

MIL-A-22641C  
 27 July 1972  
 SUPERSEDING  
 MIL-A-22641B  
 29 November 1971  
 (See 6.4)

## MILITARY SPECIFICATION

### ADAPTERS, COAXIAL TO WAVEGUIDE,

### GENERAL SPECIFICATION FOR

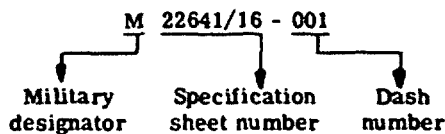
This specification is approved for use by all Departments and Agencies of the Department of Defense.

#### 1. SCOPE

- 1.1 Scope. This specification covers the general requirements for adapters which connect series N connectors to waveguides, 5/8-inch coaxial lines to waveguides, and 7/8-inch coaxial lines to waveguides, series TNC connectors to waveguides, series SMA connectors to waveguides, for general application by the armed services (see 1.2.1, 6.1, and 6.3).

#### 1.2 Classification.

1.2.1 Military part number. The military part number shall consist of the letter "M", the basic number of the specification sheet, and an assigned dash number as shown in the following example (see 3.1):



- \* 1.2.2 Class. For the purpose of this specification, adapters shall be classed as follows (see 3.1):

Class 1 - Coaxial, series N to waveguides.  
 Class 2 - 5/8-inch coaxial lines to waveguides.  
 Class 3 - 7/8-inch coaxial lines to waveguides.  
 Class 4 - Coaxial, series TNC to waveguide.  
 Class 5 - Coaxial, series SMA to waveguide.

#### 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.

#### SPECIFICATIONS

##### FEDERAL

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>* NN-P-71</li> <li>QQ-B-654</li> <li>QQ-S-571</li> <li>QQ-S-781</li> <li>PPP-B-566</li> <li>PPP-B-585</li> <li>PPP-B-601</li> <li>PPP-B-621</li> <li>* PPP-B-636</li> <li>PPP-B-676</li> <li>PPP-T-60</li> <li>PPP-T-76</li> </ul> | <ul style="list-style-type: none"> <li>- Pallets, Material Handling, Wood, Double Faced, Stringer Construction.</li> <li>- Brazing Alloys, Silver.</li> <li>- Solder; Tin Alloy; Lead-Tin Alloy; and Lead Alloy.</li> <li>- Strapping, Steel, Flat and Seals.</li> <li>- Boxes, Folding, Paperboard.</li> <li>- Boxes, Wood, Wirebound.</li> <li>- Boxes, Wood, Cleated-Plywood.</li> <li>- Boxes, Wood, Nailed and Lock-Corner.</li> <li>- Boxes, Shipping, Fiberboard.</li> <li>- Boxes, Setup.</li> <li>- Tape: Packaging, Waterproof.</li> <li>- Tape, Pressure-Sensitive Adhesive Paper. (For Carton Sealing).</li> </ul> |
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## MILITARY

- MIL-P-116 - Preservation, Methods of.
- MIL-F-3922 - Flanges, Waveguide, General Purpose, General Specification for.
- MIL-C-5541 - Chemical Conversion Coatings on Aluminum and Aluminum Alloys.
- MIL-F-14072 - Finish for Ground Signal Equipment.
- MIL-E-15090 - Enamel, Equipment, Light-Gray (Formula No. 111).
- \* MIL-C-39012 - Connectors, Coaxial, Radio frequency; General Specification for.
- MIL-A-22641/16 - Adapters, Coaxial to Waveguide (Series N to Waveguide - Class I), Types UG-397/U, UG-398/U, UG-399/U, UG-400/U, UG-446A/U, UG-952/U, UG-953/U, UG-1004/U, UG-1005/U, UG-1538/U, UG-1646/U, UG-1653/U, UG-1654/U, UG-1655/U, UG-1656/U, UG-1657/U, UG-1658/U, UG-1659/U, UG-1660/U, UG-1661/U, and UG-1679/U.
- MIL-A-22641/17 - Adapters, Coaxial to Waveguide (Class III - 7/8 Inch), Types UG-405/U, UG-522/U, UG-1622/U, and UG-1663/U.
- MIL-A-22641/18 - Adapters, Coaxial to Waveguide (Class II - 5/8 Inch), Types UG-403/U, UG-404/U, UG-445/U, UG-520/U, UG-521/U, UG-523/U, UG-1647/U, UG-1648/U, UG-1649/U, UG-1650/U, UG-1651/U, and UG-1652/U.
- \* MIL-A-22641/19 - Adapters, Coaxial to Waveguide (Series TNC to Waveguide).
- MIL-B-43014 - Boxes: Water Resistant Paperboard; Folding, Set-up and Metal-stayed.
- MIL-C-45662 - Calibration System Requirements.

## STANDARDS

## MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.
- MIL-STD-130 - Identification Marking of US Military Property.
- MIL-STD-147 - Palletized and Containerized Unit Loads 40" x 48" Pallets, Skids, Runners, or Pallet-Type Base.
- MIL-STD-202 - Test Methods for Electronic and Electrical Component Parts.

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

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

## NATIONAL BUREAU OF STANDARDS

- Handbook H28 - Screw-Thread Standards for Federal Services.

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402.)

## 3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheets listed in section 2. In the event of conflict between the requirements of this specification and the specification sheets, the latter shall govern.

3.2 First article. Adapters furnished under this specification shall be products which have been tested and have passed the first article inspection specified in 4.4.

**3.3 Material.** The material shall be as specified in the specification sheet. When a definite material is not specified, a material shall be used which will enable the adapters to meet the performance requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the finished product.

**3.4 Design and construction.** Adapters shall be of the design, construction, and overall physical dimensions specified, and shall be capable of adapting the specified waveguide to the specified coaxial line (see 3.1).

**3.4.1 Metal parts.** All metal parts shall be free from chips, burrs, and scratches in accordance with good commercial practice. Electrical conducting brass parts shall be silver-plated not less than 0.0003-inch thick and then rhodium flashed. The internal surfaces of all aluminum adapters shall be chemically treated in accordance with MIL-C-5541.

**3.4.2 Plastic parts.** All plastic parts shall be free from visible cracks or flaws.

\* **3.4.2.1 Plastic caps.** The waveguide flange and RF connector ends of the adapter are to be sealed with push-on plastic caps to prevent damage and the entrance of moisture and foreign material during storage.

**3.4.3 Threaded parts.** All threaded parts shall be in accordance with Handbook H28.

\* **3.4.4 Connectors.** Connector for a specific adapter shall be as specified (see 3.1). Materials, design, and construction of the connectors shall conform to MIL-C-39012.

**3.4.5 Waveguide flange.** The waveguide flange used with each adapter shall properly mate with the flange specified (see 3.1), which shall conform to MIL-F-3922.

**3.4.5.1 Mating.** No constructional detail of the adapters shall interfere with mating of the waveguide flange with its counterpart.

**3.4.6 Waveguide.** The waveguide used with each adapter shall be of the type specified (see 3.1).

**3.4.6.1 Positioning of the coaxial extension.** The coaxial extension of each adapter shall be positioned on the waveguide so that all the electrical requirements are satisfied; however, since there are multiples of the satisfactory electrical lengths from the end plate which will also satisfy the requirements, the distance from the end plate to the coaxial extension shall be chosen as the shortest length possible.

**3.4.7 Angular alinement.** In assembling flanges to a section of waveguide, 1 inch by 1/2 inch and larger sizes, the flange face shall make an angle of 90 degrees  $\pm$  30 minutes with the E- and H-plane of the internal surfaces of the waveguide; for smaller sizes, the flange face shall make an angle of 90 degrees  $\pm$  15 minutes.

**3.4.8 Brazed or welded joints.** When a sleeve flange is attached to a waveguide by a weld or braze, the flange face shall be machined smooth and shall show no sign of pits, air pockets, or other surface irregularities.

**3.4.9 Soldered joints.** All joints shall be silver soldered except that the end plate may be soft soldered. The silver solder shall conform to QQ-B-654. The soft solder shall conform to composition SN-60 of QQ-S-571. All soldered joints shall be thoroughly cleaned to avoid corrosion.

**3.4.10 Finish.** All exterior surfaces of the adapters, except the mating surface, shall be finished in accordance with finish number P511, type I, with the final film E of MIL-F-14072 conforming to type III, class 2, of MIL-E-15090.

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3.5 Voltage standing wave ratio (VSWR). When adapters are tested as specified in 4.6.2 and 4.6.2.1, the voltage standing wave ratio shall not exceed the values specified (see 3.1).

\* 3.6 RF insertion loss (when specified, see 3.1). When adapters are tested as specified in 4.6.3, the insertion loss shall not exceed that specified (see 3.1).

3.7 Pressurization. When adapters are tested as specified in 4.6.4, there shall be no leakage, as detected by the continuous formation of escaping air bubbles. Air leakage through the RF connector is not acceptable.

\* 3.8 Shock (specified pulse). When adapters are tested as specified in 4.6.5, the VSWR and RF insertion loss shall be as specified (see 3.1).

\* 3.9 Vibration. When adapters are tested as specified in 4.6.6, the VSWR and RF insertion loss shall be as specified (see 3.1), and the pressurization shall be as specified in 3.7.

3.10 Salt spray (corrosion). When adapters are tested as specified in 4.6.7, there shall be no destructive corrosion or pitting. Destructive corrosion is any type of corrosion which in any way interferes with mechanical or electrical performance of the adapter.

3.11 Dielectric withstanding voltage (coaxial end). When adapters are tested as specified in 4.6.8, there shall be no evidence of breakdown.

3.12 Gage. Adapters shall withstand the gage test specified in 4.6.9, as specified for the applicable class.

\* 3.13 Marking. Adapters shall be marked in accordance with MIL-STD-130, with the military part number (see 3.1), and manufacturer's code symbol. The end plate shall include the frequency band, RF insertion loss, and VSWR of the particular adapter (see 3.1). All such markings shall withstand normal abuse and be legible for the life of the adapter. The height of the military part number shall be at least 1/8 inch, but shall not exceed 1/4 inch. The military part number shall be comparable in height to the manufacturer's name or code symbol. Marking shall be applied directly on the adapter in the location specified (see 3.1).

3.14 Workmanship. Adapters shall be processed in such a manner as to be uniform in quality and shall be free from pits, corrosion, cracks, rough edges, chips, burrs, scratches, flaws, 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 supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier 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 facilities of sufficient accuracy, quality and quantity to permit performance of the required inspection shall be established and maintained by the supplier. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with MIL-C-45662.

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

- (a) First article inspection (see 4.4).
- (b) Quality conformance inspection (see 4.5).

4.3 Inspection conditions. Unless otherwise specified herein, all inspections shall be performed in accordance with the test conditions specified in the "GENERAL REQUIREMENTS" of MIL-STD-202.

4.4 First article inspection. First article inspection shall be performed by the supplier, after award of contract and prior to production, at a location acceptable to the Government. First article inspection shall be performed on sample units which have been produced with equipment and procedures normally used in production. First article approval is valid only on the contract or purchase order under which it is granted, unless extended by the Government to other contracts or purchase orders.

4.4.1 Sample size. Three adapters shall be subjected to first article inspection.

- 4.4.2 Inspection routine. The sample shall be subjected to the inspections specified in table I, in the order shown. No failures shall be permitted.

• TABLE I. First article inspection.

Examination or test	Requirement paragraph	Method paragraph	Number of sample units to be inspected
Visual and mechanical examination - - - - -	3.1, 3.3 to 3.4.10, 3.13 and 3.14	4.6.1	} 3
VSWR - - - - -	3.5	4.6.2	
RF insertion loss <sup>1/</sup> - - -	3.6	4.6.3	
Pressurization - - - - -	3.7	4.6.4	
Shock (specified pulse) - -	3.8	4.6.5	
Vibration - - - - -	3.9	4.6.6	
Salt spray (corrosion) - -	3.10	4.6.7	
Dielectric withstanding voltage - - - - -	3.11	4.6.8	
Gage (as applicable) - - -	3.12	4.6.9	

<sup>1/</sup> When specified.

4.5 Quality conformance inspection.

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

4.5.1.1 Inspection lot. An inspection lot shall consist of all adapters of the same military part number, produced under essentially the same conditions, and offered for inspection at one time.

4.5.1.2 Group A inspection. Group A inspection shall consist of visual and mechanical examinations (see 4.6.1).

4.5.1.2.1 Sampling plan. Statistical sampling and inspection shall be in accordance with MIL-STD-105 for general inspection level III. The acceptable quality levels (AQL) shall be 1.0 percent defective for major and minor defects. Major and minor defects shall be as defined in MIL-STD-105.

4.5.1.2.2 Rejected lots. If an inspection lot is rejected, the supplier 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.

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4.5.1.3 Group B inspection. Group B inspection shall consist of the tests specified in table II in the order shown, and shall be made on sample units which have been subjected to and have passed the group A inspection.

4.5.1.3.1 Sampling plan. The sampling plan shall be in accordance with MIL-STD-105 for general inspection, level III. 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 1.0 percent defective.

TABLE II. Group B inspection.

Test	Requirement paragraph	Method paragraph
VSWR - - - - -	3.5	4.6.2
RF insertion loss (when specified) - -	3.6	4.6.3
Pressurization - - - - -	3.7	4.6.4
Gage test (as applicable) - - - - -	3.12	4.6.9

4.5.1.3.2 Rejected lots. If an inspection lot is rejected, the supplier 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.

4.5.1.3.3 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 and the sample units are still within specified electrical tolerances.

\* 4.5.2 Periodic inspection. The periodic inspection shall consist of group C. Except where the results of this inspection show noncompliance with the applicable requirements (see 4.5.2.2.3), delivery of products which have passed groups A and B shall not be delayed pending the results of group C inspection.

4.5.2.1 Group C inspection. Group C inspection shall consist of the tests specified in table III, 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.

TABLE III. Group C inspection.

Test	Requirement paragraph	Method paragraph
Salt spray (corrosion) - - - - -	3.10	4.6.7
Shock (specified pulse) - - - - -	3.8	4.6.5
Vibration - - - - -	3.9	4.6.6
Dielectric withstanding voltage - - - -	3.11	4.6.8

4.5.2.2 Sampling plan. Sample units shall be selected once every 3 months from current production in accordance with table IV. A different set of samples as shown in table IV shall be selected for each class of adapters.

\* TABLE IV. Sampling plan for group C inspection.

Total 3 months' production	Number of sample units to be inspected
Up to 180, inclusive - - - - -	2
181 to 500, inclusive - - - - -	3
501 to 800, inclusive - - - - -	5
801 to 1,300 inclusive - - - - -	7
Over 1,300 - - - - -	10

- \* 4.5.2.2.1 Defectives. If one or more sample units fail to pass group C inspection, the sample shall be considered to have failed.

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

4.5.2.2.3 Noncompliance. If a sample fails to pass group C inspection, the supplier shall take corrective action on the materials or processes, or both, as warranted, and on all units of product which can be corrected and which were manufactured under essentially the same conditions, with essentially the same materials, processes, etc., and which are considered subject to the same failure. Acceptance of the product shall be discontinued until corrective action, acceptable to the Government, has been taken. After the corrective action has been taken, group C inspection shall be repeated on additional sample units (all inspection, or the inspection which the original sample failed, at the option of the Government). Groups A and B inspections may be reinstated; however, final acceptance shall be withheld until the group C reinspection has shown that the corrective action was successful. In the event of failure after reinspection, information concerning the failure and corrective action taken shall be furnished to the cognizant inspection activity and the command or agency concerned.

- \* 4.5.3 Inspection of preparation for delivery. The sampling and inspection of the preservation-packaging and interior package marking shall be in accordance with the group A and B quality conformance inspection requirements of MIL-P-116. The sampling and inspection of the packing and marking for shipment and storage shall be in accordance with the quality assurance provisions of the applicable container specification and the marking requirements of MIL-STD-129.

#### 4.6 Methods of examination and test.

4.6.1 Visual and mechanical examination. Adapters shall be examined to verify that the materials, design, construction, physical dimensions, marking, and workmanship are in accordance with the applicable requirements (see 3.1, 3.3 to 3.4.10, inclusive, 3.13, and 3.14).

4.6.2 VSWR (see 3.5). The VSWR shall be measured over the specified frequency band (see 3.1), using the waveguide as the input end. The VSWR shall again be measured over the specified frequency band (see 3.1), using the series N or coaxial connection (as applicable) as the input end.

4.6.2.1 Procedure. VSWR of the assemblies shall be measured using a system such as shown on figure 1, and shall be no greater than the value specified. Tuners and pads shall be used, where necessary, to reduce residual VSWR of the system to a level which will assure accurate results before connecting the assembly under test.

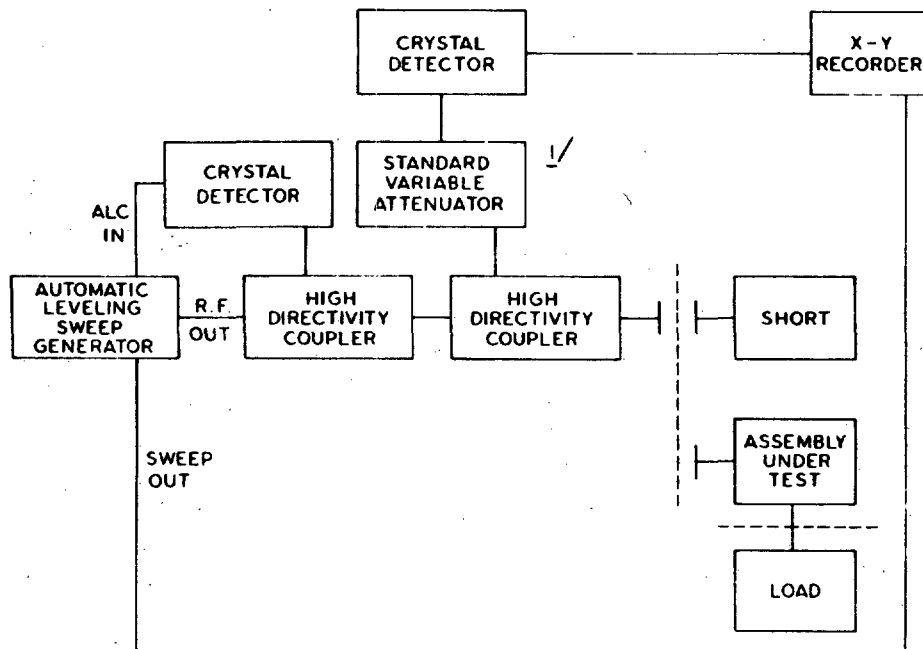
- \* 4.6.3 RF insertion loss (when specified) (see 3.6). The adapter shall be tested as shown in figure 2. Included in the insertion loss of the adapter is the reflection and dissipating loss of two standard test adapters - one for each interface of the adapter under test. Before performing the measurement on the adapter under test, the following two-step checkout procedure shall be performed:

Step 1 - The insertion loss of **1** and **2** of figure 2 shall be measured.

Step 2 - The insertion loss of **4** and **3** shall be measured.

To perform the measurement on the adapter under test, **1**, **5**, and **3** shall be inserted as shown, and the insertion loss shall be measured.

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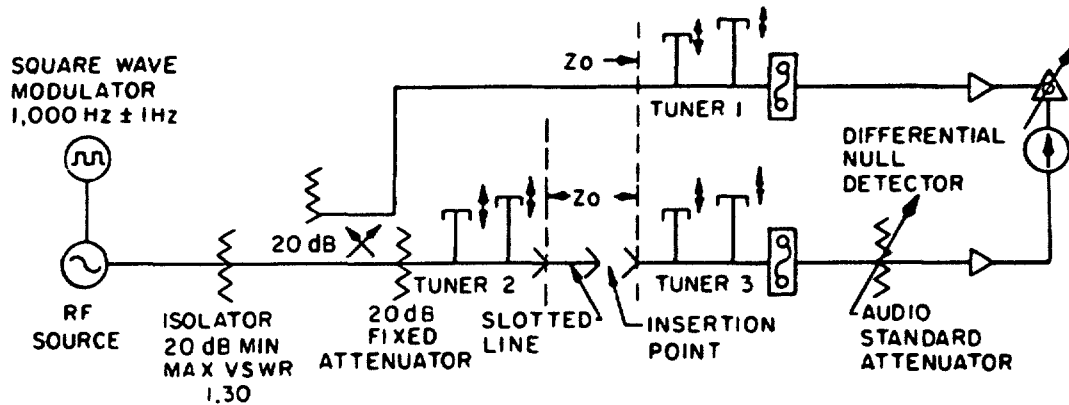


<sup>1/</sup> Use 20 dB pad when calibrating for coaxial end measurements then remove.

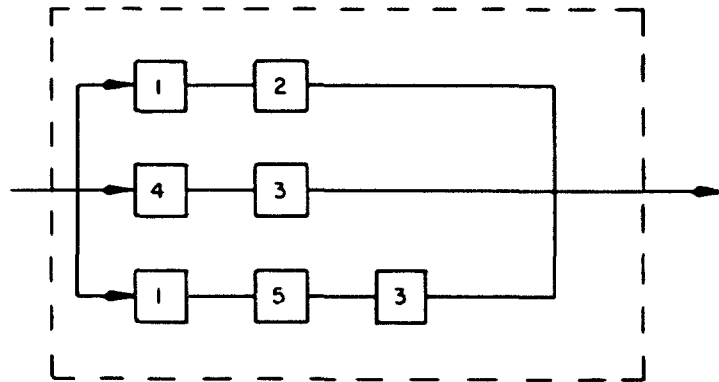
FIGURE 1. VSWR test setup.



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NOTE: Slotted line with low residual reflection, hermaphroditic output fitting compatible with tuner 3 input fitting. VSWR less than  $1.006 + .003F$  ( $F$  in GHz).



**NOTES:**

1. Standard test adapter with hermaphroditic input fitting compatible with output fitting of slotted line, and output interface compatible with input interface of adapter to be tested.
2. Standard test adapter of opposite sex to **1** and hermaphroditic output fitting compatible with input fitting of tuner 3.
3. Standard test adapter with hermaphroditic output fitting compatible with input fitting of tuner 3, and input interface compatible with output interface of adapter to be tested.
4. Standard test adapter of opposite sex to **3** and hermaphroditic input fitting compatible with output fitting of the slotted line.
5. Adapter under test.

FIGURE 2. Method of insertion loss measurement.

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4.6.4 Pressurization (see 3.7). With the waveguide end properly sealed, adapters shall be subjected to the internal gas pressure specified (see 3.1) for a period of at least 20 seconds while immersed in tap water at a temperature of approximately 20° C. Where no limits are specified (see 3.1), the internal gas pressure shall be 30 pounds per square inch. During immersion, the adapters shall be observed for evidence of leakage as indicated by escaping air bubbles.

\* 4.6.5 Shock (specified pulse) (see 3.8). Adapters shall be tested in accordance with method 213, test condition G, of MIL-STD-202, with requirements of one shock applied to each of the three mutually perpendicular axes of the test specimen. After this test, VSWR and insertion loss shall be measured as specified in 4.6.2, 4.6.2.1, and 4.6.3.

4.6.6 Vibration (see 3.9). Adapters shall be tested in accordance with method 201 of MIL-STD-202. The following details and exceptions shall apply:

- (a) Initial measurements - Not applicable.
- (b) Method of mounting - Adapters shall be attached to the vibration table by a clamp. No part of the adapter shall touch any object other than the clamp.
- (c) Direction of motion - One hour in each of three mutually perpendicular directions (total of 3 hours).
- \* (d) Final measurements - After this test, VSWR and insertion loss shall be measured as specified in 4.6.2, 4.6.2.1, and 4.6.3 and the pressurization test shall be performed as specified in 4.6.4.

\* 4.6.7 Salt spray (corrosion) (see 3.10). Unless otherwise specified (see 3.1), adapters shall be tested in accordance with method 101 of MIL-STD-202. The following details and exceptions shall apply:

- (a) Applicable salt solution - 5 percent.
- (b) Test condition - A.
- (c) Examination after test - Adapters shall be washed, dried, and examined for destructive corrosion or pitting.

4.6.8 Dielectric withstanding voltage (see 3.11). Adapters shall be tested in accordance with method 301 of MIL-STD-202. The following details shall apply:

- (a) Special preparations or conditions:
  - (1) The temperature shall be approximately 23° C (73.4° F); the pressure shall be approximately 30 inches of mercury absolute; the maximum relative humidity shall be 50 percent. When facilities are not available for these specified test conditions, the adapters shall be tested at the prevailing atmospheric conditions. In case of dispute, retest shall be made at the specified test conditions.
  - (2) Precautions shall be taken to prevent air-gap voltage breakdown.
- (b) Magnitude of test voltage - 1,500 volts root mean square instantaneously applied, except for Class 5 adapters in which case 1,000 volts root mean square shall be applied.
- (c) Nature of potential - Alternating current.
- (d) Points of application of test voltage - Between the center conductor and the outer shell of the adapter.
- (e) Examination - After the test, adapters shall be examined for evidence of breakdown.

\* 4.6.9 Gage test (as applicable) (see 3.12).

\* 4.6.9.1 Class 1, 4, and 5 adapters. Class 1, 4 or 5 adapters shall be rigidly mounted in a suitable jig or fixture and the applicable mating characteristics specified in table V shall be measured. For measurements of required forces; a gage containing the test pin and a suitable force indicating dial shall be aligned to within 0.004 TIR of any plane passing through the axis of the center contact. Insertion or withdrawal of the test pin shall be made smoothly and at such a rate that the dial does not bounce or otherwise give a false reading. The test pin may be chamfered to facilitate entry, but the specified insertion length shall not include the chamfer length and the finish shall be 16 micro-inches.

\* TABLE V. Mating characteristics.

Test	Class 1	Class 4	Class 5
Oversize test pin	.074 + .0001 inch diameter (nonclosed entry contact only)	.057 + .0001 inch diameter (nonclosed entry contact only)	.0375 + .0001 inch diameter
Insertion depth	.125 inch minimum	.125 inch minimum	.030/.045 inch
Number of insertions	1	1	3
Max diameter test pin	Steel test pin diameter .066 + .0001 inch	Steel test pin diameter .054 + .0001 inch	Steel test pin diameter .0370 + .0001 inch (Insertion depth - .050/.075)
Insertion force	2 lbs maximum	2 lbs maximum	3 lbs maximum
Min diameter test pin	Steel test pin diameter .063 - .0001 inch	Steel test pin diameter .052 - .0001 inch	.0355 - .0001 inch diameter (Insertion depth - .050/.075)
Withdrawal force	2 ounces minimum	2 ounces minimum	1 ounce minimum

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4.6.9.2 Class 2 adapters. For class 2 adapters, the gage test shall be as follows:

- (a) The 5/8-inch coaxial female fittings shall be equivalent to standard female coupling UG-141/U, and shall be capable of properly mating with a 5/8-inch coaxial male fitting which is equivalent to a standard male coupling UG-140/U.
- (b) The 5/8-inch coaxial male fittings shall be equivalent to standard male coupling UG-140/U, and shall be capable of properly mating with a standard female coupling UG-141/U.
- (c) Mating shall be considered accomplished after 25 successful insertions and withdrawals.

4.6.9.3 Class 3 adapters. For class 3 adapters, the gage test shall be as follows:

- (a) The 7/8-inch coaxial female fittings shall be equivalent to standard female coupling UG-46/U, and shall be capable of properly mating with a 7/8-inch coaxial male fitting which is equivalent to a standard male coupling UG-45/U.
- (b) The 7/8-inch coaxial male fittings shall be equivalent to standard male coupling UG-45/U, and shall be capable of properly mating with a standard female coupling UG-46/U.
- (c) Mating shall be considered accomplished after 25 successful insertions and withdrawals.

## 5. PREPARATION FOR DELIVERY

(The preparation for delivery requirements specified herein apply only for direct Government procurements. Preparation for delivery requirements of referenced documents listed in section 2 do not apply unless specifically stated in the contract or order. Preparation for delivery requirements for products procured by contractors shall be specified in the individual orders.)

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

### 5.1.1 Level A.

5.1.1.1 Cleaning. Adapters shall be cleaned in accordance with MIL-P-116, process C-1.

5.1.1.2 Drying. Adapters shall be dried in accordance with MIL-P-116.

5.1.1.3 Preservative application. Preservatives shall not be used.

5.1.1.4 Unit packaging. Adapters shall be individually packaged in accordance with MIL-P-116, submethod IIc insuring compliance with the general requirements paragraph under method of preservation (unit protection) and the physical protection requirements paragraph therein. Each unit package shall be placed in a supplementary container conforming to PPP-B-566 or PPP-B-676.

5.1.1.5 Intermediate packaging. Not required.

\* 5.1.2 Level C. Adapters shall be clean, dry and individually packaged in a manner that will afford adequate protection against corrosion, deterioration and physical damage during shipment from supply source to the first receiving activity.

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

5.2.1 Level A. The packaged adapters shall be packed in fiberboard containers conforming to PPP-B-636, class weather resistant, style optional, special requirements. In lieu of the closure and waterproofing requirements in the appendix of PPP-B-636, closure and waterproofing shall be accomplished by sealing all seams, corners and manufacturer's joint with tape, two inches minimum width, conforming to PPP-T-60, class 1 or PPP-T-76. Banding (reinforcement requirements) shall be applied in accordance with the appendix to PPP-B-636 using nonmetallic or tape banding only.

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5.2.2 Level B. The packaged adapters shall be packed in fiberboard containers conforming to PPP-B-636, class domestic, style optional, special requirements. Closures shall be in accordance with the appendix thereto.

5.2.3 Level C. The packaged adapters shall be packed in shipping containers in a manner that will afford adequate protection against damage during direct shipment from the supply source to the first receiving activity. These packs shall conform to the applicable carrier rules and regulations.

5.2.4 Unitized loads. Unitized loads, commensurate with the level of packing specified in the contract or order, shall be used whenever total quantities for shipment to one destination equal 40 cubic feet or more. Quantities less than 40 cubic feet need not be unitized. Unitized loads shall be uniform in size and quantities to the greatest extent practicable.

5.2.4.1 Level A. Adapters, packed as specified in 5.2.1, shall be unitized on pallets in conformance with MIL-STD-147, load type I, with a fiberboard cap (storage aid 4) positioned over the load.

5.2.4.2 Level B. Adapters, packed as specified in 5.2.2, shall be unitized as specified in 5.2.4.1 except that the fiberboard caps shall be class domestic.

5.2.4.3 Level C. Adapters, packed as specified in 5.2.3, shall be unitized with pallets and caps of the type, size and kind commonly used for the purpose and shall conform to the applicable carrier rules and regulations.

5.3 Marking. In addition to any special marking required by the contract or purchase order (see 6.2), each unit package, supplementary and exterior container and unitized load shall be marked in accordance with MIL-STD-129.

#### 5.4 General.

5.4.1 Exterior containers. Exterior containers (see 5.2.1, 5.2.2 and 5.2.3) shall be of a minimum tare and cube consistent with the protection required and shall contain equal quantities of identical stock numbered items to the greatest extent practicable.

#### 5.4.2 Army procurements.

5.4.2.1 Level A unit packaging. All supplementary containers shall either be weather (or water) resistant or overwrapped with waterproof barrier materials. Containers conforming to PPP-B-566 or PPP-B-676 shall be overwrapped with waterproof barrier materials or shall conform to MIL-B-43014 (see 5.1.1.4).

\* 5.4.2.2 Level A and B packing. For level A packing when quantities per destination are less than a unitized load, the fiberboard containers shall not be banded but shall be placed in a close fitting box conforming to PPP-B-601, overseas type; PPP-B-621, class 2, style 4 or PPP-B-585, class 3, style 2 or 3. Closure and strapping shall be in accordance with applicable container specification except that metal strapping shall conform to QQ-S-781, type I, class B. When the gross weight exceeds 200 pounds or the container length and width is 48 x 24 inches or more and the weight exceeds 100 pounds, 3 x 4 inch skids (laid flat) shall be applied in accordance with the requirements of the container specification. If not described in the container specification, the skids shall be applied in a manner which will adequately support the item and facilitate the use of material handling equipment. For level B packing, fiberboard boxes shall be weather resistant as specified in level A and the containers shall be banded (see 5.2.1 and 5.2.2).

\* 5.4.2.3 Level A and B unitization. For level A and B unitization, the fiberboard caps shall be weather resistant and softwood pallets conforming to NN-P-71, type IV, size 2 shall be used (see 5.2.4.1 and 5.2.4.2).

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5.4.3 Navy procurements. For Navy procurements the use of polystyrene loose fill material (such as strips, strands and beads) is prohibited for packaging and packing applications.

## 6. NOTES

6.1 Intended use. Adapters covered by this specification are intended for use in the microwave region of the frequency spectrum (see 3.1).

6.2 Ordering data. Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Title, number, and date of the applicable specification sheet and the military part number (see 3.1).
- (c) Levels of preservation-packaging and packing required (see 5.1 and 5.2).
- (d) Special marking, if required (see 5.3).

6.3 Engineering information. Illustrations and additional engineering information for currently available adapters are included in MIL-HDBK-216, RF Transmission Lines and Fittings. Copies are available upon request from the Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120. Such additional information is not to be considered a contractual requirement.

- \* 6.4 Changes from previous issue. The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

### Custodians:

Army - EL  
Navy - EC  
Air Force - 80

### Review activities:

Army - MI, MU, SL  
Navy -  
Air Force - 17  
DSA - ES

### User activities:

Army - WC, AV  
Navy - MC, SH, AS, OS  
Air Force -

### Preparing activity:

Navy - EC

### Agent:

DSA - ES

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