appears arbitary in the sense that 50 ohms is an arbitrary load impedance. However, since the leakage source impedance is comparatively low, the voltage at the detector is essentially the open circuit leakage voltage. The ratio of the input voltage to the leaky device to this output voltage is an absolute leakage quantity, as is the measured power ratio, which is identically equal to the square of this voltage ratio.

The surface transfer impedance is obtained from this ratio as follows:

The surface transfer impedance is --

$$Z_{21} = \frac{e_2}{i_1}$$

Where

i_1 = Current flowing in internal line.

e_2 = Equivalent leakage voltage in external line.

In the connector leakage case, considering the equivalent leakage generator to be e_2 with an extremely low source impedance, this voltage e_2 appears at detector terminals, and the adjustable short circuit assures this. For a 50-ohm transmission-line system, the input power is --

$$50 i_1^2$$

The measured output power is --

$$\frac{e_2^2}{50} \qquad (1)$$

The measured power ratio A^2 is therefore,

$$A^2 = \frac{\frac{e_2^2}{50}}{50 i_1^2} = \frac{e_2^2}{(50)^2 i_1^2} \qquad (2)$$

Substituting and by definition,

$$Z_{21} = \frac{e_2}{i_1} = 50\ A \qquad (3)$$

The tri-axial system was set up principally to assess the relative leakage.

40.1.2 Measurement procedure. In measuring the leakage power ratio, A^2, basically a substitution technique is employed. A matched detector system is installed at the output connector of the tri-axial unit, and the unit is driven as shown on figure 6B. In this set-up, the short circuit is adjusted to produce a maximum indication at the detector. The detector is then connected directly to the source and the change of attenuation required to yield the initial detector level, is measured.

The sensitivity of this system is obviously limited by the sensitivity of the detector and the power available. A sensitive parallel IF substitution sytem is employed, and for the low leakage configuration about 100 milliwatts of power is required.

The principal sources of error are attenuator errors and mismatch at the receiver (mixer) input. For connector measurements, the error due to mismatch is directly proportional to VSWR since the equivalent leakage source impedance is small. The indicated leakage power can vary between the extremes, PxVSWR to P + VSWR, where P is the power that would be delivered to a matched system. A VSWR of 2 will produce ±3-dB error therefore.

In advance of installing the inner coaxial system into the outer of the tri-axial system, the inner system may be excited, and the immediate vicinity of the leakage point or associated connector and attachment points probed with a small loop or dipole to establish how critical the mating, the connector and joints are.

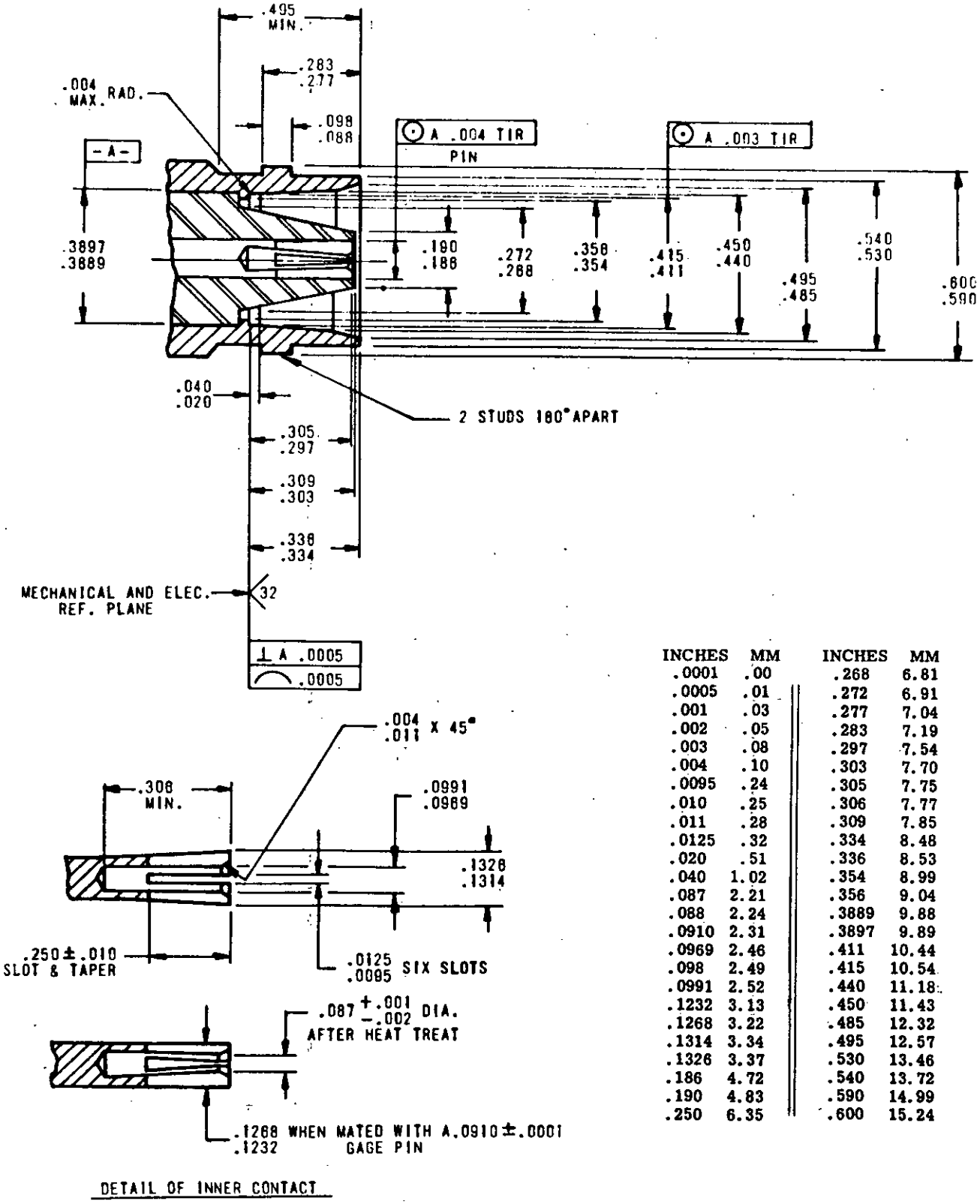
40.2 RF insertion loss (see 4.6.23).

40.2.1 The following procedure may be used when performing the insertion loss test of 4.6.23:

Assemble one 8" ±1" long cable assembly terminated in a male and female test connector. Record its relative electrical length. Tune out its input VSWR using tuner number 4. Do not disturb tuner. For N, C, SC use M17/75-RG214 and "N" test connectors. For BNC, TNC, and TPS, use solid copper shield cable equivalent of M17/111-RG303 (Coaxitube number 1163.T1403-20 of Precision Tube Co.) and TNC connectors. Measure insertion loss L_1 of tuner number 4 and test cable.

Insert the connector pair to be tested in the middle, remove enough so that the electrical length is the same as above within 0.05 cm, record $\Delta\ell_1 + \Delta\ell_2$ the total length of dielectric removed; keep tuner number 4 in the same position as above. Measure insertion loss L_2 of tuner number 4 and test cable including connector pair.

Measure attenuation of 50 feet of test cable and compute loss α per inch $L_c = L_2 - L_1 + \alpha (\Delta\ell_1 = \Delta\ell_2)$.

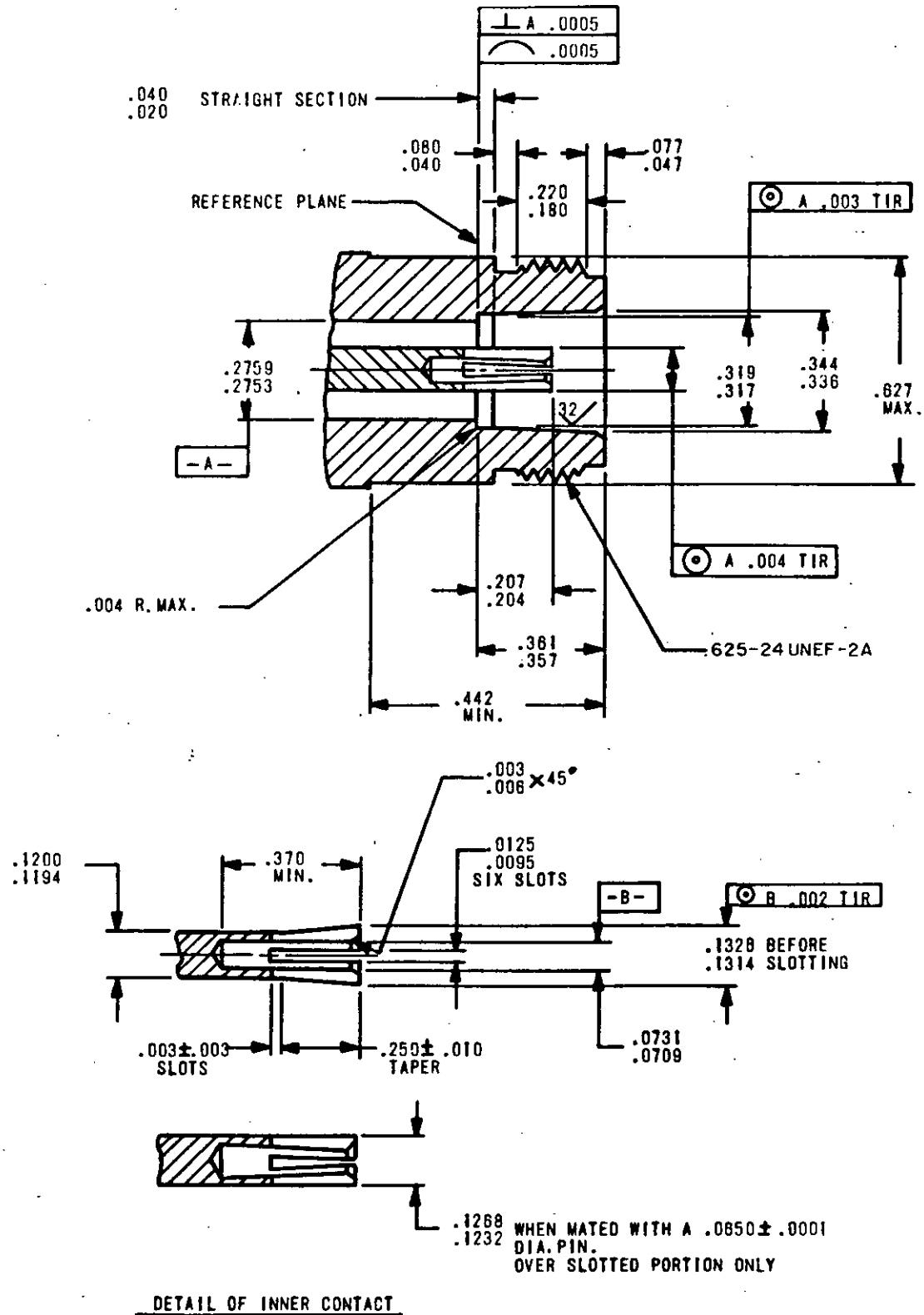


DETAIL OF INNER CONTACT

INCHES	MM	INCHES	MM
.0001	.00	.268	6.81
.0005	.01	.272	6.91
.001	.03	.277	7.04
.002	.05	.283	7.19
.003	.08	.297	7.54
.004	.10	.303	7.70
.0095	.24	.305	7.75
.010	.25	.306	7.77
.011	.28	.309	7.85
.0125	.32	.334	8.48
.020	.51	.336	8.53
.040	1.02	.354	8.99
.087	2.21	.356	9.04
.088	2.24	.3889	9.88
.0910	2.31	.3897	9.89
.0969	2.46	.411	10.44
.098	2.49	.415	10.54
.0991	2.52	.440	11.18
.1232	3.13	.450	11.43
.1268	3.22	.485	12.32
.1314	3.34	.495	12.57
.1326	3.37	.530	13.46
.186	4.72	.540	13.72
.190	4.83	.590	14.99
.250	6.35	.600	15.24

Series C 50 OHMS

FIGURE 8. Standard test connector interface - female.

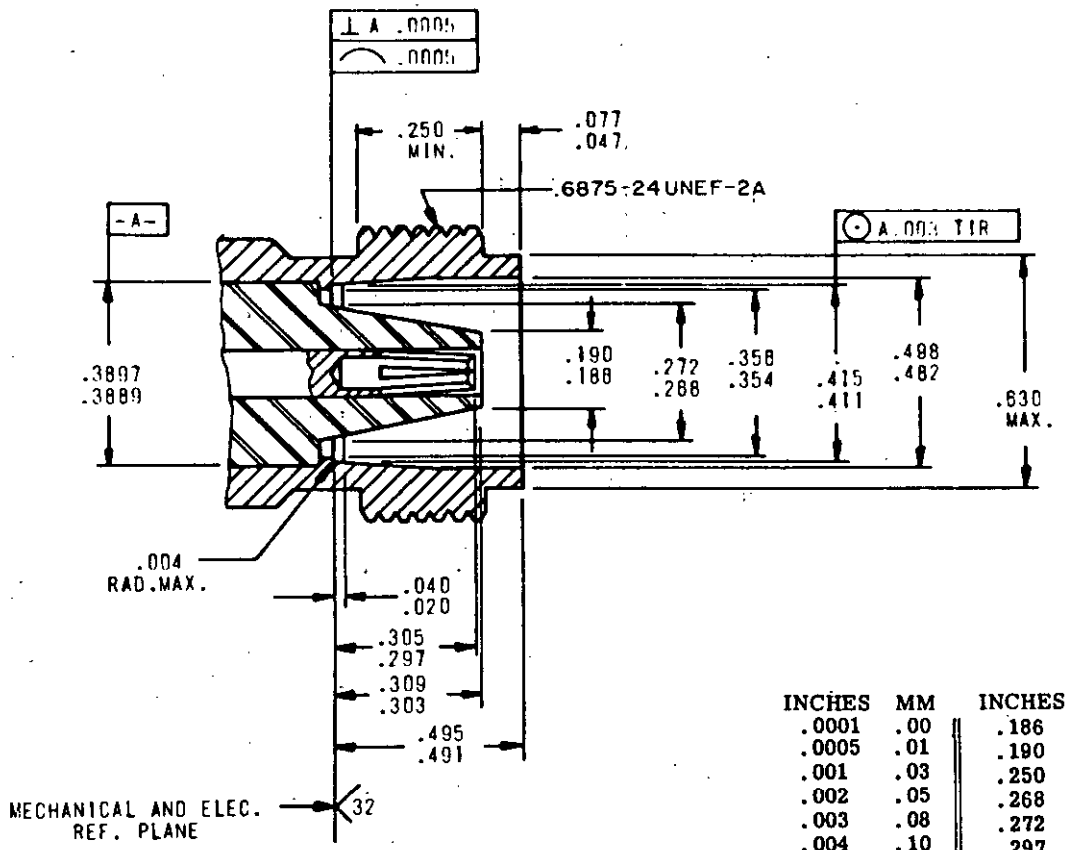


DETAIL OF INNER CONTACT

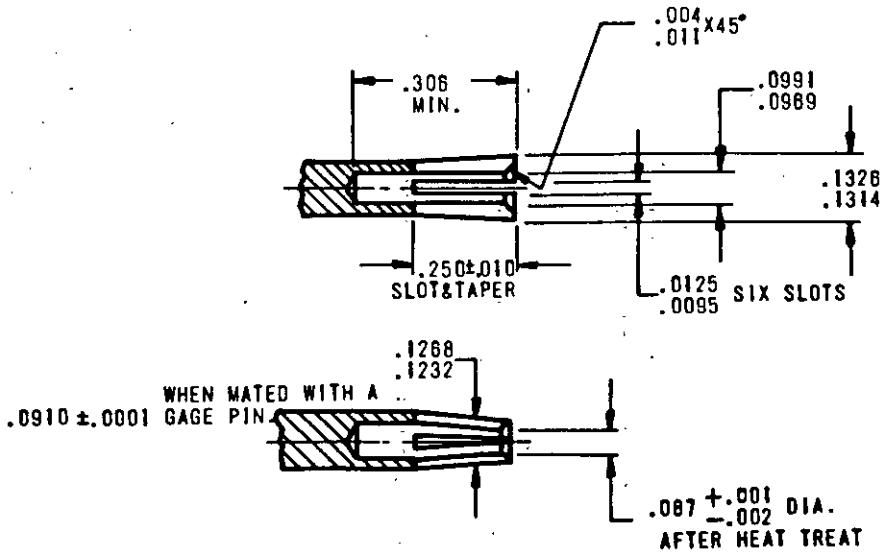
INCHES	MM
.0001	.00
.0005	.01
.002	.05
.003	.08
.004	.10
.006	.15
.0095	.24
.010	.25
.0125	.32
.020	.51
.040	1.02
.047	1.19
.0650	1.65
.0709	1.80
.0731	1.86
.077	1.96
.080	2.03
.1194	3.03
.1200	3.05
.1232	3.13
.1268	3.22
.1314	3.34
.1326	3.37
.180	4.57
.204	5.18
.207	5.26
.220	5.59
.250	6.35
.2753	6.99
.2759	7.01
.317	8.05
.319	8.10
.336	8.53
.344	8.74
.357	9.07
.361	9.17
.370	9.40
.442	11.23
.627	15.93

Series N 50 OHMS

FIGURE 8. Standard test connector interface - female - Continued.



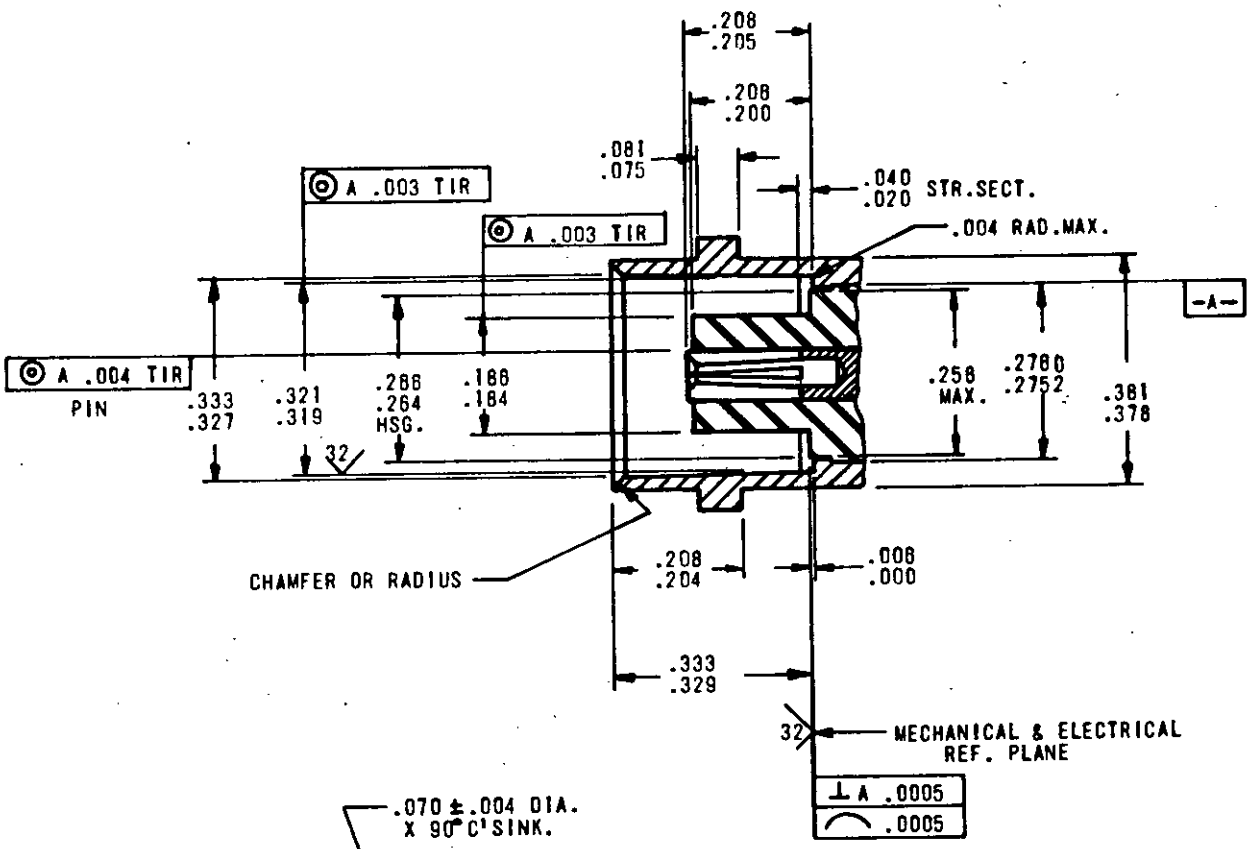
INCHES	MM	INCHES	MM
.0001	.00	.186	4.72
.0005	.01	.190	4.83
.001	.03	.250	6.35
.002	.05	.268	6.81
.003	.08	.272	6.91
.004	.10	.297	7.54
.0095	.24	.303	7.70
.010	.25	.305	7.75
.011	.28	.306	7.77
.0125	.32	.309	7.85
.020	.51	.354	8.99
.040	1.02	.356	9.04
.047	1.19	.3889	9.88
.077	1.96	.3897	9.90
.087	2.21	.411	10.44
.0910	2.31	.415	10.54
.0969	2.46	.482	12.24
.0991	2.52	.491	12.47
.1232	3.13	.495	12.57
.1268	3.22	.498	12.65
.1314	3.34	.630	16.00
.1326	3.37		

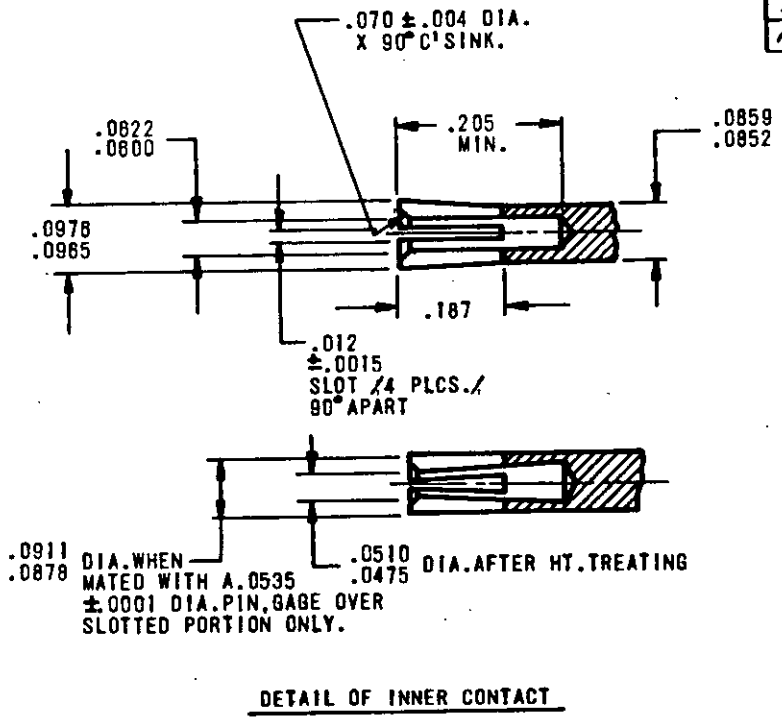


DETAIL OF INNER CONTACT

Series SC 50 ohms

FIGURE 8. Standard test connector interface - female - Continued.



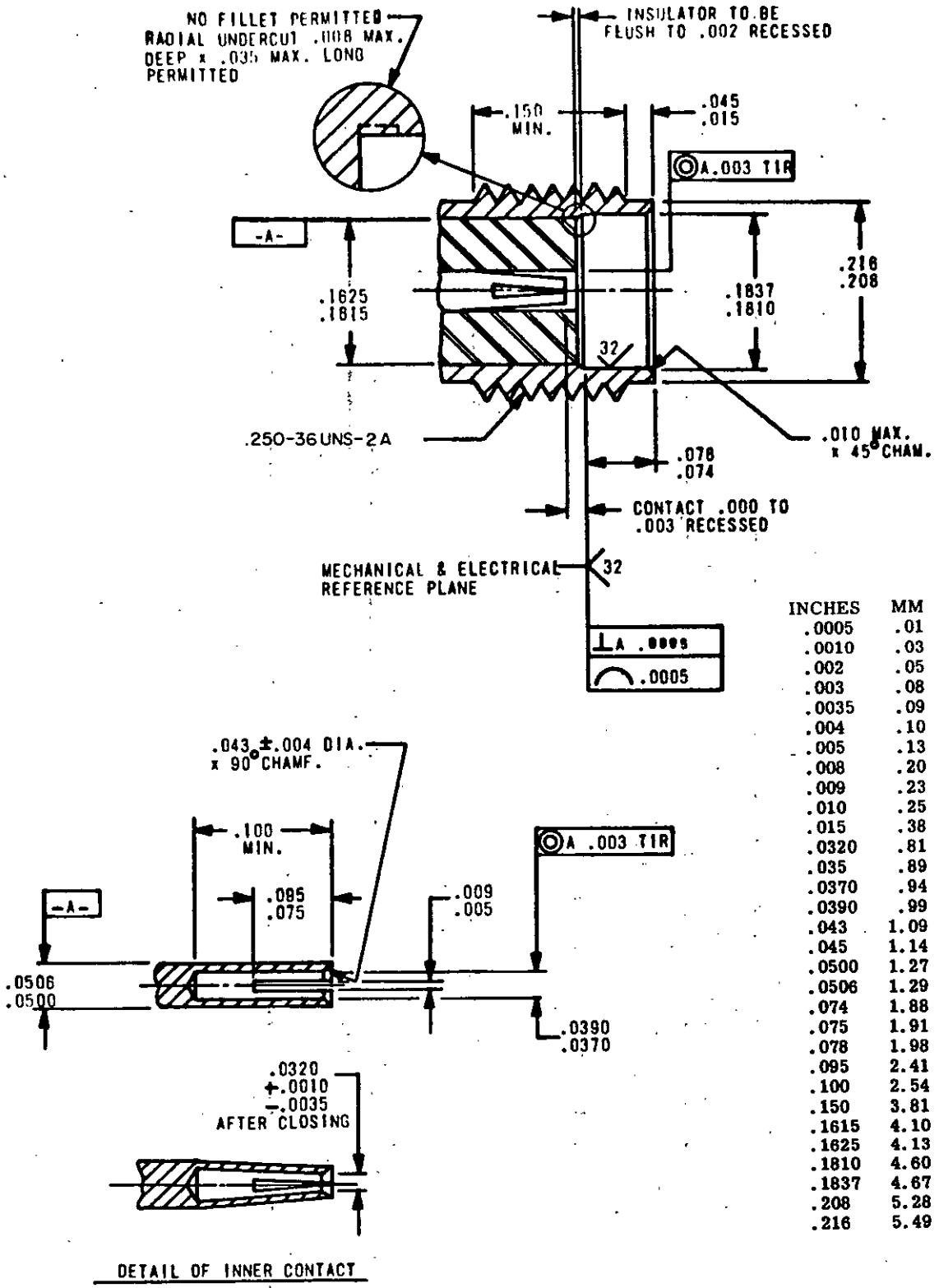


DETAIL OF INNER CONTACT

INCHES	MM	INCHES	MM
.0001	.00	.0965	2.45
.0005	.01	.0976	2.48
.0015	.04	.184	4.67
.003	.08	.186	4.72
.004	.10	.187	4.75
.006	.15	.200	5.08
.012	.30	.204	5.18
.020	.51	.205	5.21
.031	.79	.206	5.23
.033	.84	.208	5.28
.040	1.02	.256	6.50
.0475	1.21	.264	6.71
.0510	1.30	.266	6.76
.0535	1.36	.2752	6.99
.0600	1.52	.2760	7.01
.0622	1.58	.319	8.10
.070	1.78	.321	8.15
.075	1.91	.327	8.31
.081	2.00	.329	8.36
.0852	2.16	.333	8.46
.0859	2.18	.378	9.60
.0878	2.23	.381	9.68
.0911	2.31		

Series BNC 50 OHMS

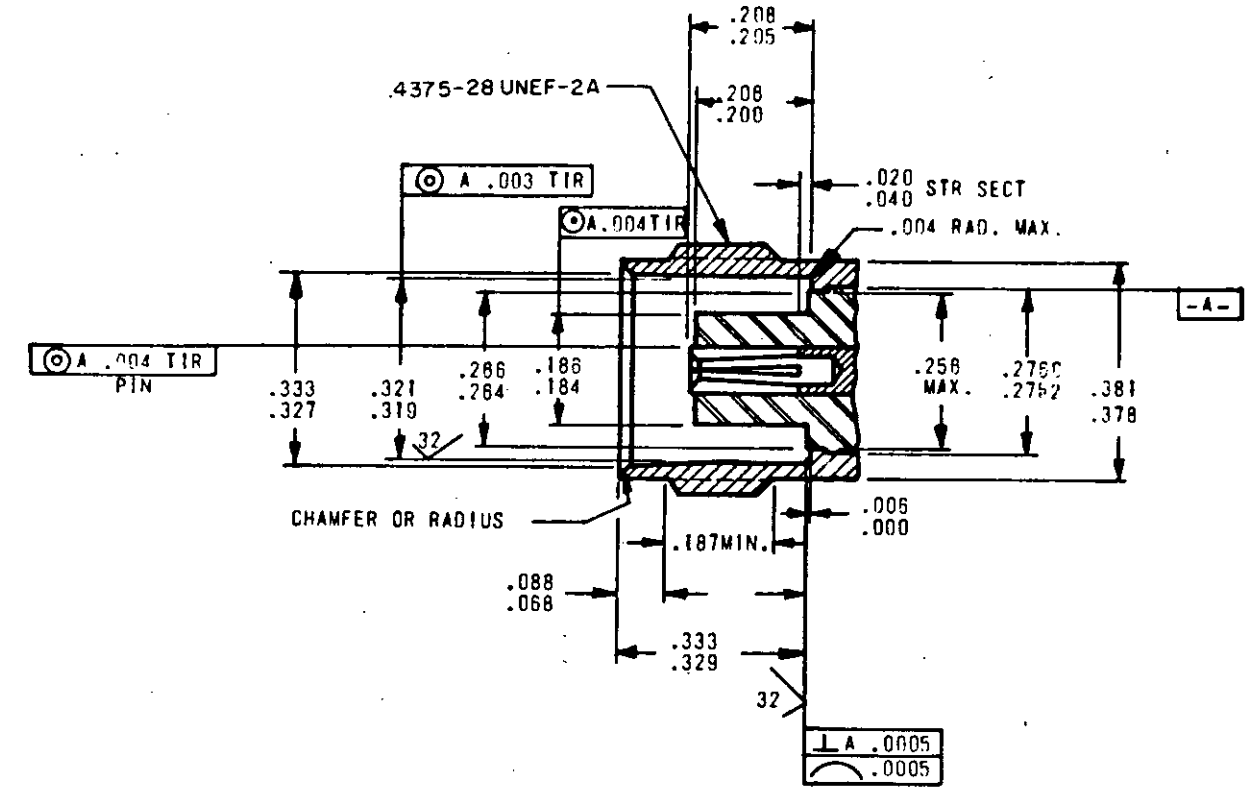
FIGURE 8. Standard test connector interface - female - Continued.

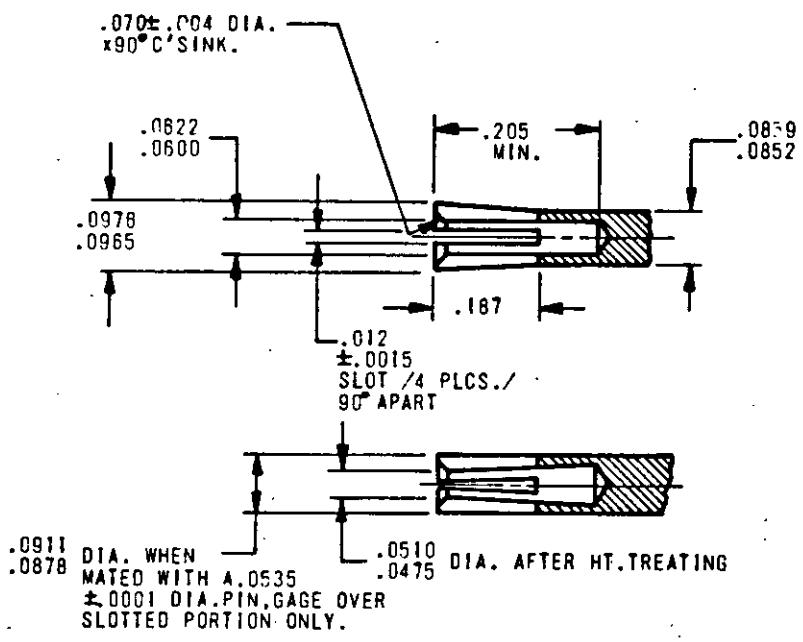


INCHES	MM
.0005	.01
.0010	.03
.002	.05
.003	.08
.0035	.09
.004	.10
.005	.13
.008	.20
.009	.23
.010	.25
.015	.38
.0320	.81
.035	.89
.0370	.94
.0390	.99
.043	1.09
.045	1.14
.0500	1.27
.0506	1.29
.074	1.88
.075	1.91
.078	1.98
.095	2.41
.100	2.54
.150	3.81
.1615	4.10
.1625	4.13
.1810	4.60
.1837	4.67
.208	5.28
.216	5.49

Series SMA 50 OHMS

FIGURE 8. Standard test connector interface - female - Continued.



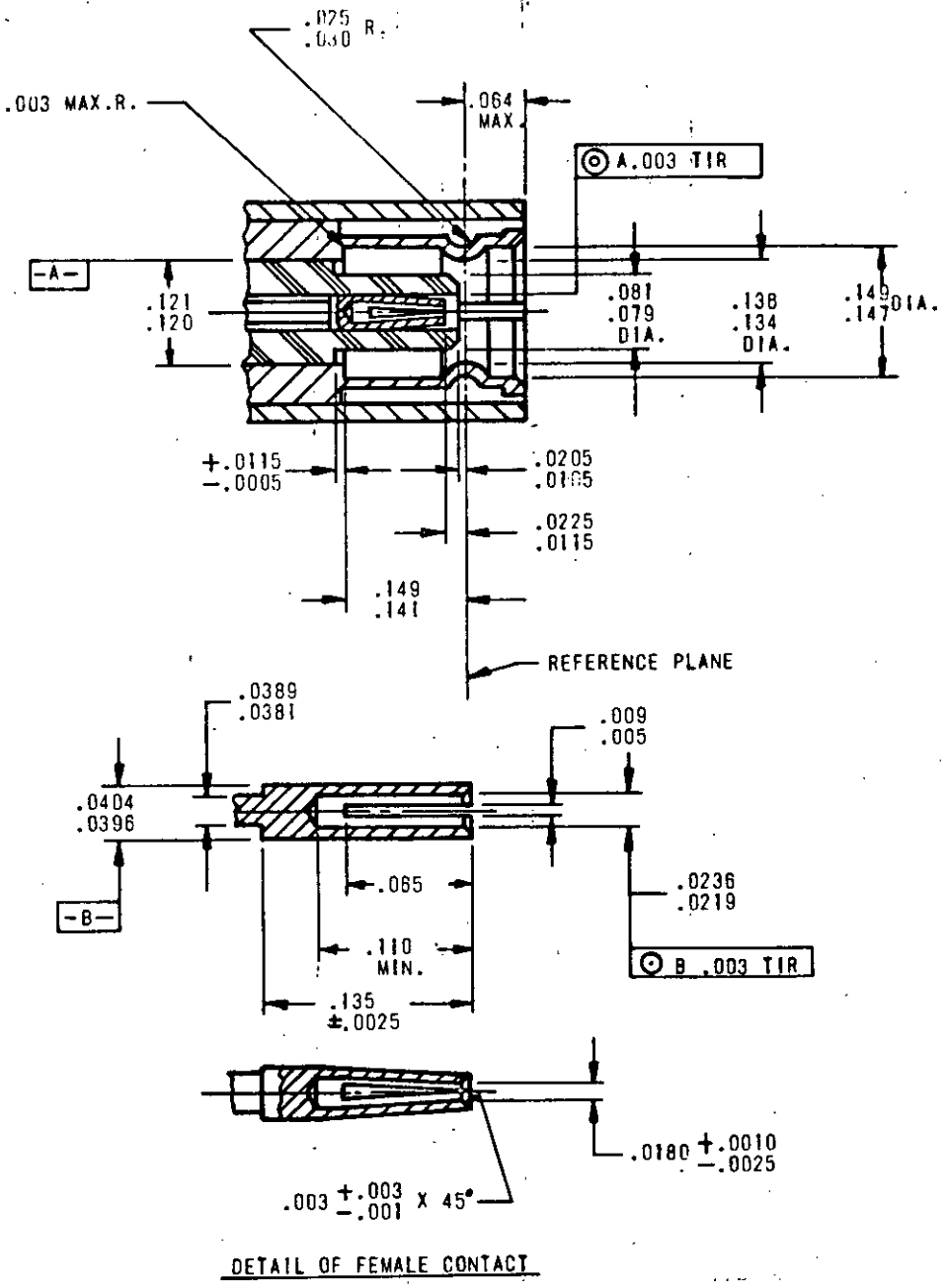


DETAIL OF INNER CONTACT

INCHES	MM	INCHES	MM
.0001	.00	.0911	2.31
.0005	.01	.0965	2.45
.0015	.04	.0976	2.48
.003	.08	.184	4.67
.004	.10	.186	4.72
.006	.15	.187	4.75
.012	.30	.200	5.08
.020	.51	.205	5.21
.031	.79	.206	5.23
.033	.84	.208	5.28
.040	1.02	.256	6.50
.0475	1.21	.264	6.71
.0510	1.30	.266	6.76
.0535	1.36	.2752	6.99
.0600	1.52	.2760	7.01
.0622	1.58	.319	8.10
.068	1.73	.321	8.15
.070	1.78	.327	8.31
.0852	2.16	.329	8.36
.0859	2.18	.333	8.46
.0878	2.23	.378	9.60
.088	2.24	.381	9.68

Series TNC 50 OHMS

FIGURE 8. Standard test connector interface - female - Continued.

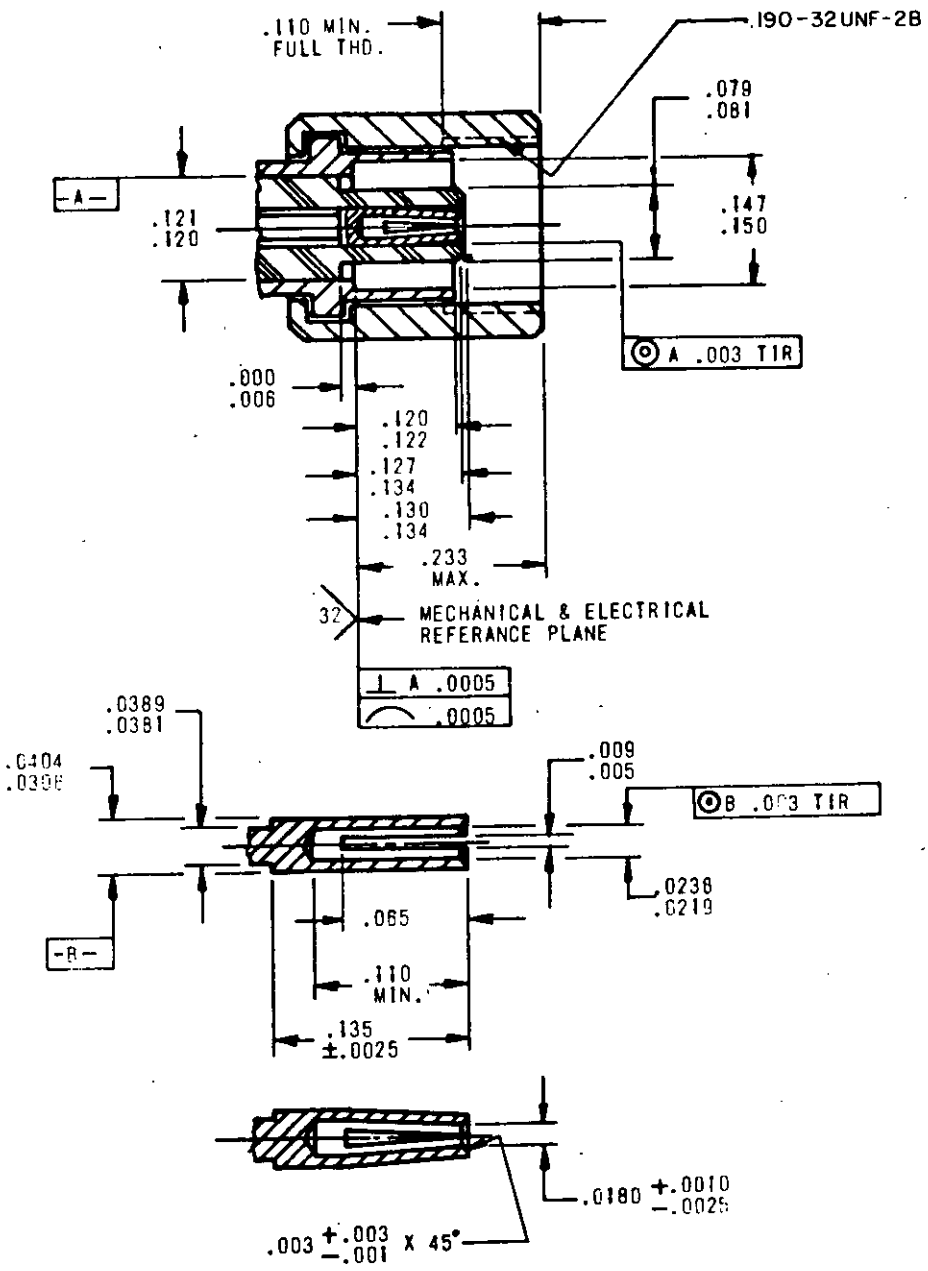


DETAIL OF FEMALE CONTACT

INCHES	MM
.0005	.01
.0010	.03
.0025	.06
.003	.08
.005	.13
.009	.23
.0105	.27
.0115	.29
.0180	.46
.0205	.52
.0219	.56
.0225	.57
.0236	.60
.025	.64
.030	.76
.0381	.97
.0389	.99
.0396	1.01
.0404	1.03
.064	1.63
.065	1.65
.079	2.01
.081	2.06
.110	2.79
.120	3.05
.121	3.07
.134	3.40
.135	3.43
.136	3.45
.141	3.58
.147	3.73
.149	3.78

Series SMB 50 OHMS

FIGURE 8. Standard test connector interface - female - Continued.



DETAIL FEMALE CONTACT

INCHES	MM
.0005	.01
.0010	.03
.0025	.06
.003	.07
.005	.13
.006	.15
.009	.23
.0180	.46
.0219	.56
.0236	.60
.0381	.97
.0389	.99
.0396	1.01
.0404	1.03
.065	1.65
.079	2.01
.081	2.06
.110	2.79
.120	3.05
.121	3.07
.122	3.10
.127	3.23
.130	3.30
.134	3.40
.135	3.43
.147	3.73
.150	3.81
.233	5.92

Series SMC 50 OHMS

FIGURE 8. Standard test connector interface - female - Continued.

NOTES:

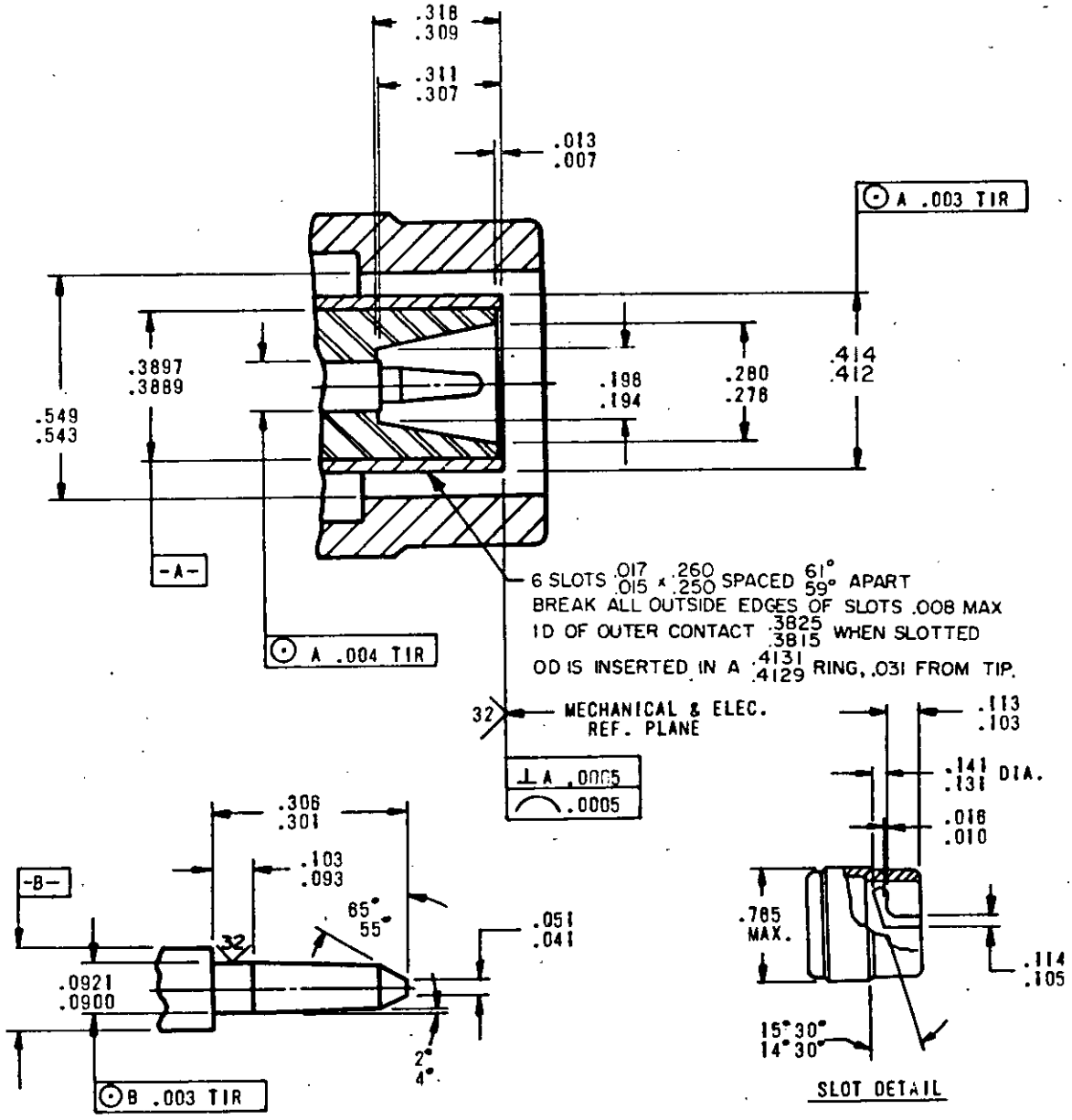
1. The construction, material, and finish of the standard female connector shall result in satisfactory electrical and mechanical performance and provide the following minimum life cycles when mated with the same series male standard test connector.

Series	Life cycles
C, N, SC; TNC	10,000
BNC	5,000
SMA 1/, SMB, SMC	2,000

1/Shall hold weight of two ounces minimum on .032(.81 mm) diameter pin with ten microninch finish.

2. Dimensions shown are for the standard test connector only.
3. Dimensions are in inches.
4. Metric equivalents are given for general information only and are based upon 1 inch = 25.4 mm.

FIGURE 8. Standard test connector interface - female - Continued.

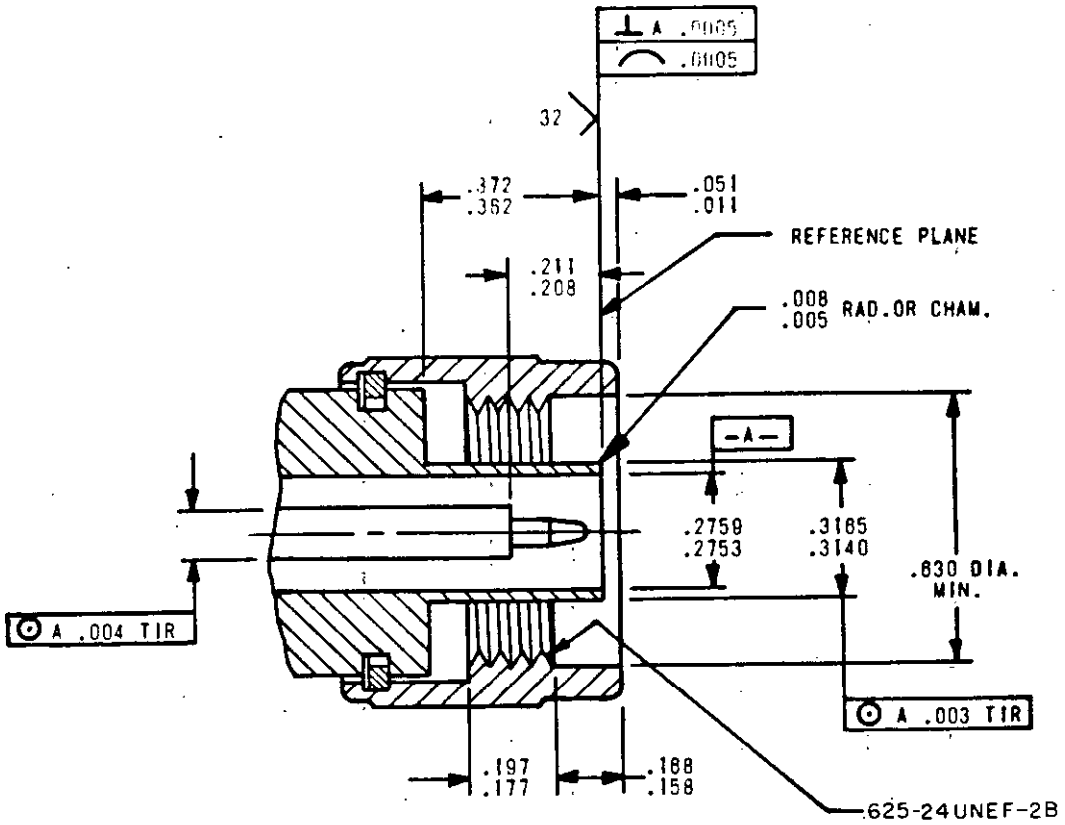


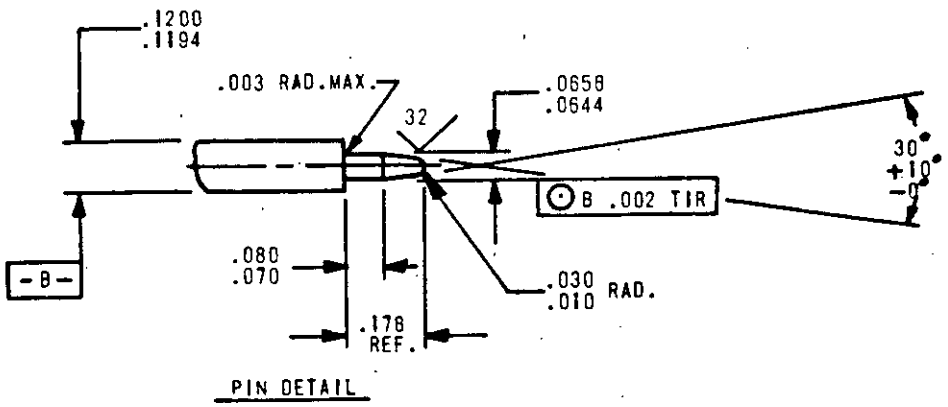
PIN DETAIL

INCHES	MM	INCHES	MM	INCHES	MM	INCHES	MM
.0005	.01	.051	1.30	.198	5.03	.3815	9.69
.003	.08	.0900	2.29	.250	6.35	.3825	9.72
.004	.10	.0921	2.34	.260	6.60	.3889	9.88
.007	.18	.093	2.36	.276	7.01	.3897	9.90
.008	.20	.103	2.62	.280	7.11	.412	10.46
.010	.25	.105	2.67	.301	7.65	.4129	10.49
.013	.33	.113	2.87	.306	7.77	.4131	10.49
.015	.38	.114	2.90	.307	7.80	.414	10.52
.016	.41	.131	3.33	.309	7.85	.543	13.79
.017	.43	.141	3.58	.311	7.90	.549	13.94
.041	1.04	.194	4.93	.318	8.08	.765	19.43

Series C 50 OHMS

FIGURE 9. Standard test connector interface - male.

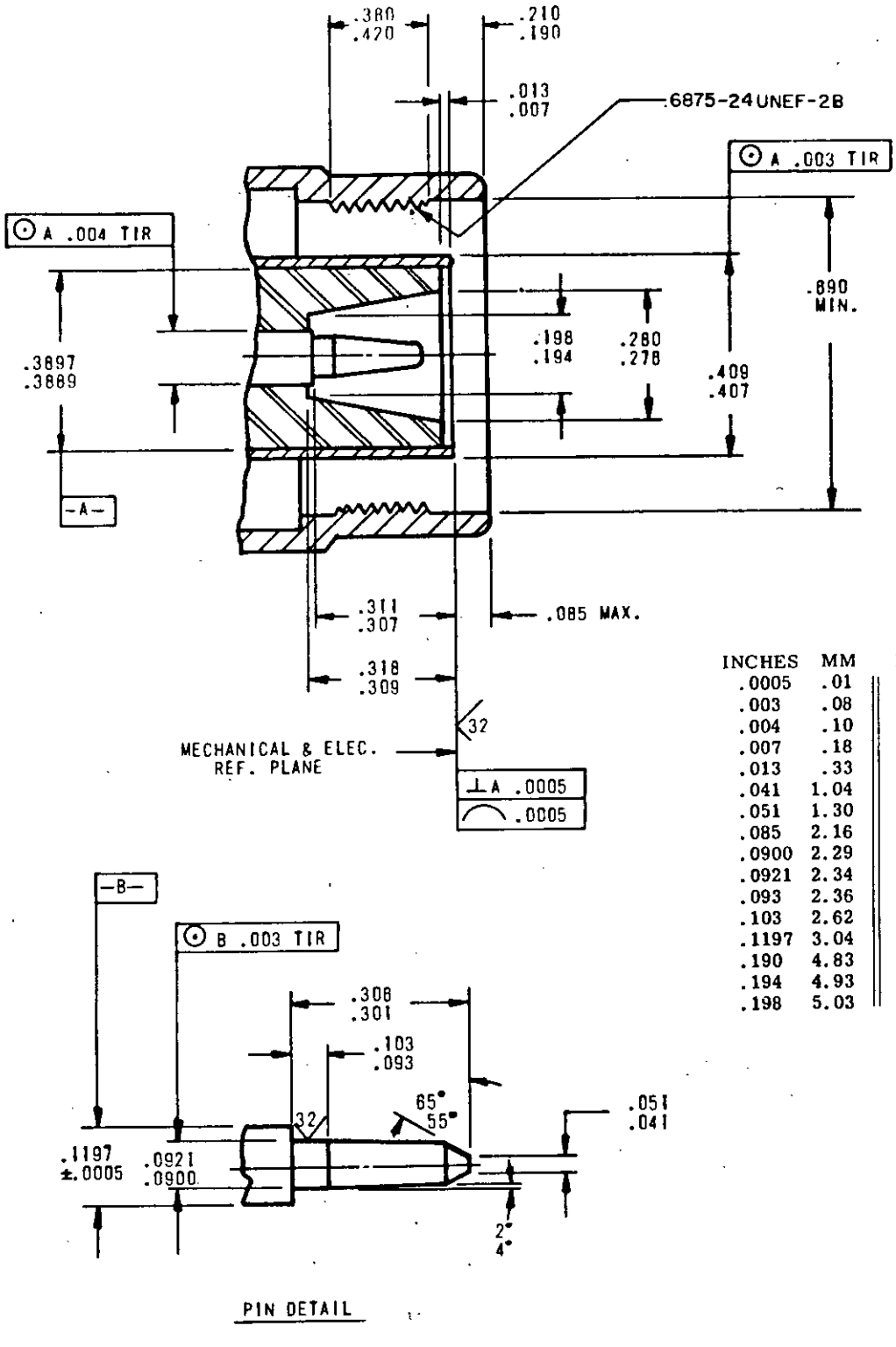




INCHES	MM	INCHES	MM
.0005	.01	.1200	3.05
.002	.05	.158	4.01
.003	.08	.168	4.27
.004	.10	.177	4.50
.005	.13	.178	4.52
.008	.20	.197	5.00
.010	.25	.208	5.28
.011	.28	.211	5.36
.030	.76	.2753	6.99
.051	1.30	.2759	7.01
.0644	1.64	.3140	7.98
.0656	1.67	.3165	8.04
.070	1.78	.362	9.19
.080	2.03	.372	9.45
.1194	3.03	.630	16.00

Series N 50 OHMS

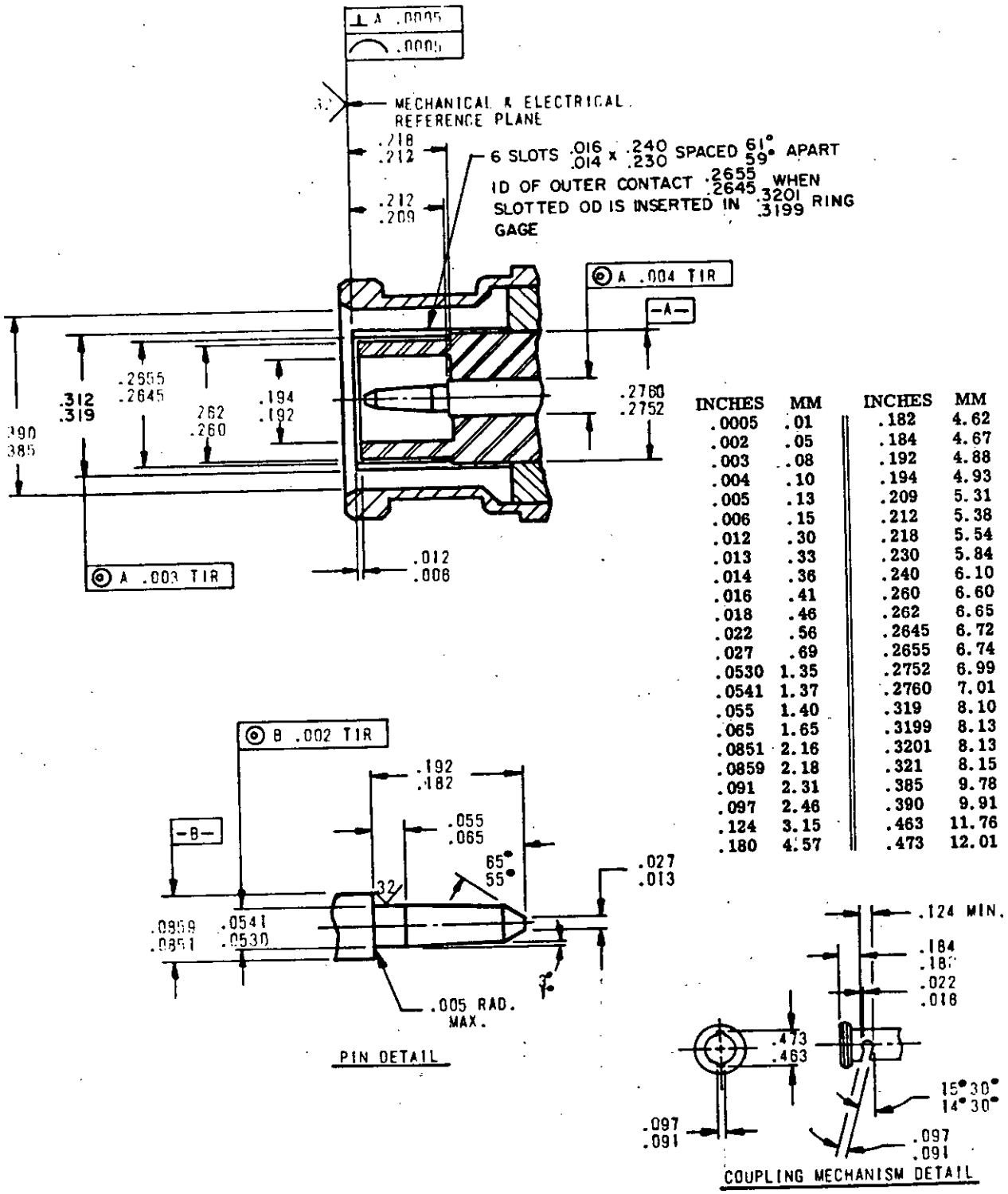
FIGURE 9. Standard test connector interface - male - Continued.



INCHES	MM	INCHES	MM
.0005	.01	.210	5.33
.003	.08	.276	7.01
.004	.10	.280	7.11
.007	.18	.301	7.64
.013	.33	.306	7.77
.041	1.04	.307	7.80
.051	1.30	.309	7.85
.085	2.16	.311	7.90
.0900	2.29	.318	8.08
.0921	2.34	.380	9.65
.093	2.36	.3889	9.88
.103	2.62	.3897	9.90
.1197	3.04	.407	10.34
.190	4.83	.409	10.39
.194	4.93	.420	10.67
.198	5.03	.690	17.53

Series SC 50 OHMS

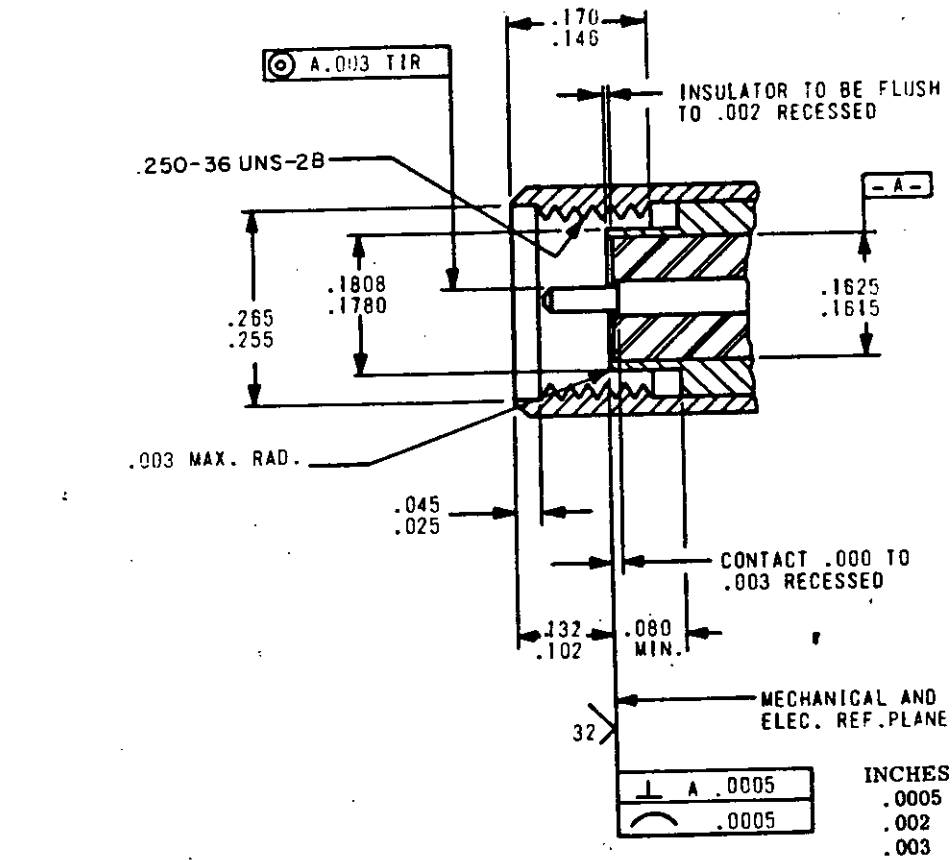
FIGURE 9. Standard test connector interface - male - Continued.



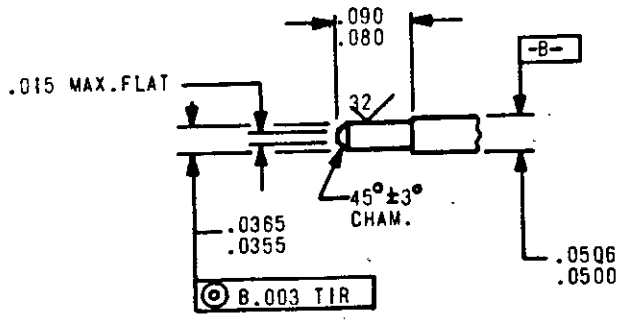
INCHES	MM	INCHES	MM
.0005	.01	.182	4.62
.002	.05	.184	4.67
.003	.08	.192	4.88
.004	.10	.194	4.93
.005	.13	.209	5.31
.006	.15	.212	5.38
.012	.30	.218	5.54
.013	.33	.230	5.84
.014	.36	.240	6.10
.016	.41	.260	6.60
.018	.46	.262	6.65
.022	.56	.2645	6.72
.027	.69	.2655	6.74
.0530	1.35	.2752	6.99
.0541	1.37	.2760	7.01
.055	1.40	.319	8.10
.065	1.65	.3199	8.13
.0851	2.16	.3201	8.13
.0859	2.18	.321	8.15
.091	2.31	.385	9.78
.097	2.46	.390	9.91
.124	3.15	.463	11.76
.180	4.57	.473	12.01

Series BNC 50 OHMS

FIGURE 9. Standard test connector interface - male - Continued.



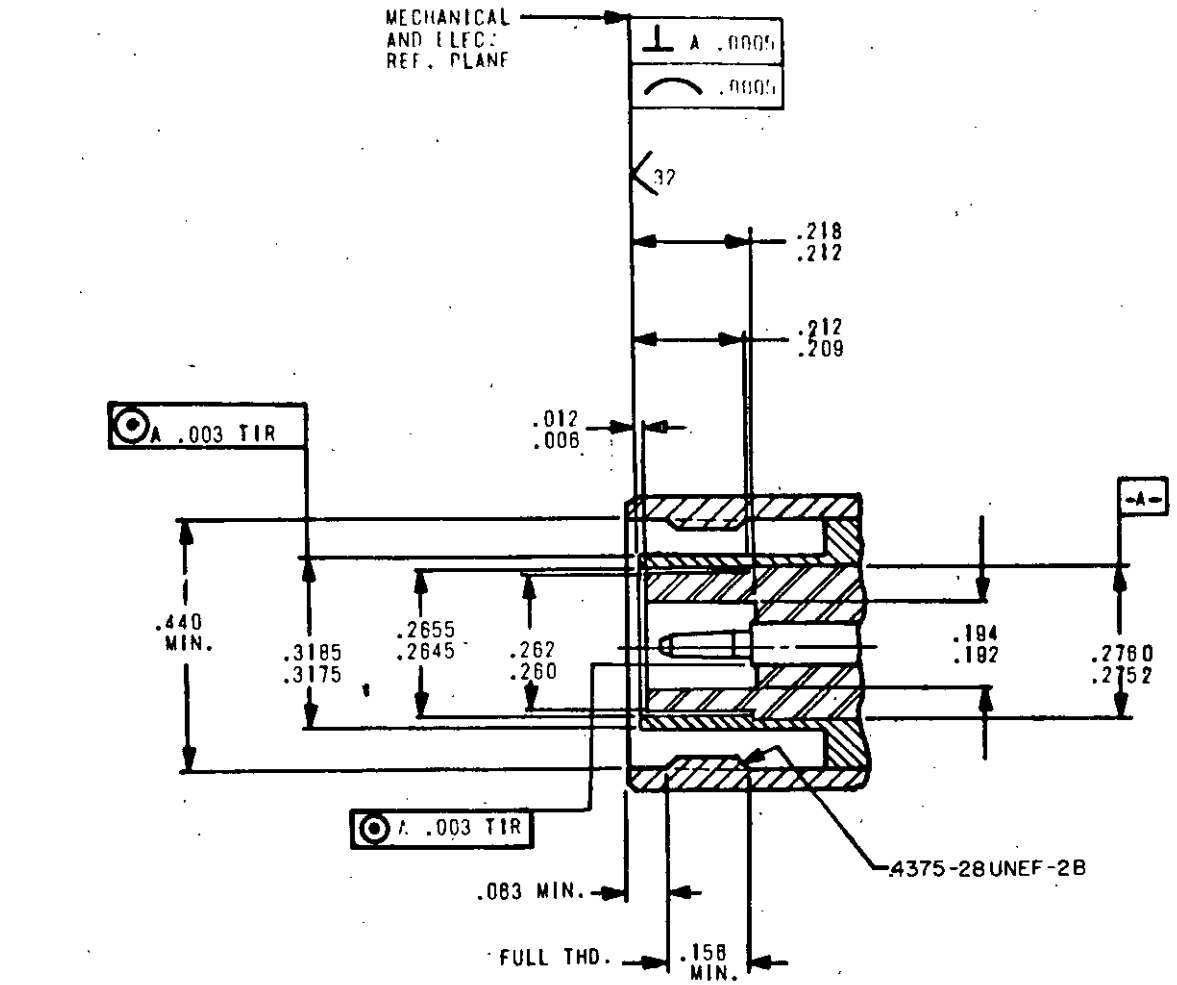
INCHES	MM
.0005	.01
.002	.05
.003	.08
.015	.38
.025	.64
.0355	.90
.0365	.93
.045	1.14
.0500	1.27
.0506	1.29
.080	2.03
.090	2.29
.102	2.59
.132	3.35
.146	3.71
.1615	4.10
.1625	4.13
.170	4.32
.1708	4.34
.1808	4.59
.255	6.48
.265	6.73

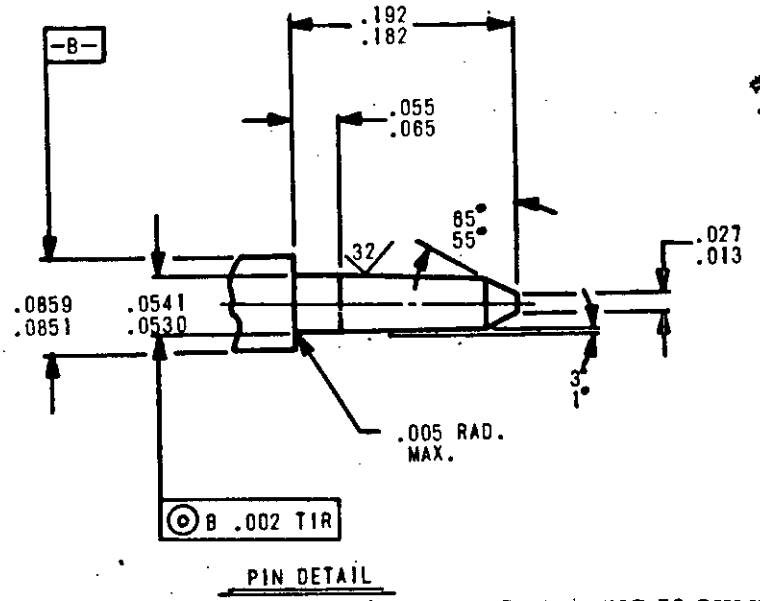


DETAIL OF INNER CONTACT

Series SMA 50 OHMS

FIGURE 9. Standard test connector interface - male - Continued.



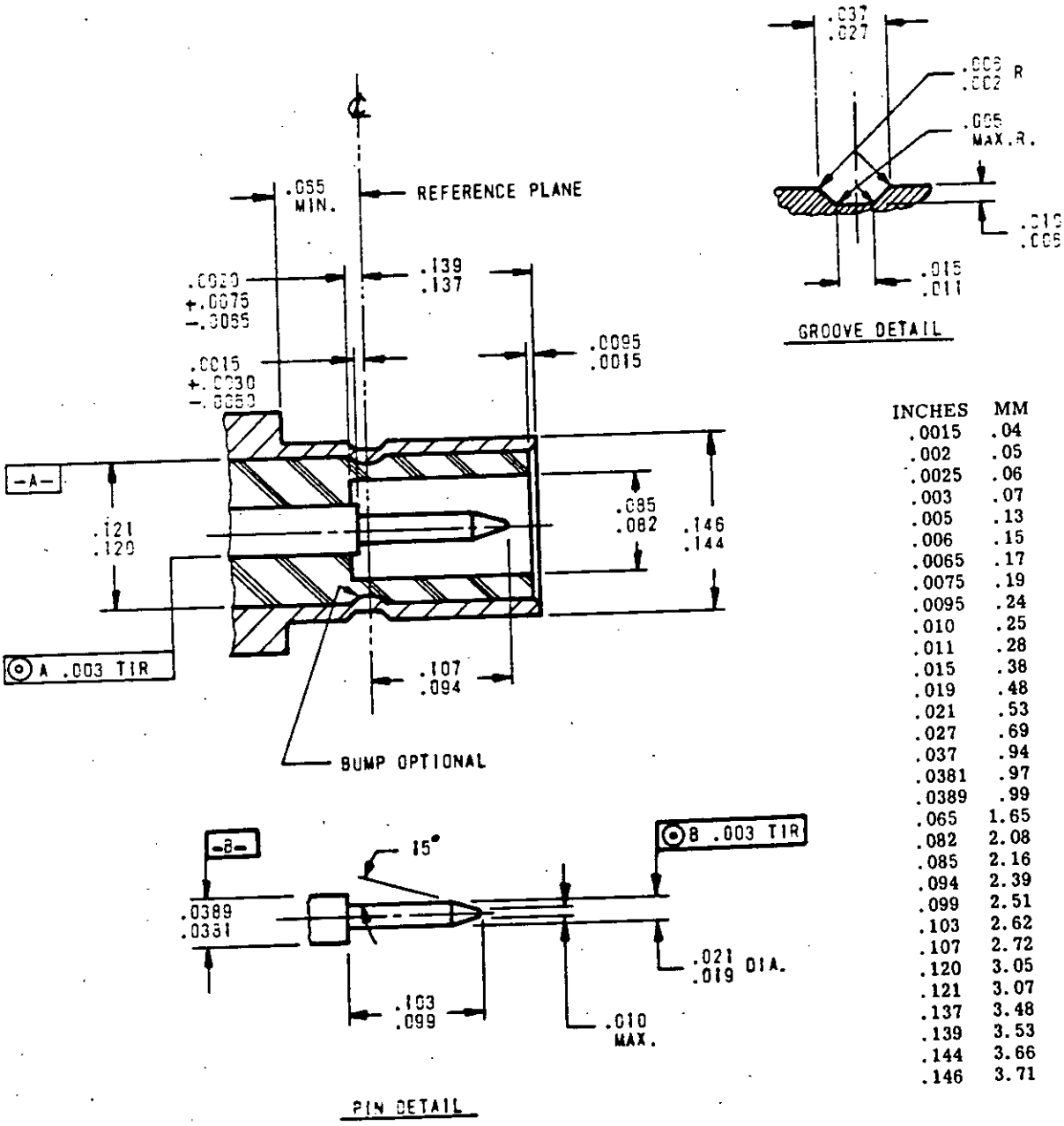


PIN DETAIL

INCHES	MM	INCHES	MM
.0005	.01	.182	4.62
.002	.05	.192	4.88
.003	.08	.194	4.93
.005	.13	.209	5.31
.006	.15	.212	5.38
.012	.30	.218	5.54
.013	.33	.260	6.60
.027	.69	.262	6.65
.0530	1.35	.2645	6.72
.0541	1.37	.2655	6.74
.055	1.40	.2752	6.99
.063	1.60	.2760	7.01
.065	1.65	.3175	8.06
.0851	2.16	.3185	8.09
.0859	2.18	.440	11.18
.156	3.96		

Series TNC 50 OHMS

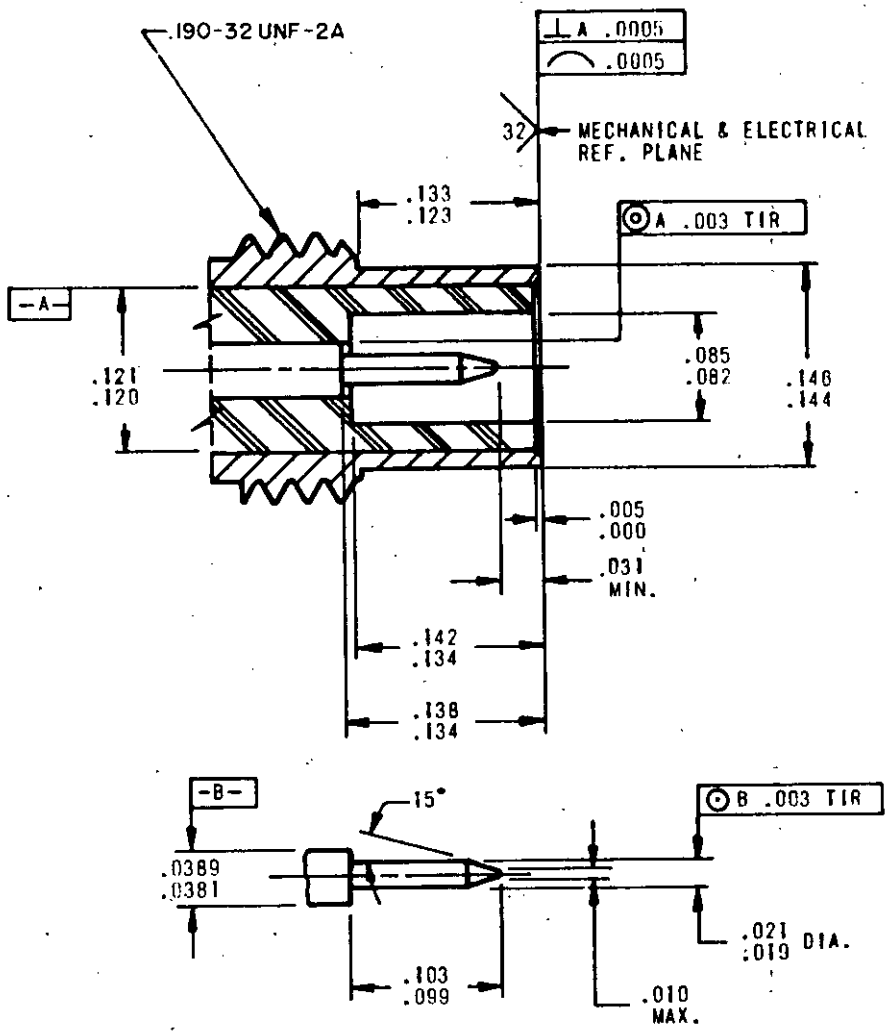
FIGURE 9. Standard test connector interface - male - Continued.



INCHES	MM
.0015	.04
.002	.05
.0025	.06
.003	.07
.005	.13
.006	.15
.0065	.17
.0075	.19
.0095	.24
.010	.25
.011	.28
.015	.38
.019	.48
.021	.53
.027	.69
.037	.94
.0381	.97
.0389	.99
.065	1.65
.082	2.08
.085	2.16
.094	2.39
.099	2.51
.103	2.62
.107	2.72
.120	3.05
.121	3.07
.137	3.48
.139	3.53
.144	3.66
.146	3.71

Series SMB 50 OHMS

FIGURE 9. Standard test connector interface - male - Continued.



INCHES	MM
.0005	.01
.003	.08
.005	.13
.010	.25
.019	.48
.021	.53
.031	.79
.0381	.97
.0389	.99
.082	2.08
.085	2.16
.099	2.51
.103	2.62
.120	3.05
.121	3.07
.123	3.12
.133	3.38
.134	3.40
.138	3.51
.142	3.61
.144	3.66
.146	3.71

PIN DETAIL

Series SMC 50 OHMS

FIGURE 9. Standard test connector interface - male - Continued.

APPENDIX

NOTES:

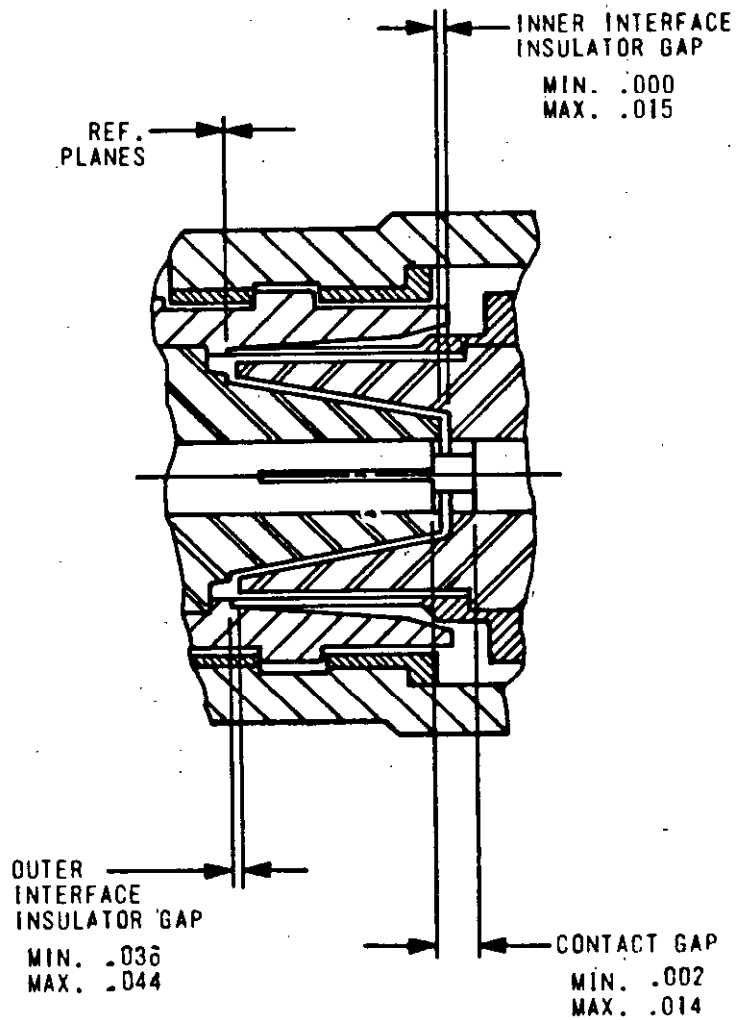
1. The construction, material, and finish of the standard female connector shall result in satisfactory electrical and mechanical performance and provide the following minimum life cycles when mated with the same series male standard test connector.

Series	Life cycles
C, N, SC, TNC	10,000
BNC	5,000
SMA, SMB, SMC	2,000

2. Dimensions shown are for the standard test connector only.
3. Dimensions are in inches.
4. Metric equivalents are given for general information only and are based upon 1 inch = 25.4 mm.

FIGURE 9. Standard test connector interface - male - Continued.

APPENDIX

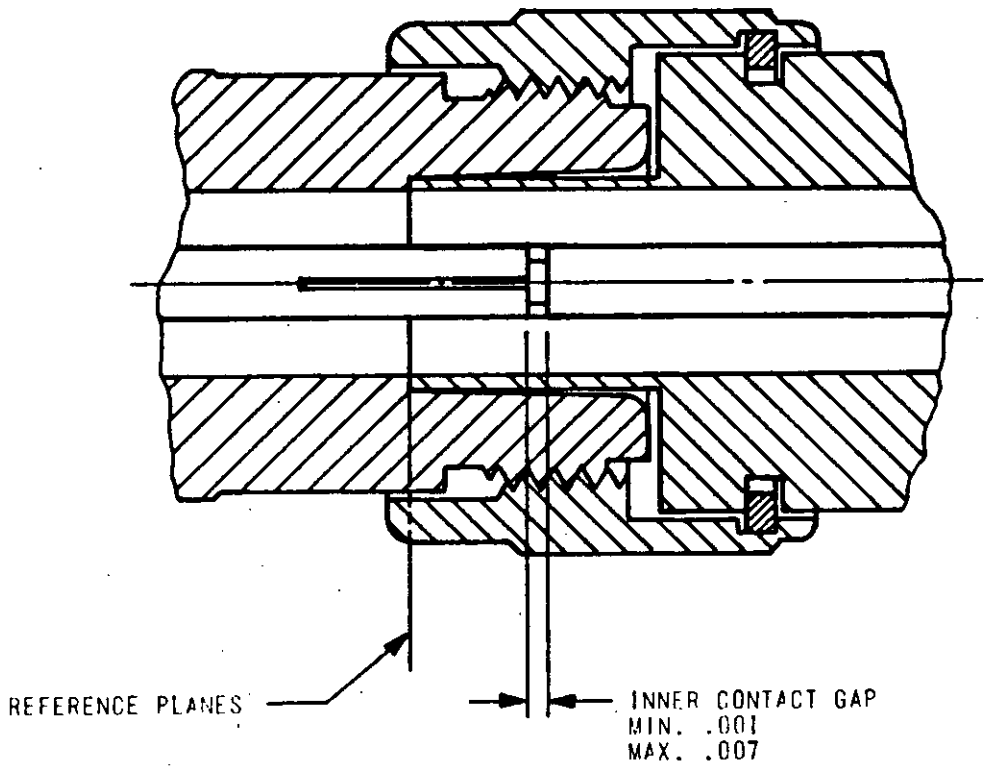


INCHES	MM
.002	.05
.007	.18
.008	.20
.014	.36
.015	.38
.036	.91
.044	1.12

Series C 50 OHMS

FIGURE 10. Gap of mated standard test connector.

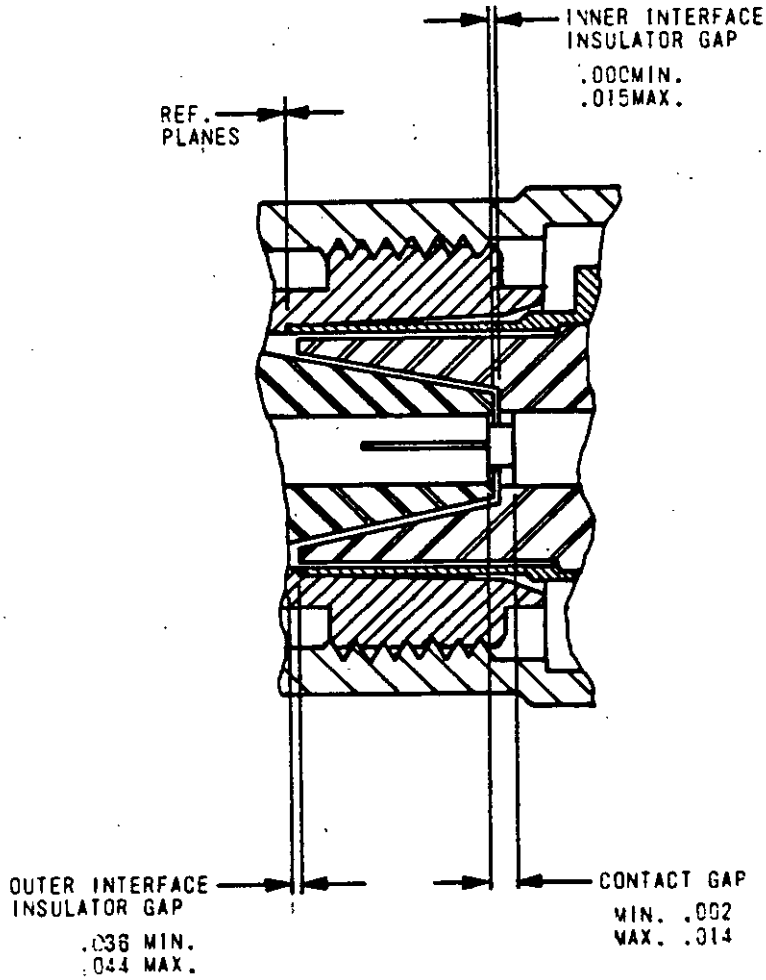
APPENDIX



INCHES	MM
.001	.03
.007	.18

Series N 50 OHMS

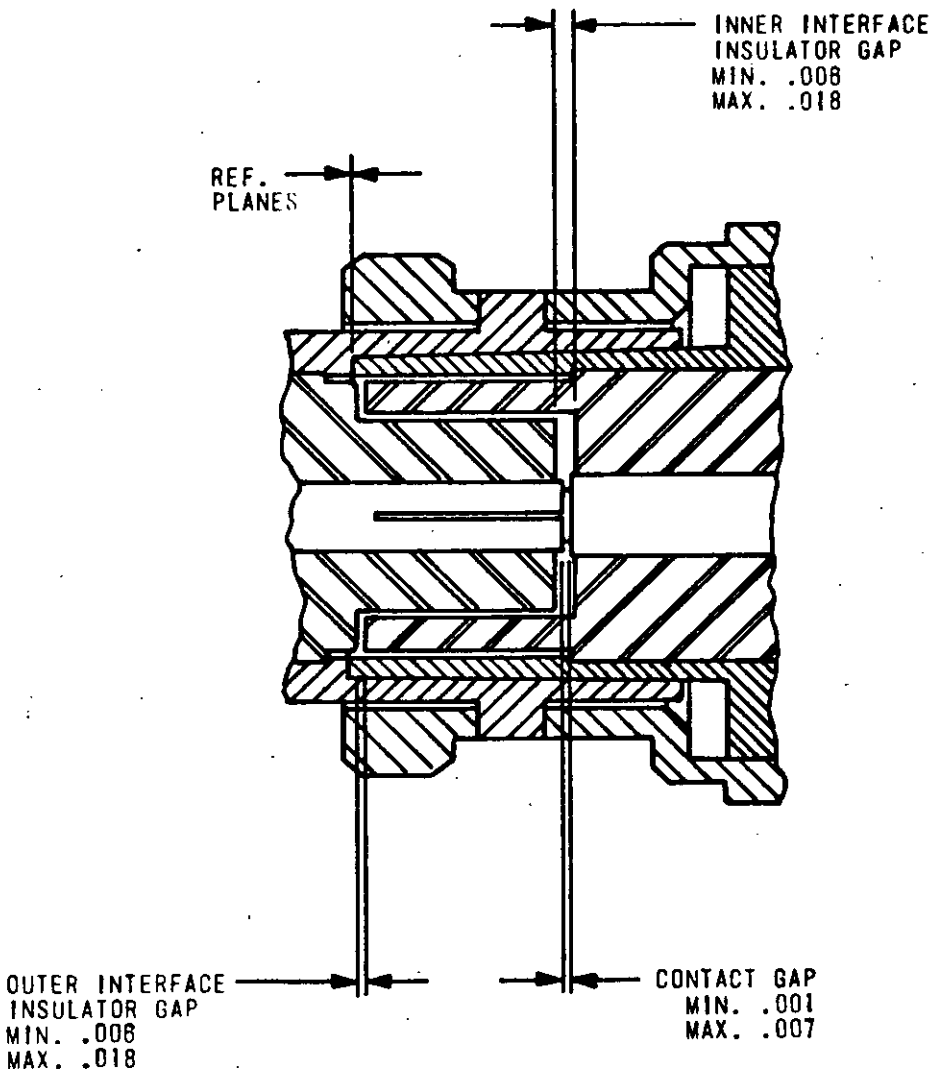
FIGURE 10. Gap of mated standard test connector - Continued.



INCHES	MM
.002	.05
.008	.20
.014	.36
.015	.38
.036	.91
.044	1.12

Series SC 50 OHMS

FIGURE 10. Gap of mated standard test connector - Continued.

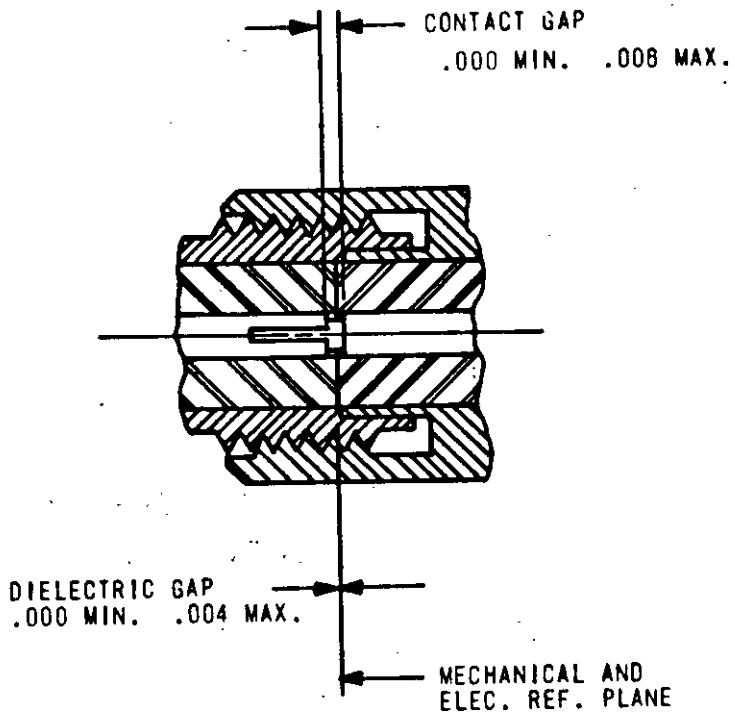


INCHES	MM
.001	.03
.006	.15
.007	.18
.012	.30
.018	.46

Series BNC 50 OHMS

FIGURE 10. Gap of mated standard test connector - Continued.

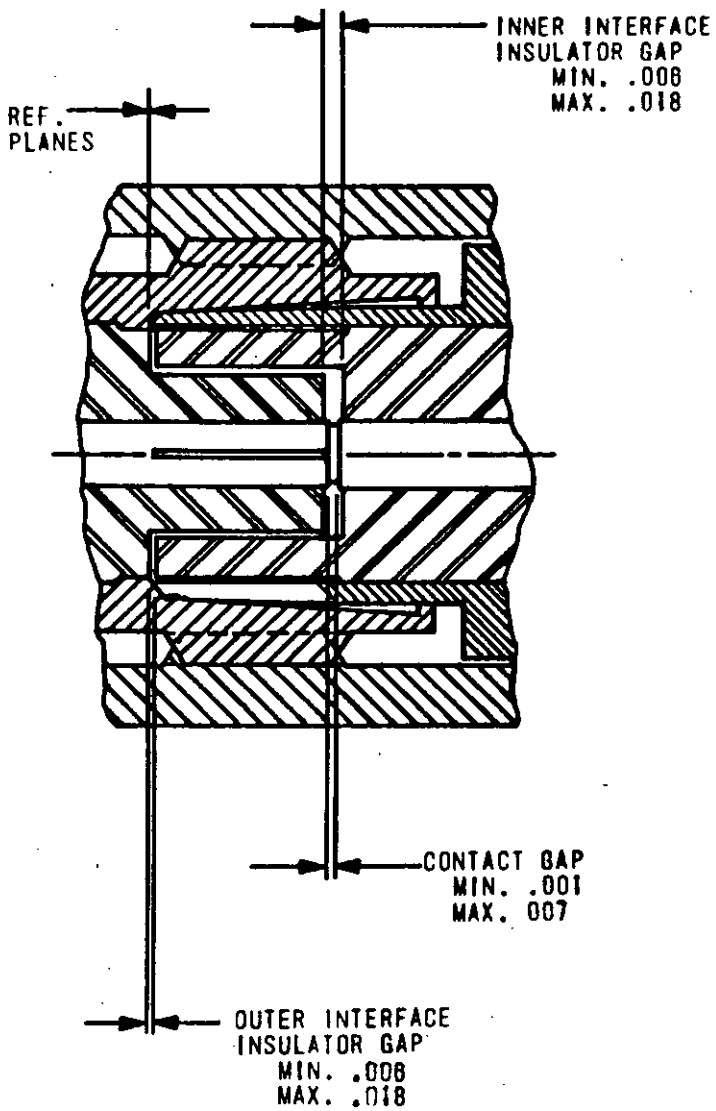
APPENDIX



INCHES	MM
.004	.10
.006	.15

Series SMA 50 OHMS

FIGURE 10. Gap of mated standard test connector - Continued.

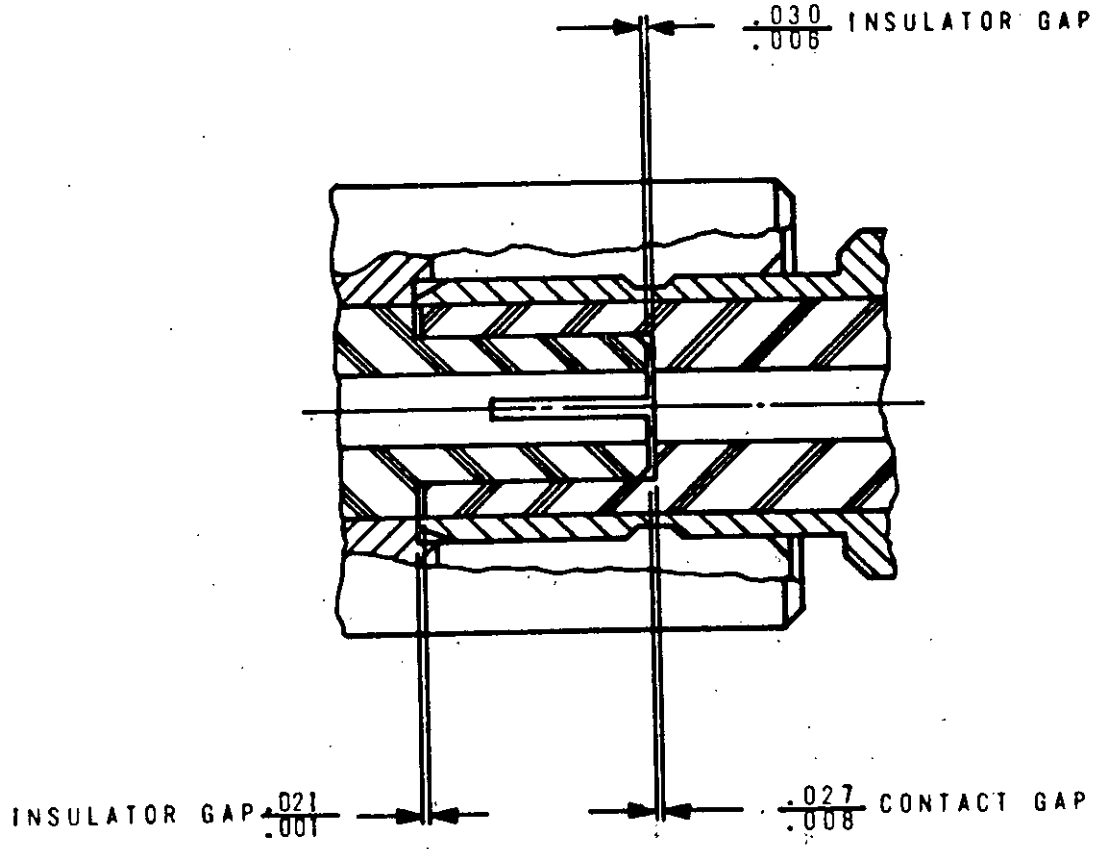


INCHES	MM
.001	.03
.006	.15
.007	.18
.012	.30
.018	.46

Series TNC 50 OHMS

FIGURE 10. Gap of mated standard test connector - Continued.

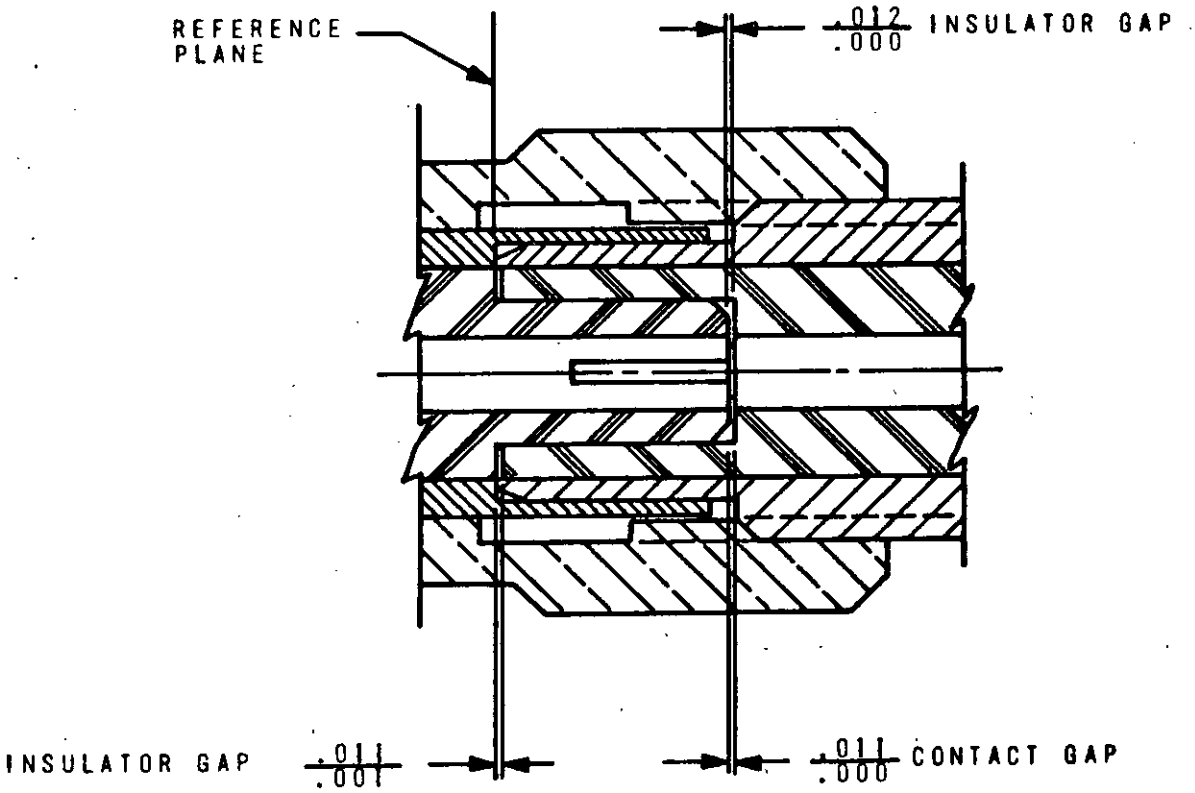
APPENDIX



INCHES	MM
.001	.03
.006	.15
.008	.20
.021	.53
.027	.69
.030	.76

Series SMB 50 OHMS

FIGURE 10. Gap of mated standard test connector - Continued.



INCHES	MM
.001	.03
.011	.28
.012	.30

Series SMC 50 OHMS

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only and are based upon 1 inch = 25.4 mm.

FIGURE 10. Gap of mated standard test connector - Continued.

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