

MIL-W-3970C
 1 April 1983
 SUPERSEDING
 MIL-W-3970B
 4 April 1977

MILITARY SPECIFICATION
WAVEGUIDE ASSEMBLIES, RIGID,
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 rigid waveguide assemblies, hereinafter referred to as "assemblies" (see 6.1).

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 Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation, form a part of this specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

- | | | |
|-----------|---|--------------------------------------|
| PPP-B-566 | - | Box, Folding, Paperboard. |
| PPP-B-585 | - | Boxes, Wood, Wirebound. |
| PPP-B-601 | - | Boxes, Wood, Cleated-Plywood. |
| PPP-B-621 | - | Boxes, Wood, Nailed and Lock-Corner. |
| PPP-B-636 | - | Boxes, Shipping, Fiberboard. |
| PPP-B-676 | - | Boxes, Setup. |

MILITARY

- | | | |
|-------------|---|---|
| MIL-W-85 | - | Waveguides, Rigid, Rectangular, General Specification for. |
| MIL-P-116 | - | Preservation, Methods of. |
| MIL-F-3922 | - | Flanges, Waveguide, General Purpose, General Specification for. |
| MIL-F-14072 | - | Finishes for Ground Electronic Equipment. |
| MIL-W-23351 | - | Waveguides, Single Ridge and Double Ridge, General Specification for. |
| MIL-F-39000 | - | Flanges, Waveguide, Ridge, General Specification for. |

(See Supplement 1 for list of associated specification sheets.)

STANDARDS

MILITARY

- | | | |
|---------------|---|--|
| MIL-STD-129 | - | Marking for Shipment and Storage. |
| MIL-STD-147 | - | Palletized Unit Loads. |
| MIL-STD-202 | - | Test Methods for Electronic and Electrical Component Parts. |
| MIL-STD-794 | - | Part and Equipment, Procedures for Packaging and Packing of. |
| MIL-STD-889 | - | Dissimilar Metals. |
| MIL-STD-1285 | - | Marking of Electrical and Electronic Parts. |
| MIL-STD-45662 | - | Calibration Systems Requirements. |

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Naval Electronic Systems Command, ATTN: ELEX 8111, Department of the Navy, Washington, DC 20360 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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(Copies of specifications, standards, 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 forms a part of this specification to the extent specified herein. The issues of the document which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

Y14.5 - 1973 - Dimensioning and Tolerancing.

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

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

2.3 Order of precedence In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

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. Assemblies covered by specification sheets furnished under this specification shall be products which are qualified for listing on the qualified products list at the time set for the opening of bids (see 4.5 and 6.3). When there are no products listed or approved for listing on the qualified products list, the qualification requirement may be waived only by the preparing activity, and acquiring activities shall invoke first article inspection.

3.3 First article. Assemblies furnished under this specification which are not listed on qualified products list shall be products that have been tested and passed first article inspection (see 4.6 and 6.4).

3.4 Materials. Materials shall be as specified herein; however, when a definite material is not specified, a material shall be used which will enable the assemblies to meet the performance requirements of this specification. Acceptance or approvals of any constituent material shall not be construed as a guaranty of the acceptance of the finished product.

3.4.1 Dissimilar metals. Unless suitably protected against electrolytic corrosion, dissimilar metals shall not be used in intimate contact with each other. Dissimilar metals are defined in MIL-STD-889.

3.4.2 Finish.

3.4.2.1 Aluminum and aluminum alloy surfaces. Except for interior and mating surfaces, all aluminum or aluminum alloy surfaces shall be finished in accordance with MIL-F-14072, type 1, finish P5138.

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3.4.2.2 Copper or copper alloy surfaces. Except for interior and mating surfaces, all copper or copper alloy surfaces shall be finished in accordance with MIL-F-14072, type I, finish P213B.

3.5 Design and construction. Assemblies shall be of the design, construction, and physical dimensions specified (see 3.1). Dimensions and tolerances shall be interpreted in accordance with ANSI Y14.5 - 1973.

3.5.1 Flanges. Flanges used as a part of the assembly (see 3.1) shall conform to the requirements of MIL-F-3922 or MIL-F-39000.

3.5.2 Waveguides. Waveguides used as a part of the assembly (see 3.1) shall conform to the requirements of MIL-W-85 or MIL-W-23351.

3.6 Voltage standing wave ratio (VSWR). When assemblies are tested as specified in 4.8.2, the VSWR shall not exceed the value specified (see 3.1).

3.7 Insertion loss. When assemblies are tested as specified in 4.8.3, the insertion loss shall not exceed the value specified (see 3.1).

3.8 Pressurization. When assemblies are tested as specified in 4.8.4, there shall be no leakage. Following the test, VSWR shall be as specified in 3.6.

3.9 Salt spray (corrosion). When assemblies are tested as specified in 4.8.5, there shall be no evidence of destructive corrosion and the VSWR and insertion loss shall be as specified in 3.6 and 3.7, respectively. Destructive corrosion shall be construed as any type of corrosion that interferes with mechanical or electrical performance.

3.10 Vibration, high frequency. When assemblies are tested as specified in 4.8.6, there shall be no physical damage to the assembly. Following this test, VSWR, insertion loss, and pressurization shall be as specified in 3.6, 3.7, and 3.8, respectively.

3.11 Shock (specified pulse). When assemblies are tested as specified in 4.8.7, there shall be no physical damage to the assembly. Following this test, VSWR, insertion loss, and pressurization shall be as specified in 3.6, 3.7, and 3.8, respectively.

3.12 Power handling capability (when specified, see 3.1). When assemblies are tested as specified in 4.8.8, there shall be no evidence of arcing, flashover, charring, breakdown, or overheating. After this test, VSWR and insertion loss shall be as specified in 3.6 and 3.7, respectively.

3.13 Marking. Assemblies shall be marked in accordance with MIL-STD-1285, method I, on the external surface, with the military part number (see 3.1), and the manufacturer's source code. Marking characters shall be approximately 1/8 inch in height for assemblies covering frequencies up to 26.5 GHz and approximately 1/16 inch in height for assemblies covering frequencies above 26.5 GHz. The manufacturer's name or trademark may also be marked on the assembly provided such letters are not expressly forbidden in the contract or purchase order. The preferred and permissible marking is as follows:

Preferred:	Military part number: M3970/1-XX-XXXX
	Manufacturer's source code: ZZZZZ
Permissible:	M3970/ 1-XX-XXXX ZZZZZ

3.14 Workmanship. Assemblies shall be manufactured in such a manner as to be uniform in quality and the assembly shall be free from tool marks, burrs, deep scratches, pits, corrosion, cracks, rough edges, chips, and other defects that will affect life, serviceability, or appearance.

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4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract, 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 facilities 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. Materials inspection (see 4.3).
- b. Qualification inspection (see 4.5).
- c. First article inspection (see 4.6).
- d. Quality conformance inspection (see 4.7).

4.3 Materials inspection. Materials inspection shall consist of certification supported by verifying data that the materials (see 3.4) used in fabricating the assembly are in accordance with the applicable referenced specifications or requirements prior to such fabrication.

4.4 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.

4.4.1 Test method deviation. Deviation from the specified test methods are allowed provided that it is demonstrated to the preparing activity or their agent that such deviations in no way relax the requirements of this specification and that they are approved before testing is performed. For proposed test deviations, test method comparative error analysis shall be made available for checking by the preparing activity or their agent.

4.5 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the Government (see 6.3) on sample units produced with equipment and procedures normally used in production. Qualification obtained for each group (see appendix) shall constitute qualification for all assemblies within that specific group.

4.5.1 Sample size. One each of the qualification part number(s) (see appendix) in a group, for which qualification is sought shall be subjected to qualification inspection.

4.5.2 Inspection routine. Sample units(s) shall be subjected to the qualification inspection specified in table 1, in the order shown.

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

4.5.4 Disposition of qualification sample units. Sample units(s) which have been subjected to qualification testing shall not be delivered on any contract or purchase order. The Government reserves the right to retain the sample unit(s) or to require the contractor to furnish the sample unit(s) with the qualification inspection report.

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4.5.5 Retention of qualification. To retain qualification, the contractor shall forward a report at 60-month intervals to the qualifying activity. The qualifying activity shall establish the initial reporting date. The report shall consist of.

- a. A summary of the results of the tests performed for inspection of product for delivery (group A) 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 tests performed for periodic inspection (group B), including the number and mode of failures. The test report shall include results of all periodic inspection tests performed and completed during the 60-month period. If the test results indicate 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 60-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 60-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 occurred during the reporting period, a report shall be submitted certifying that the company still has the capabilities and facilities necessary to produce the assemblies. If during two consecutive reporting periods there has been no production, the manufacturer may be required, at the discretion of the qualifying activity, to submit the qualified products to testing in accordance with the qualification inspection requirements and the reason for no production.

4.6 First article inspection. First article inspection shall be performed by the contractor after award of contract and prior to production, at a location acceptable to the Government. This inspection consists of meeting all the qualification requirements of 4.5 through 4.5.4 inclusive and table I. First article approval is valid only on the contract or purchase order under which it is granted. The grouping of 4.5 does not apply for first article inspection.

TABLE I. Qualification inspection.

Inspection	Requirement paragraph	Method paragraph
Visual and mechanical inspection - - -	3.1, 3.4, 3.5, 3.13 and 3.14	4.8.1
VSWR - - - - -	3.6	4.8.2
Insertion loss - - - - -	3.7	4.8.3
Pressurization - - - - -	3.8	4.8.4
Salt spray (corrosion) - - - - -	3.9	4.8.5
Vibration, high frequency - - - - -	3.10	4.8.6
Shock (specified pulse) - - - - -	3.11	4.8.7
Power handling capability (when specified) - - - - -	3.12	4.8.8

4.7 Quality conformance inspection.

4.7.1 Inspection of product for delivery. Inspection of product for delivery shall consist of groups A and B inspections.

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

4.7.1.2 Group A inspection. Group A inspection shall consist of the inspections specified in table II in the order shown.

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4.7.1.2.1 Sampling plan. All units shall be subjected to group A inspection. No failures are allowed. If one or more sample units fail, the sample shall be considered to have failed.

4.7.1.2.2 Rejected lots (group A inspection). If an inspection lot is rejected, the contractor may rework it to correct the defects or screen out the defective units, and resubmit for reinspection. Such lots shall be separate from new lots and shall be clearly identified as reinspected lots.

TABLE II. Group A inspection.

Inspection	Requirement paragraph	Test method paragraph
Visual and mechanical inspection-	3.1, 3.4, 3.5 3.13 and 3.14	4.8.1
VSWR - - - - -	3.6	4.8.2

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

TABLE III. Group B inspection.

Inspection	Requirement paragraph	Method paragraph
Insertion loss - - - - -	3.7	4.8.3
Pressurization - - - - -	3.8	4.8.4

4.7.1.3.1 Sampling plan (group B inspection). The sampling plan shall be as specified in table IV.

TABLE IV. Group B sampling plan.

Quantity	Units tested
1 - 5	0 ^{1/}
6 - 50	1
51 - 99	2
100 and greater	2%

^{1/} After three consecutive buys of five units or less over a period of 18 months, at least one unit shall be subjected to group B inspection on the fourth buy.

4.7.1.3.2 Rejected lots (group B inspection). If an inspection lot is rejected, the contractor may rework it to correct the defects, or screen out the defective units, and resubmit for reinspection. Such lots shall be separate from new lots, and shall be clearly identified as reinspected lots.

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

4.7.2 Inspection of packaging. The sampling and inspection of the preservation and interior package marking shall be in accordance with the groups 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.

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4.8 Methods of inspection.

4.8.1 Visual and mechanical inspection. Assemblies shall be inspected to verify that the materials, design, construction, physical dimensions, finish, marking, and workmanship are in accordance with the applicable requirements (see 3.1, 3.4, 3.5, 3.13 and 3.14).

4.8.2 VSWR (see 3.6). The VSWR of the assembly shall be measured over the specified frequency range (see 3.1), using the test set-up of figure 1 or figure 2. The test equipment(s) shall be capable of providing a continuous measurement of VSWR over the required frequency ranges. A means shall be provided for producing a permanent record of the assembly's VSWR versus frequency. If VSWR is not directly measured; that is, if return loss is measured and VSWR is calculated from that measurement, the permanent record shall indicate the worst case VSWR numerically for each frequency band and shall provide the calculation used to obtain the calculated VSWR. The measurement system and permanent record shall provide a minimum accuracy of .04 dB over the frequency ranges below 26.5 GHz and a minimum accuracy of .08 dB over the frequency ranges 26.5 GHz and above.

4.8.3 Insertion loss (see 3.7). The insertion loss of the assembly shall be measured over the specified frequency range (see 3.1), using the test set-up of figure 3. The test equipment(s) shall be capable of providing a continuous measurement of insertion loss over the required frequency ranges. A means shall be provided for producing a permanent record of the assembly's insertion loss versus frequency. The measurement system and permanent record shall provide a minimum accuracy of .08 dB over the frequency ranges .32 through 2.6 GHz and above 26.5 GHz and .04 dB over the frequency ranges 2.6 through 26.5 GHz.

4.8.4 Pressurization (see 3.8). The assembly shall be subjected to the internal air pressure in pound-force (lbf) specified (see 3.1), while immersed in water. The temperature of the water shall be $20^{\circ} \pm 5^{\circ}\text{C}$. Any bubbles coming from within the assembly shall be considered as leakage. Bubbles which are the result of entrapped air on the exterior parts of the assembly shall not be considered as leaks. After the test VSWR shall be measured as specified in 4.8.2.

4.8.5 Salt spray (corrosion) (see 3.9). Assemblies shall be tested in accordance with MIL-STD-202, method 101. The waveguide ends should be capped prior to this test. The following details shall apply.

- a. Special mounting - Not applicable.
- b. Test condition letter - B.
- c. Measurements after exposure - VSWR and insertion loss shall be measured as specified in 4.8.2 and 4.8.3, respectively. The assembly shall be visually inspected for evidence of destructive corrosion.

4.8.6 Vibration, high frequency (see 3.10). Assemblies shall be tested in accordance with MIL-STD-202, method 204. The following details shall apply:

- a. Mounting - Rigidly mounted to an appropriate nonresonant mounting table.
- b. Electrical load - Not applicable.
- c. Test condition letter - A.
- d. Resonance - Not applicable.
- e. Measurements after vibration. VSWR, insertion loss, and pressurization shall be measured as specified in 4.8.2, 4.8.3, and 4.8.4, respectively.

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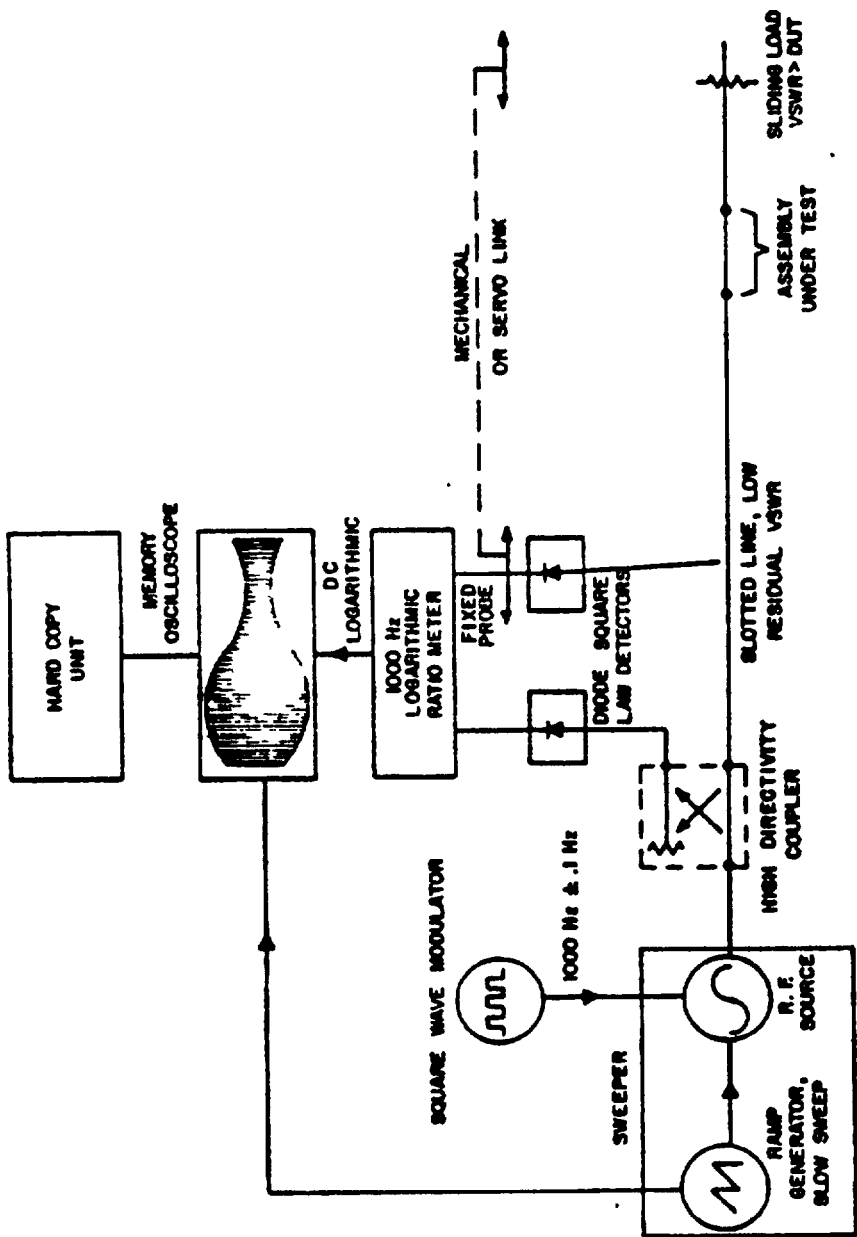


FIGURE 1. VSWR test using coupled sliding load.

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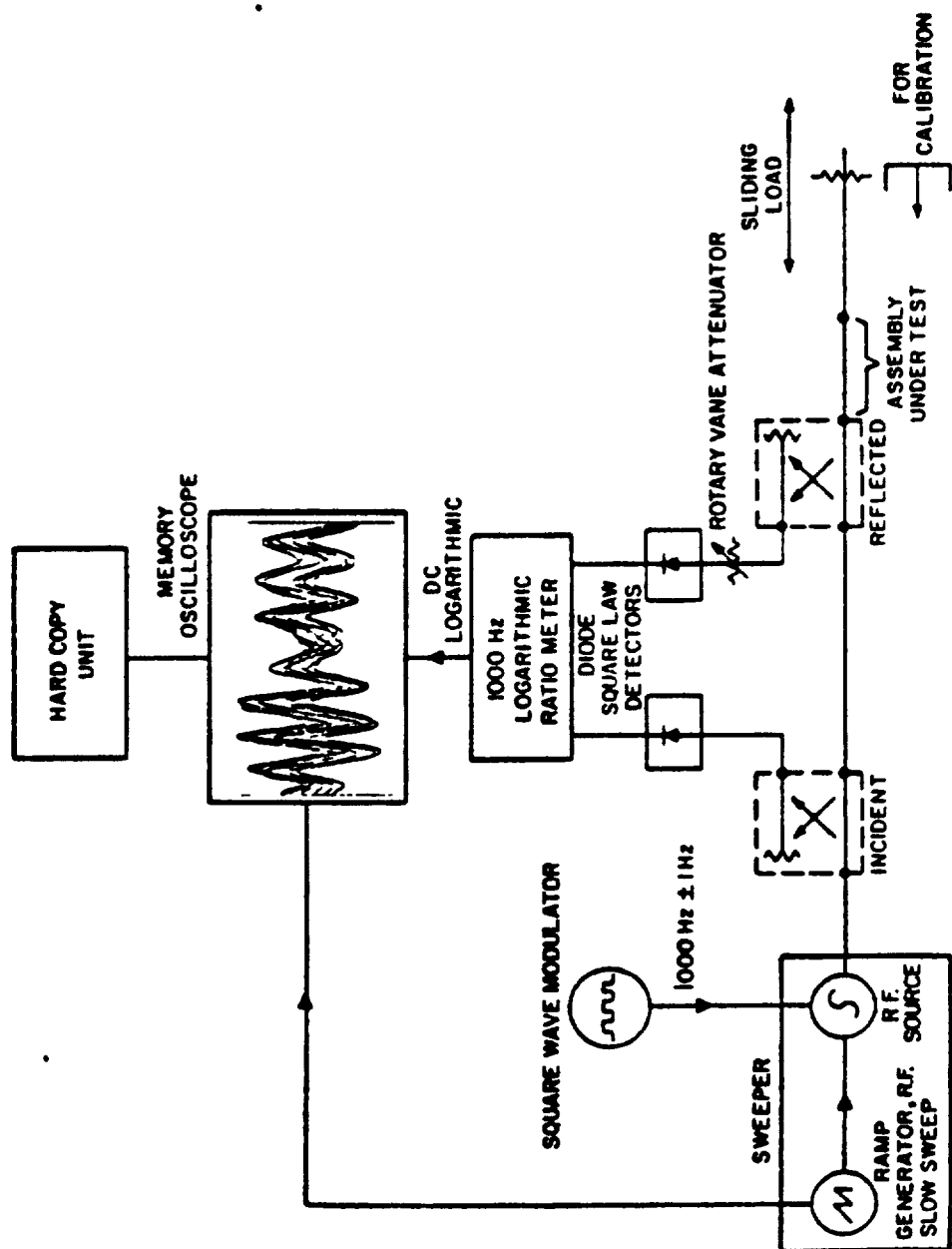


FIGURE 2. VSWR test using reflectometer with sliding load

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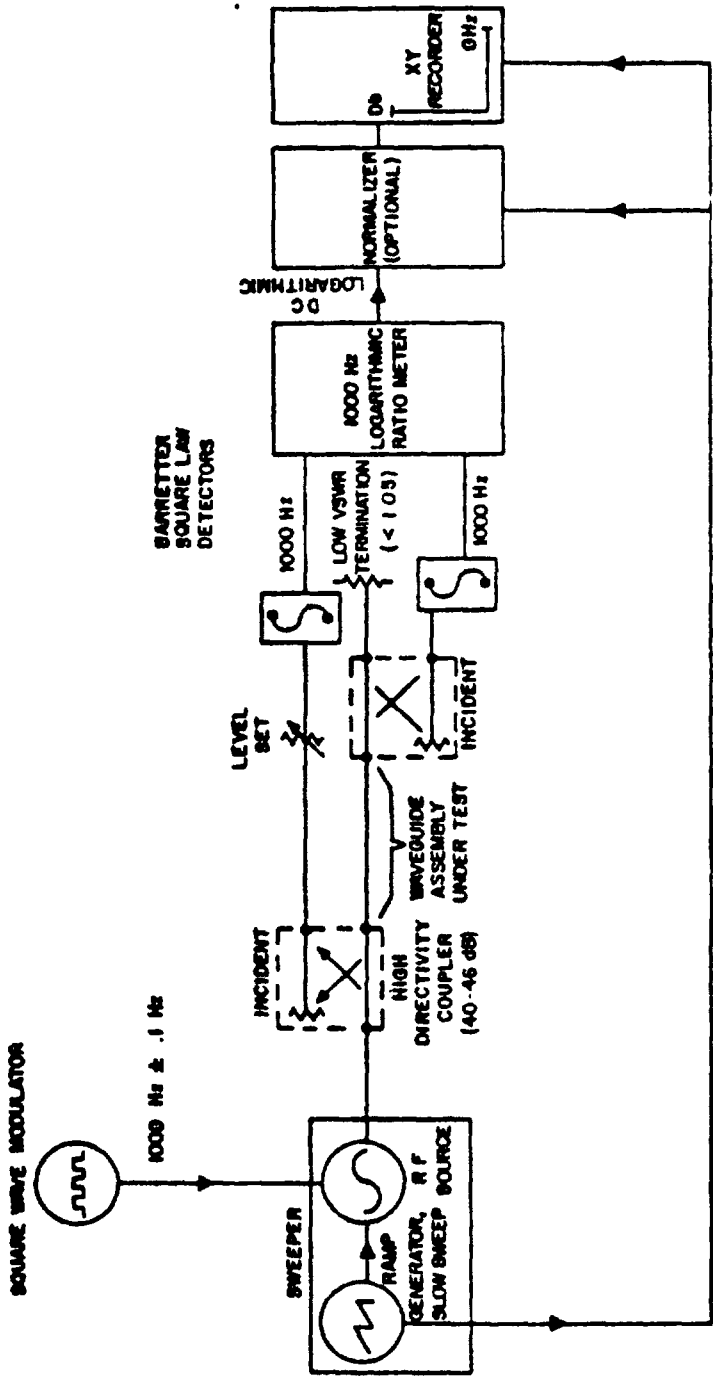


FIGURE 3. Insertion loss test setup.

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4.8.7 Shock (specified pulse) (see 3.11). Assemblies shall be tested in accordance with MIL-STD-202, method 213. The following details shall apply:

- a. Mounting - Rigidly mounted to test platform.
- b. Test condition letter - G.
- c. Measurements after shock - VSWR, insertion loss, and pressurization shall be measured as specified in 4.8.2, 4.8.3, and 4.8.4, respectively.

4.8.8 Power handling capability (when specified, see 3.1) (see 3.12). Assemblies shall be subjected to the radio frequency (RF) power level specified (see 3.1) at the frequency, simulated altitude, and temperature specified (see 3.1). Power shall be maintained for 1 hour after the temperature of the assembly has reached equilibrium (equilibrium has been attained when the assembly temperature does not change more than 5°C within a 15-minute period). During the test the assembly shall be terminated in a matched load (1.1 VSWR maximum). After the test VSWR and insertion loss shall be measured as specified in 4.8.2 and 4.8.3, respectively.

5. PACKAGING

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

5.1.1 Level A.

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

5.1.1.2 Drying. Waveguide assemblies 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 packs. Each waveguide assembly shall be individually unit packed in accordance with the submethods of MIL-P-116 specified herein insuring compliance with the applicable requirements of that specification.

5.1.1.4.1 Small waveguide assemblies. Waveguide assemblies not exceeding 50 cubic inches (819.5 cubic centimeters) in overall net dimensions (length x width x depth) shall be unit packed in accordance with submethod 11e. The container shall conform to PPP-B-566 or PPP-B-676.

5.1.1.4.2 Large waveguide assemblies. Waveguide assemblies exceeding 50 cubic inches in overall net dimensions shall be unit packed in accordance with submethod 11b. The unit container shall conform to PPP-B-636, class weather resistant.

5.1.1.5 Intermediate packs. Intermediate packs are not required.

5.1.2 Level C. The level C preservation for waveguide assemblies shall conform to the MIL-STD-794 requirements for this level.

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

5.2.1 Level A. The packaged waveguide assemblies shall be packed in wood boxes conforming to PPP-B-601, overseas type; PPP-B-621, class 2 or PPP-B-585, class 3. Closure and strapping shall be in accordance with the applicable container specification.

5.2.2 Level B. The packaged waveguide assemblies shall be packed in fiberboard containers conforming to PPP-B-636, class weather resistant, style optional, special requirements. The requirements for box closure, waterproofing and reinforcing shall be in accordance with method V of the PPP-B-636 appendix.

5.2.3 Level C. The level C packing for waveguide assemblies shall conform to the MIL-STD-794 requirements for this level.

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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. Waveguide assemblies, packed as specified in 5.2.1, shall be unitized on pallets in conformance with MIL-STD-147, load type I, with a wood cap (storage aid 5) positioned over each load.

5.2.4.2 Level B. Waveguide assemblies, packed as specified in 5.2.2, shall be unitized as specified in 5.2.4.1, except that fiberboard caps (storage aid 4) shall be used in lieu of wood caps.

5.2.4.3 Level C. Waveguide assemblies, packed as specified in 5.2.3, shall be unitized as specified in MIL-STD-794 except that conformance to MIL-STD-147 is not required.

5.3 Marking. In addition to any special or other identification marking required by the contract (see 6.2), each unit 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 Packaging inspection. The inspection of these packaging requirements shall be in accordance with 4.7.2.

6. NOTES

6.1 Intended use. Rigid waveguide assemblies are intended for use as bends, corners and twists in rigid waveguide transmission lines to facilitate permanent direction or field orientation changes in the transmission line.

6.2 Ordering data. Acquisition documents should specify the following.

- a. Title, number, and date of this specification.
- b. Title, number, and date of applicable specification sheet and the complete part number.
- c. Levels of preservation-packaging and packing required (see 5.1 and 5.2).
- d. If special or other identification marking is required (see 5.3).

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 applicable Qualified Products List, whether or not such products have actually been so listed by that date. The attention of the contractors 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 for the products covered by this specification. The activity responsible for the Qualified Products List is the Naval Electronic Systems Command, ELEX 8111, Department of the Navy, Washington, DC 20360 however, information pertaining to qualification of products may be obtained from the Defense Electronics Supply Center (DESC-E), Dayton, OH 45444.

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6.3.1 Copies of "SD-6 Provisions Governing Qualification" may be obtained upon application to Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

6.4 First article inspection. Information pertaining to first article inspection of products covered by this specification should be obtained from the acquiring activity for the specific contracts involved (see 3.3).

6.5 Occupation Safety and Health Administration (OSHA). OSHA review completed; no further review required.

6.6 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 - ER
Navy - EC
Air Force - 85

Preparing activity

Navy - EC

(Project 5985-0970)

Review activities:

Army - MI
Navy - SH, OS
Air Force - 11, 17, 80, 99
DLA - ES

User activities:

Army - MU
Navy - MC, CG, AS
Air Force - 14, 19

Agent:

DLA - ES

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APPENDIX

GROUP QUALIFICATION

10 SCOPE

10.1 Scope. The purpose of this appendix is to provide manufacturers a grouping that can be used to obtain qualification for a number of items by qualifying one group. The grouping shall be in accordance with table I. This appendix is a mandatory part of the specification. The information contained herein is intended for compliance.

20 APPLICABLE DOCUMENTS

This section is not applicable to this appendix.

TABLE I. Grouping for qualification.

Group number	Qualifying part number(s)	Part number of assemblies qualified
IA	M3970/1-006, -014, and -027	M3970/1-001 thru -005; -007 thru -026, M3970/17-001 thru -027
IB	M3970/1-006, -014, and -023	M3970/1-001 thru -005, -007 thru -022; M3970/17-001 thru -003
IC	M3970/1-005, -011, and -014	M3970/1-001 thru -004, -008 thru -015, -017 thru -021
I1A	M3970/7-006, -014, and -022	M3970/7-001 thru -013; -015 thru -022, -032; M3970/6-001 thru -022; M3970/5-001 thru -022, M3970/18-001 thru -006
I1B	M3970/7-006, -014, and -018	M3970/7-001 thru -013; -015 thru -017; -032; M3970/6-001 thru -017; M3970/5-001 thru -017, M3970/18-001 and -002
I1C	M3970/7-008, -011, and -014	M3970/7-001 thru -005, -009 thru -012; -014; -015; -032; M3970/6-001 thru -005; -008 thru -012; -014; -015, M3970/5-001 thru -005; -008 thru -012, -014; and -015
I1D	M3970/7-001 and -028	M3970/7-010; -023 thru -031; M3970/6-001 and -010; M3970/5-001 and -010
I11A	M3970/13-006, -014, and -023	M3970/13-001 thru -005; -007 thru -013, M3970/13-015 and -016; -018 thru -022; M3970/12-001 thru -022, M3970/11-001 thru -022, M3970/19-002 thru -007
I11B	M3970/13-006, -014, and -019	M3970/13-001 thru -005, -007 thru -016, -018, M3970/12-001 thru -018; M3970/11-001 thru -018; M3970/19-002 and -003

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TABLE I. Grouping for qualification - Continued.

Group number	Qualifying part number(s)	Part number of assemblies qualified
IIIC	M3970/13-005, -011, and -014	M3970/13-001 thru -004; -008 thru -010; -012; -014, -015; M3970/12-001 thru -005; -008 thru -012; -014; -015; M3970/11-001 thru -005; -008 thru -012; -014; -015
IIID	M3970/13-001 and -029	M3970/13-010, -017, -024 thru 032, M3970/12-001, -010; M3970/11-001; -010, M3970/20-001, M3970/19-001
IYA	M3970/10-005, -007, and -014	M3970/10-001 thru -004; -006; -008 thru -013, -014 thru -016; M3970/9-001 thru -016; M3970/8-001 thru -016
IYB	M3970/10-005 and -014	M3970/10-001 thru -004; -009; -010; -012; -014; M3970/9-001 thru -005; -008 thru -010, -012; -014, -015, M3970/8-001 thru -005, -008 thru -010, -012; -014
YA	M3970/16-005, -007, and -014	M3970/16-001 thru -004, -006, -008 thru -013; -014 thru -016; M3970/15-001 thru -016; M3970/14-001 thru -016
YB	M3970/16-005 and -014	M3970/16-001 thru -004; -008 thru -010; -012; -014; M3970/15-001 thru -005, -008 thru -010; -012; -014; M3970/14-001 thru -005; -008 thru -010; -012; -014
VIA	M3970/22-001, -007, and -017	M3970/22-002 thru -006; -008 thru -016 M3970/21 -001 and -002; M3970/23-001 thru -003; M3970/24-001, M3970/25-001
VIB	M3970/22-001 and -007	M3970/22-002 thru -006; -008 thru -011; M3970/21-001 and -002; M3970/23-001 thru -003; M3970/24-001; M3970/25-001
VIIA	M3970/28-001	M3970/26-001 and -002; M3970/27-001; M3970/29-001 and -002; M3970/30-001; M3970/31-001

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