

MIL-STD-1638A

21 August 1980

SUPERSEDING

MIL-STD-1638

27 May 1977

MILITARY STANDARD

WAVEGUIDE ASSEMBLIES, RIGID AND FLEXIBLE, SELECTION OF



FSC 5985

MIL-STD-1638A
21 August 1980

DEPARTMENT OF DEFENSE
Washington, DC 20301

Waveguide Assemblies, Rigid, and Flexible, Selection of.

MIL-STD-1638A

1. This Military Standard is approved for use by all Departments and Agencies of the Department of Defense.

2. 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, ELEX 5043, 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.

MIL-STD-1638A
21 August 1980

CONTENTS

Paragraph		Page
1.	SCOPE - - - - -	1
1.1	General - - - - -	1
1.2	Purpose - - - - -	1
2.	REFERENCED DOCUMENTS- - - - -	1
2.1	Issues of documents - - - - -	1
3.	DEFINITIONS - - - - -	1
4.	GENERAL REQUIREMENTS- - - - -	1
4.1	Selection of waveguide assemblies - - - - -	1
4.2	Criteria for inclusion- - - - -	1
4.3	Electrical and physical tolerances- - - - -	1
4.4	Detailed requirements - - - - -	2
5.	DETAILED REQUIREMENTS (Not applicable)- - - - -	2
6.	NOTES (Not applicable)- - - - -	2

TABLES

Table		Page
I.	Waveguide assemblies, rigid, straight, 90-degree twist- - - - -	3
II.	Waveguide assemblies, rigid, 45-degree E-plane bend - - - - -	4
III.	Waveguide assemblies, rigid, 60-degree E-plane bend - - - - -	5
IV.	Waveguide assemblies, rigid, 90-degree E-plane bend - - - - -	6
V.	Waveguide assemblies, rigid, 45-degree E-plane mitered corner -	7
VI.	Waveguide assemblies, rigid, 60-degree E-plane mitered corner -	8
VII.	Waveguide assemblies, rigid, 90-degree E-plane mitered corner -	8
VIII.	Waveguide assemblies, rigid, 45-degree H-plane bend - - - - -	9
IX.	Waveguide assemblies, rigid, 60-degree H-plane bend - - - - -	10
X.	Waveguide assemblies, rigid, 90-degree H-plane bend - - - - -	11
XI.	Waveguide assemblies, rigid, 45-degree H-plane mitered corner -	12
XII.	Waveguide assemblies, rigid, 60-degree H-plane mitered corner -	12
XIII.	Waveguide assemblies, rigid, 90-degree H-plane mitered corner -	13
XIV.	Waveguide assemblies, rigid, straight 45-degree twist - - - - -	13
XV.	Waveguide assemblies, rigid, 30-degree E-plane bend - - - - -	14
XVI.	Waveguide assemblies, rigid, 30-degree H-plane bend - - - - -	14
XVII.	Waveguide assembly, rigid, 40-degree H-plane bend - - - - -	15
XVIII.	Waveguide assemblies, rigid, cast - - - - -	15
XIX.	Waveguide assemblies, flexible, twistable, class 1- - - - -	18
XX.	Waveguide assemblies, flexible, nontwistable, class 2 - - - - -	20
XXI.	Waveguide assemblies, extra-flexible, twistable, class 3- - - - -	22
XXII.	Waveguide assemblies, flexible, twistable, class 5- - - - -	24
XXIII.	Waveguide assemblies, flexible, nontwistable, class 7 - - - - -	24
XXIV.	Millimeter waveguide assemblies, flexible, nontwistable, class 8 - - - - -	25
XXV.	Cross reference of AN nomenclature to part number - - - - -	26

MIL-STD-1638A
21 August 1980

1. SCOPE

1.1 General. This standard defines waveguide assemblies considered by the Department of Defense as standard for use in military equipment and applications.

1.2 Purpose. The purpose of this standard is to:

- a. Provide the equipment designer with a list of waveguide assemblies considered standard for use in military applications.
- b. Restrict and minimize the variety of waveguide assemblies for use in military applications in order to provide effective logistic support of equipment.

2. REFERENCED DOCUMENTS

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

SPECIFICATIONS

MILITARY

- MIL-W-287 - Waveguide Assemblies, Flexible, Twistable and Nontwistable, General Specification For.
- MIL-W-3970 - Waveguide Assemblies, Rigid, General Specification For.

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

3. DEFINITIONS

3.1 The terms used in this standard are those commonly encountered in microwave engineering practice.

4. GENERAL REQUIREMENTS

4.1 Selection of waveguide assemblies. Waveguide assemblies to be used in military applications shall be selected from those listed in the tables herein.

4.2 Criteria for inclusion. The criteria for the selection of waveguide assemblies for inclusion in this standard are:

- a. The waveguide assembly shall be considered by representatives of the Military Departments as the best available type for the current application.
- b. Availability of the waveguide assembly shall be reasonably certain.
- c. The waveguide assembly shall have an approved military specification.

4.3 Electrical and physical tolerances. Waveguide assemblies used in military applications shall be representative of manufactured lots possessing acceptable materials, physical and electrical characteristics, and shall in no manner degrade the operational characteristics of the equipment used in military applications.

MIL-STD-1638A
21 August 1980

4.4 Detailed requirements. The detailed requirements for waveguide assemblies listed in this standard are covered by MIL-W-3970 or MIL-W-287 specification sheets, as applicable.

5. DETAILED REQUIREMENTS

Not applicable.

6. NOTES

Not applicable.

MIL-STD-1638A
21 August 1980

TABLE I. Waveguide assemblies, rigid, straight, 90-degree twist.

Dash No. M3970/1-	Waveguide M85/ M3922/	Flange		Frequency range TE ₁₀ mode	Insertion loss max	VSWR max	Material 1/	Pressuriza- tion lb _f /in. ² gage
		1	2					
		M3922/						
				GHz	dB			
001	1-043	56-001	61-002	2.6 - 3.95	-	1.02	Cu	15
002	1-055	57-002	62-002	3.95 - 5.85	-	1.05	Cu	30
003	1-067	55-001	60-001	5.85 - 8.2	-	1.05	Cu	↓
004	1-073	53-002	59-007	7.05 - 10	-	1.05	Cu	
005	1-079	53-001	59-006	8.2 - 12.4	-	1.05	Cu	
006	1-102	54-001	59-003	18 - 26.5	.11	1.06	Cu	
007	1-106	54-001	59-003	18 - 26.5	.11	1.06	Cu	
008	1-077	53-003	59-008	8.2 - 12.4	-	1.05	Al	
009	1-071	53-004	59-009	7.05 - 10	-	1.05	Al	
010	1-041	56-002	61-001	2.6 - 3.95	-	1.02	Al	
011	1-089	53-005	59-001	12.4 - 18	.07	1.05	Cu	
012	1-053	57-001	62-001	3.95 - 5.85	-	1.05	Al	
013	3-006	54-003	59-005	26.5 - 40	.15	1.10	Cu	
014	1-065	55-002	60-002	5.85 - 8.2	-	1.05	Al	
015	1-093	53-005	59-001	12.4 - 18	.07	1.05	Cu	
016	1-103	54-002	59-004	18 - 26.5	.11	1.06	Al	
017	1-157	70-002	70-002	7.0 - 11	-	1.06	Al	
018	1-073	59-007	59-007	7.05 - 10	-	1.05	Cu	
019	1-079	59-006	59-006	8.2 - 12.4	-	1.05	Cu	
020	1-090	53-006	59-002	12.4 - 18	.07	1.06	Al	
021	1-090	53-006 2/	53-006 2/	12.4 - 18	.07	1.06	Cu	
022	3-006	54-003	54-003	26.5 - 40	.15	1.1	Cu	
023	3-008							30
	3-006	67-005	67-005	26.5 - 40	.15	1.1	Cu	---
	3-008							---
024	3-010	67-006	67-006	33 - 50	.17	1.1	Cu	---
	3-012							---
025	3-014	67-007	67-007	40 - 60	.19	1.1	Cu	---
	3-016							---
026	3-017	67-008	67-008	50 - 75	.21	1.1	Cu	---
	3-019							---
027	3-020	67-009	67-009	60 - 90	.23	1.1	Cu	---
	3-022							---

1/ Cu = Copper alloy, Al = Aluminum alloy.

2/ Except flange thickness is .25 in lieu of .125.

MIL-STD-1638A
21 August 1980

TABLE II. Waveguide assemblies, rigid, 45-degree E-plane bend.

Dash No. M3970/5-	Waveguide M85/ M3922/	Flange		Frequency range TE ₁₀ mode GHz	Insertion loss max dB	VSWR max	Material <u>1/</u>	Pressuriza- tion lb _f /in. ² gage	
		1	2						
001	1-043	56-001	61-002	2.6 - 3.95	-	1.04	Cu	15	
002	1-055	57-002	62-002	3.95 - 5.85	-	1.05	Cu	30	
003	1-067	55-001	60-001	5.85 - 8.20	-	1.05	Cu	↓ 30 ↓ 30 ↓ 30 ---	
004	1-073	53-002	59-007	7.05 - 10	-	1.05	Cu		
005	1-079	53-001	59-006	8.2 - 12.4	-	1.04	Cu		
006	1-102	54-001	59-003	18 - 26.5	.11	1.05	Cu		
007	1-106	54-001	59-003	18 - 26.5	.11	1.05	Cu		
008	1-077	53-003	59-008	8.2 - 12.4	-	1.04	Al		
009	1-071	53-004	59-009	7.05 - 10	-	1.05	Al		
010	1-041	56-002	61-001	2.6 - 3.95	-	1.04	Al		
011	1-089	53-005	59-001	12.4 - 18	.07	1.05	Cu		
012	1-053	57-001	62-001	3.95 - 5.85	-	1.05	Al		
013	3-006	54-003	59-005	26.5 - 40	.15	1.08	Cu		
014	1-065	55-002	60-002	5.85 - 8.20	-	1.05	Al		
015	1-093	53-005	59-001	12.4 - 18	.07	1.05	Cu		
016	1-103	54-002	59-004	18 - 26.5	.11	1.05	Al		
017	3-006	54-003	59-005	26.5 - 40	.15	1.1	Cu		
018	3-008								
	3-006	67-005	67-005	26.5 - 40	.15	1.1	Cu		---
	3-008								
019	3-010	67-006	67-006	33 - 50	.17	1.1	Cu	---	
	3-012								
020	3-014	67-007	67-007	40 - 60	.19	1.1	Cu	---	
	3-016								
021	3-017	67-008	67-008	50 - 75	.21	1.1	Cu	---	
	3-019								
022	3-020	67-009	67-009	60 - 90	.23	1.1	Cu	---	
	3-022								

1/ Cu = Copper alloy, Al = Aluminum alloy.

MIL-STD-1638A
21 August 1980

TABLE III. Waveguide assemblies, rigid, 60-degree E-plane bend.

Dash No. M3970/6-	Waveguide M85/	Flange		Frequency range TE ₁₀ mode	Insertion loss max	VSWR max	Material 1/	Pressuriza- tion lb _f /in. ² gage	
		1	2						
		M3922/							
				GHz	dB				
001	1-043	56-001	61-002	2.6 - 3.95	-	1.02	Cu	15	
002	1-055	57-002	62-002	3.95 - 5.85	-	1.05	Cu	30	
003	1-067	55-001	60-001	5.85 - 8.2	-	1.05	Al	↓ 30 15 30 ↓ 30	
004	1-073	53-002	59-007	7.05 - 10	-	1.04	Cu		
005	1-079	53-001	59-006	8.2 - 12.4	-	1.05	Cu		
006	1-102	54-001	59-003	18 - 26.5	.11	1.05	Cu		
007	1-106	54-001	59-003	18 - 26.5	.11	1.05	Cu		
008	1-077	53-003	59-008	8.2 - 12.4	-	1.05	Cu		
009	1-071	53-004	59-009	7.05 - 10	-	1.04	Al		
010	1-041	56-002	61-001	2.6 - 3.95	-	1.02	Al		
011	1-089	53-005	59-001	12.4 - 18	.07	1.05	Cu		
012	1-053	57-001	62-001	3.95 - 5.85	-	1.05	Al		
013	3-006	54-003	59-005	26.5 - 40	.15	1.08	Cu		
014	1-065	55-002	60-002	5.85 - 8.20	-	1.05	Al		
015	1-093	53-005	59-001	12.4 - 18	.07	1.05	Cu		
016	1-103	54-002	59-004	18 - 26.5	.11	1.05	Al		
017	3-006	54-003	59-005	26.5 - 40	.15	1.1	Cu		
	3-008								
018	3-006	67-005	67-005	26.5 - 40	.15	1.1	Cu		---
	3-008								
019	3-010	67-006	67-006	33 - 50	.17	1.1	Cu	---	
	3-012								
020	3-014	67-007	67-007	40 - 60	.19	1.1	Cu	---	
	3-016								
021	3-017	67-008	67-008	50 - 75	.21	1.1	Cu	---	
	3-019								
022	3-020	67-009	67-009	60 - 90	.23	1.1	Cu	---	
	3-022								

1/ Cu = Copper alloy, Al = Aluminum alloy.

MIL-STD-1638A
21 August 1980

TABLE IV. Waveguide assemblies, rigid, 90-degree E-plane bend.

Dash No. M3970/7-	Waveguide M85/	Flange		Frequency range TE ₁₀ mode	Insertion loss max	VSWR max	Material 1/	Pressuriza- tion lb _f /in. ² gage
		1	2					
		M3922/		GHz	dB			
001	1-043	56-001	61-002	2.6 - 3.95	-	1.03	Cu	15
002	1-055	57-002	62-002	3.95 - 5.85	-	1.05	Cu	30
003	1-067	55-001	60-001	5.85 - 8.2	-	1.05	Cu	
004	1-073	53-002	59-007	7.05 - 10	-	1.05	Cu	
005	1-079	53-001	59-006	8.2 - 12.4	-	1.05	Cu	
006	1-102	54-001	59-003	18 - 26.5	.11	1.06	Cu	
007	1-106	54-001	59-003	18 - 26.5	.11	1.08	Cu	
008	1-077	53-003	59-008	8.2 - 12.4	-	1.05	Al	↓
009	1-071	53-004	59-009	7.05 - 10	-	1.05	Al	30
010	1-041	56-002	61-001	2.6 - 3.95	-	1.03	Al	15
011	1-089	53-005	59-001	12.4 - 18	.07	1.05	Cu	30
012	1-053	57-001	62-001	3.95 - 5.85	-	1.05	Al	
013	3-006	54-003	59-005	26.5 - 40	.15	1.08	Cu	
014	1-065	55-002	60-002	5.85 - 8.2	-	1.05	Al	
015	1-093	53-005	59-001	12.4 - 18	.07	1.05	Cu	
016	1-103	54-002	59-004	18 - 26.5	.11	1.06	Al	↓
017	3-006	54-003	54-003	26.5 - 40	.15	1.1	Cu	30
	3-008							
018	3-006	67-005	67-005	26.5 - 40	.15	1.1	Cu	---
	3-008							
019	3-010	67-006	67-006	33 - 50	.17	1.1	Cu	---
	3-012							
020	3-014	67-007	67-007	40 - 60	.19	1.1	Cu	---
	3-016							
021	3-017	67-008	67-008	50 - 75	.21	1.1	Cu	---
	3-019							
022	3-020	67-009	67-009	60 - 90	.23	1.1	Cu	---
	3-022							
023	1-001	76-07	76-07	.32 - .49	.10	1.05	Al	.25
	1-002							
	1-161							
024	1-003	76-06	76-06	.35 - .53	.10	1.05	Al	
	1-004							
	1-162							
025	1-005	76-05	76-05	.410 - .625	.10	1.05	Al	
	1-006							
	1-163							
026	1-007	76-04	76-04	.490 - .750	.10	1.05	Al	.25
	1-008							
	1-164							
027	1-009	76-03	76-03	.64 - .96	.10	1.05	Al	.50
	1-010							
	1-165							
028	1-011	76-02	76-02	.75 - 1.12	.10	1.05	Al	.50
	1-012							
	1-166							
029	1-013	76-01	76-01	.96 - 1.45	.10	1.05	Al	1.0
	1-014							
	1-167							

1/ Cu = Copper alloy, Al = Aluminum alloy.

MIL-STD-1638A
21 August 1980

TABLE IV. Waveguide assemblies, rigid, 90-degree E-plane bend - Continued.

Dash No. M3970/7-	Waveguide M85/	Flange		Frequency range TE ₁₀ mode	Insertion loss max	VSWR max	Material 1/	Pressuriza- tion lb _f /in. ² gage
		1	2					
		M3922/						
030	1-018 1-019 1-168	52-002	52-002	1.12 - 1.70	.10	1.05	Al	1.5
031	1-029 1-030 1-170	52-006	52-006	1.70 - 2.60	.10	1.05	Al	3.0

1/ Cu = Copper alloy, Al = Aluminum alloy.

TABLE V. Waveguide assemblies, rigid, 45-degree E-plane mitered corner.

Dash No. M3970/8-	Waveguide M85/	Flange		Frequency range TE ₁₀ mode	Insertion loss max	VSWR max	Material 1/	Pressuriza- tion lb _f /in. ² gage
		1	2					
		M3922/						
001	1-043	56-001	61-002	2.60 - 3.95	.05	1.08	Cu	15
002	1-055	57-002	62-002	3.95 - 5.85	.05	1.08	Cu	30
003	1-067	55-001	60-001	5.85 - 8.20	.05	1.07	Cu	↓
004	1-073	53-002	59-007	7.05 - 10.0	.06	1.07	Cu	
005	1-079	53-001	59-006	8.20 - 12.4	.06	1.08	Cu	
006	1-102	54-001	59-003	18.0 - 26.5	.11	1.06	Cu	
007	1-106	54-001	59-003	18.0 - 26.5	.11	1.06	Cu	
008	1-077	53-003	59-008	8.20 - 12.4	.06	1.08	Al	
009	1-071	53-004	59-009	7.05 - 10.0	.06	1.08	Al	30
010	1-041	56-002	61-001	2.60 - 3.95	.05	1.08	Al	15
011	1-089	53-005	59-001	12.4 - 18.0	.07	1.10	Cu	30
012	1-053	57-001	62-001	3.95 - 5.85	.05	1.08	Al	↓
013	3-006	54-003	59-005	26.5 - 40.0	.15	1.12	Cu	
014	1-065	55-002	60-002	5.85 - 8.20	.05	1.07	Al	
015	1-093	53-005	59-001	12.4 - 18.0	.07	1.10	Cu	
016	1-103	54-002	59-004	18.0 - 26.5	.11	1.06	Al	

1/ Cu = Copper alloy, Al = Aluminum alloy.

MIL-STD-1638A
21 August 1980

TABLE VI. Waveguide assemblies, rigid, 60-degree E-plane mitered corner.

Dash No. M3970/9-	Waveguide M85/	Flange		Frequency range TE ₁₀ mode	Insertion loss max	VSWR max	Material 1/	Pressuriza- tion lb _f /in. ² gage
		1	2					
		M3922/						
				GHz	dB			
001	1-043	56-001	61-002	2.60 - 3.95	.05	1.07	Cu	15
002	1-055	57-002	62-002	3.95 - 5.85	.05	1.09	Cu	30
003	1-067	55-001	60-001	5.85 - 8.20	.05	1.10	Cu	↓
004	1-073	53-002	59-007	7.05 - 10.0	.06	1.08	Cu	
005	1-079	53-001	59-006	8.20 - 12.4	.06	1.09	Cu	
006	1-102	54-001	59-003	18.0 - 26.5	.11	1.10	Cu	
007	1-106	54-001	59-003	18.0 - 26.5	.11	1.10	Cu	
008	1-077	53-003	59-008	8.20 - 12.4	.06	1.09	Al	
009	1-071	53-004	59-009	7.05 - 10.0	.06	1.08	Al	
010	1-041	56-002	61-001	2.60 - 3.95	.05	1.07	Al	
011	1-089	53-005	59-001	12.4 - 18.0	.07	1.09	Cu	
012	1-053	57-001	62-001	3.95 - 5.85	.05	1.09	Al	
013	3-006	54-003	59-005	26.5 - 40.0	.15	1.15	Cu	
014	1-065	55-002	60-002	5.85 - 8.20	.05	1.10	Al	
015	1-093	53-005	59-001	12.4 - 18.0	.07	1.09	Cu	
016	1-103	54-002	59-004	18.0 - 26.5	.11	1.10	Al	

1/ Cu = Copper alloy, Al = Aluminum alloy.

TABLE VII. Waveguide assemblies, rigid, 90-degree E-plane mitered corner.

Dash No. M3970/10-	Waveguide M85/	Flange		Frequency range TE ₁₀ mode	Insertion loss max	VSWR max	Material 1/	Pressuriza- tion lb _f /in. ² gage
		1	2					
		M3922/						
				GHz	dB			
001	1-043	56-001	61-002	2.60 - 3.95	.05	1.07	Cu	15
002	1-055	57-002	62-002	3.95 - 5.85	.05	1.09	Cu	30
003	1-067	55-001	60-001	5.85 - 8.20	.05	1.10	Cu	↓
004	1-073	53-002	59-007	7.05 - 10.0	.06	1.05	Cu	
005	1-079	53-001	59-006	8.20 - 12.40	.06	1.10	Cu	
006	1-102	54-001	59-003	18.0 - 26.50	.11	1.07	Cu	
007	1-106	54-001	59-003	18.0 - 26.50	.11	1.16	Cu	
008	1-077	53-003	59-008	8.20 - 12.40	.06	1.10	Al	
009	1-071	53-004	59-009	7.05 - 10.0	.06	1.05	Al	
010	1-041	56-002	61-001	2.60 - 3.95	.05	1.07	Al	
011	1-089	53-005	59-001	12.4 - 18.0	.07	1.10	Cu	
012	1-053	57-001	62-001	3.95 - 5.85	.05	1.09	Al	
013	3-006	54-003	59-005	26.5 - 40.0	.15	1.16	Cu	
014	1-065	55-002	60-002	5.85 - 8.20	.05	1.10	Al	
015	1-093	53-005	59-001	12.4 - 18.0	.07	1.10	Cu	
016	1-103	54-002	59-004	18.0 - 26.5	.11	1.07	Al	

1/ Cu = Copper alloy, Al = Aluminum alloy.

MIL-STD-1638A
21 August 1980

TABLE VIII. Waveguide assemblies, rigid, 45-degree H-plane bend.

Dash No. M3970/11-	Waveguide M85/	Flange		Frequency range TE ₁₀ mode GHz	Insertion loss max dB	VSWR max	Material 1/	Pressurization lb _f /in. ² gage	
		1	2						
		M3922/							
001	1-043	56-001	61-002	2.6 - 3.95	-	1.04	Cu	15	
002	1-055	57-002	62-002	3.95 - 5.85	-	1.05	Cu	30	
003	1-067	55-001	60-001	5.85 - 8.2	-	1.04	Cu	↓ 30 15 30 ↓ 30	
004	1-073	53-002	59-007	7.05 - 10	-	1.05	Cu		
005	1-079	53-001	59-006	8.2 - 12.4	-	1.04	Cu		
006	1-102	54-001	59-003	18 - 26.5	-	1.06	Cu		
007	1-106	54-001	59-003	18 - 26.5	.11	1.06	Cu		
008	1-077	53-003	59-008	8.2 - 12.4	-	1.04	Al		
009	1-071	53-004	59-009	7.05 - 10	-	1.05	Al		
010	1-041	56-002	61-001	2.6 - 3.95	-	1.04	Al		
011	1-089	53-005	59-001	12.4 - 18	.07	1.05	Cu		
012	1-053	57-001	62-001	3.95 - 5.85	-	1.04	Al		
013	3-006	54-003	59-005	26.5 - 40	.15	1.08	Cu		
014	1-065	55-002	60-002	5.85 - 8.2	-	1.05	Al		
015	1-093	53-005	59-001	12.4 - 18	.07	1.05	Cu		
016	1-103	54-002	59-004	18 - 26.5	.15	1.06	Al		
017	3-006	54-003	54-003	26.5 - 40	.15	1.1	Cu		
018	3-008	67-005	67-005	26.5 - 40	.15	1.1	Cu		---
019	3-010	67-006	67-006	33 - 50	.17	1.1	Cu		---
020	3-012								
020	3-014	67-007	67-007	40 - 60	.19	1.1	Cu	---	
021	3-016								
021	3-017	67-008	67-008	50 - 75	.21	1.1	Cu	---	
022	3-019								
022	3-020	67-009	67-009	60 - 90	.23	1.1	Cu	---	
	3-022								

1/ Cu = Copper alloy, Al = Aluminum alloy.

MIL-STD-1638A
21 August 1980

TABLE IX. Waveguide assemblies, rigid, 60-degree H-plane bend.

Dash No. M3970/12-	Waveguide M85/ M3922/	Flange		Frequency range TE ₁₀ mode GHz	Insertion loss max dB	VSWR max	Material 1/	Pressuriza- tion lb _f /in. ² gage
		1	2					
		M3922/						
001	1-043	56-001	61-002	2.6 - 3.95	-	1.04	Cu	15
002	1-055	57-002	62-002	3.95 - 5.85	-	1.04	Cu	30
003	1-067	55-001	60-001	5.85 - 8.2	-	1.04	Cu	↓
004	1-073	53-002	59-007	7.05 - 10	-	1.05	Cu	↓
005	1-079	53-001	59-006	8.2 - 12.4	-	1.05	Cu	↓
006	1-102	54-001	59-003	18 - 26.5	.11	1.04	Cu	↓
007	1-106	54-001	59-003	18 - 26.5	.11	1.04	Cu	↓
008	1-077	53-003	59-008	8.2 - 12.4	-	1.05	Al	↓
009	1-071	53-004	59-009	7.05 - 10	-	1.05	Al	30
010	1-041	56-002	61-001	2.6 - 3.95	-	1.04	Al	15
011	1-089	53-005	59-001	12.4 - 18	.07	1.04	Cu	30
012	1-053	57-001	62-001	3.95 - 5.85	-	1.04	Al	↓
013	3-006	54-003	59-005	26.5 - 40	.15	1.10	Cu	↓
014	1-065	55-002	60-002	5.85 - 8.2	-	1.04	Al	↓
015	1-093	53-005	59-001	12.4 - 18	.07	1.05	Cu	↓
016	1-103	54-002	59-004	18 - 26.5	.11	1.04	Al	↓
017	3-006	54-003	54-003	26.5 - 40	.15	1.1	Cu	30
	3-008							
018	3-006	67-005	67-005	26.5 - 40	.15	1.1	Cu	---
	3-008							
019	3-010	67-006	67-006	33 - 50	.17	1.1	Cu	---
	3-012							
020	3-014	67-007	67-007	40 - 60	.19	1.1	Cu	---
	3-016							
021	3-017	67-008	67-008	50 - 75	.21	1.1	Cu	---
	3-019							
022	3-020	67-009	67-009	60 - 90	.23	1.1	Cu	---
	3-022							

1/ Cu = Copper alloy, Al = Aluminum alloy.

MIL-STD-1638A
21 August 1980

TABLE X. Waveguide assemblies, rigid, 90-degree H-plane bend.

Dash No. M3970/13-	Waveguide M85/	Flange		Frequency range TE ₁₀ mode GHz	Insertion loss max dB	VSWR max	Material 1/	Pressuriza- tion lb _f /in. ² gage
		1	2					
		M3922/						
001	1-043	56-001	61-002	2.6 - 3.95	-	1.05	Cu	15
002	1-055	57-002	62-002	3.95 - 5.85	-	1.05	Cu	30
003	1-067	55-001	60-001	5.85 - 8.20	-	1.03	Cu	
004	1-073	53-002	59-007	7.05 - 10.0	-	1.07	Cu	
005	1-079	53-001	59-006	8.20 - 12.4	-	1.05	Cu	
006	1-102	54-001	59-003	18.0 - 26.5	.11	1.05	Cu	
007	1-106	54-001	59-003	18.0 - 26.5	.11	1.05	Cu	
008	1-077	53-003	59-008	8.2 - 12.4	-	1.05	Al	↓
009	1-071	53-004	59-009	7.05 - 10.0	-	1.07	Al	30
010	1-041	56-002	61-001	2.60 - 3.95	-	1.05	Al	15
011	1-089	53-005	59-001	12.4 - 18.0	.07	1.04	Cu	30
012	1-053	57-001	62-001	3.95 - 5.85	-	1.05	Al	
013	3-006	54-003	59-005	26.5 - 40.0	.15	1.05	Cu	
014	1-065	55-002	60-002	5.85 - 8.20	-	1.03	Al	
015	1-093	53-005	59-001	12.4 - 18.0	.07	1.04	Cu	
016	1-103	54-002	59-004	18.0 - 26.5	.11	1.05	Cu	↓
017	1-018	52-002	52-002	1.12 - 1.70	-	1.05	Al	30
018	3-006	54-003	54-003	26.5 - 40	.15	1.1	Cu	---
019	3-006	67-005	67-005	26.5 - 40	.15	1.1	Cu	---
020	3-010	67-006	67-006	33 - 50	.17	1.1	Cu	---
	3-012							
021	3-014	67-007	67-007	40 - 60	.19	1.1	Cu	---
	3-016							
022	3-017	67-008	67-008	50 - 75	.21	1.1	Cu	---
	3-019							
023	3-020	67-009	67-009	60 - 90	.23	1.1	Cu	---
	3-022							
024	1-001	76-07	76-07	.32 - .49	.10	1.05	Al	.25
025	1-003	76-06	76-06	.35 - .53	.10	1.05	Al	
026	1-005	76-05	76-05	.410 - .625	.10	1.05	Al	
027	1-007	76-04	76-04	.490 - .750	.10	1.05	Al	.25
028	1-009	76-03	76-03	.64 - .96	.10	1.05	Al	.50
029	1-011	76-02	76-02	.75 - 1.12	.10	1.05	Al	.50
030	1-013	76-01	76-01	.96 - 1.45	.10	1.05	Al	1.0
031	1-018	52-002	52-002	1.12 - 1.70	.10	1.05	Al	1.5
032	1-029	52-006	52-006	1.70 - 2.60	.10	1.05	Al	3.0

1/ Cu = Copper alloy, Al = Aluminum alloy.

MIL-STD-1638A
21 August 1980

TABLE XI. Waveguide assemblies, rigid, 45-degree H-plane mitered corner.

Dash No. M3970/14-	Waveguide M85/ M3922/	Flange		Frequency range TE ₁₀ mode GHz	Insertion loss max dB	VSWR max	Material 1/	Pressuriza- tion lb _f /in. ² gage
		1	2					
		M3922/						
001	1-043	56-001	61-002	2.60 - 3.95	.05	1.03	Cu	15
002	1-055	57-002	62-002	3.95 - 5.85	.05	1.05	Cu	30
003	1-067	55-001	60-001	5.85 - 8.20	.05	1.06	Cu	↓
004	1-073	53-002	59-007	7.05 - 10.0	.06	1.02	Cu	
005	1-079	53-001	59-006	8.20 - 12.4	.06	1.08	Cu	↓
006	1-102	54-001	59-003	18.0 - 26.5	.11	1.04	Cu	
007	1-106	54-001	59-003	18.0 - 26.5	.11	1.04	Cu	↓
008	1-077	53-003	59-008	8.20 - 12.4	.06	1.08	Al	
009	1-071	53-004	59-009	7.05 - 10.0	.06	1.02	Al	30
010	1-041	56-002	61-001	2.60 - 3.95	.05	1.03	Al	15
011	1-089	53-005	59-001	12.4 - 18.0	.07	1.08	Cu	30
012	1-053	57-001	62-001	3.95 - 5.85	.05	1.05	Al	↓
013	3-006	54-003	59-005	26.5 - 40.0	.15	1.08	Cu	
014	1-065	55-002	60-002	5.85 - 8.20	.05	1.06	Al	↓
015	1-093	53-005	59-001	12.4 - 18.0	.07	1.08	Cu	
016	1-103	54-002	59-004	18.0 - 26.5	.11	1.04	Al	30

1/ Cu = Copper alloy, Al = Aluminum alloy.

TABLE XII. Waveguide assemblies, rigid, 60-degree H-plane mitered corner.

Dash No. M3970/15-	Waveguide M85/ M3922/	Flange		Frequency range TE ₁₀ mode GHz	Insertion loss max dB	VSWR max	Material 1/	Pressuriza- tion lb _f /in. ² gage
		1	2					
		M3922/						
001	1-043	56-001	61-002	2.60 - 3.95	.05	1.10	Cu	15
002	1-055	57-002	62-002	3.95 - 5.85	.05	1.07	Cu	30
003	1-067	55-001	60-001	5.85 - 8.20	.05	1.08	Cu	↓
004	1-073	53-002	59-007	7.05 - 10.0	.06	1.06	Cu	
005	1-079	53-001	59-006	8.20 - 12.4	.06	1.07	Cu	↓
006	1-102	54-001	59-003	18.0 - 26.5	.11	1.09	Cu	
007	1-106	54-001	59-003	18.0 - 26.5	.11	1.09	Cu	↓
008	1-077	53-003	59-008	8.20 - 12.4	.06	1.07	Al	
009	1-071	53-004	59-009	7.05 - 10.0	.06	1.06	Al	30
010	1-041	56-002	61-001	2.60 - 3.95	.05	1.10	Al	15
011	1-089	53-005	59-001	12.4 - 18.0	.07	1.08	Cu	30
012	1-053	57-001	62-001	3.95 - 5.85	.05	1.07	Al	↓
013	3-006	54-003	59-005	26.5 - 40.0	.15	1.14	Cu	
014	1-065	55-002	60-002	5.85 - 8.20	.05	1.08	Al	↓
015	1-093	53-005	59-001	12.4 - 18.0	.07	1.08	Cu	
016	1-103	54-002	59-004	18.0 - 26.5	.11	1.09	Al	30

1/ Cu = Copper alloy, Al = Aluminum alloy.

MIL-STD-1638A
21 August 1980

TABLE XIII. Waveguide assemblies, rigid, 90-degree H-plane mitered corner.

Dash No. M3970/16-	Waveguide M85/ M3922/	Flange		Frequency range TE ₁₀ mode GHz	Insertion loss max dB	VSWR max	Material 1/	Pressuriza- tion lb _f /in. ² gage
		1	2					
		M3922/						
001	1-043	56-001	61-002	2.60 - 3.95	.05	1.09	Cu	15
002	1-055	57-002	62-002	3.95 - 5.85	.05	1.08	Cu	30
003	1-067	55-001	60-001	5.85 - 8.20	.05	1.08	Cu	↓ 30 ↓ 30 ↓ 30 ↓ 30 ↓ 30 ↓ 30
004	1-073	53-002	59-007	7.05 - 10.0	.06	1.08	Cu	
005	1-079	53-001	59-006	8.20 - 12.40	.06	1.10	Cu	
006	1-102	54-001	59-003	18.0 - 26.50	.11	1.06	Cu	
007	1-106	54-001	59-003	18.0 - 26.50	.11	1.06	Cu	
008	1-077	53-003	59-008	8.20 - 12.40	.06	1.10	Al	
009	1-071	53-004	59-009	7.05 - 10.0	.06	1.08	Al	
010	1-041	56-002	61-001	2.60 - 3.95	.05	1.09	Al	
011	1-089	53-005	59-001	12.4 - 18.0	.07	1.10	Cu	
012	1-053	57-001	62-001	3.95 - 5.85	.05	1.08	Al	
013	3-006	54-003	59-005	26.5 - 40.0	.15	1.12	Cu	
014	1-065	55-002	60-002	5.85 - 8.20	.05	1.08	Al	
015	1-093	53-005	59-001	12.4 - 18.0	.07	1.10	Cu	
016	1-103	54-002	59-004	18.0 - 26.5	.11	1.06	Al	

1/ Cu = Copper alloy, Al = Aluminum alloy.

TABLE XIV. Waveguide assemblies, rigid, straight 45-degree twist.

Dash No. M3970/17	Waveguide M85/ M3922/	Flange		Frequency range TE ₁₀ mode GHz	Insertion loss max dB	VSWR max	Material 1/	Pressuriza- tion lb _f /in. ² gage
		1	2					
		M3922/						
001	3-006 3-008	54-003	54-003	26.5 - 40	.15	1.1	Cu	30
002	3-006 3-008	67-005	67-005	26.5 - 40	.15	1.1	Cu	---
003	3-010 3-012	67-006	67-006	33 - 50	.17	1.1	Cu	---
004	3-014 3-016	67-007	67-007	40 - 60	.19	1.1	Cu	---
005	3-017 3-019	67-008	67-008	50 - 75	.21	1.1	Cu	---
006	3-020 3-022	67-009	67-009	60 - 90	.23	1.1	Cu	---

1/ Cu = Copper alloy.

MIL-STD-1638A
21 August 1980

TABLE XV. Waveguide assemblies, rigid, 30-degree E-plane bend.

Dash No. M3970/18-	Waveguide M85/	Flange		Frequency range TE ₁₀ mode	Insertion loss max	VSWR max	Material 1/	Pressuriza- tion lb _f /in. ² gage
		1	2					
		M3922/						
				GHz	dB			
001	3-006	54-003	54-003	26.5 - 40	.15	1.1	Cu	30
	3-008							
002	3-006	67-005	67-005	26.5 - 40	.15	1.1	Cu	---
	3-008							
003	3-010	67-006	67-006	33 - 50	.17	1.1	Cu	---
	3-012							
004	3-014	67-007	67-007	40 - 60	.19	1.1	Cu	---
	3-016							
005	3-017	67-008	67-008	50 - 75	.21	1.1	Cu	---
	3-019							
006	3-020	67-009	67-009	60 - 90	.23	1.1	Cu	---
	3-022							

1/ Cu = Copper alloy.

TABLE XVI. Waveguide assemblies, rigid, 30-degree H-plane bend.

Dash No. M3970/19-	Waveguide M85/	Flange		Frequency range TE ₁₀ mode	Insertion loss max	VSWR max	Material 1/	Pressuriza- tion lb _f /in. ² gage
		1	2					
		M3922/						
		Configuration B per MIL-W-3970/19		GHz	dB			
001	2/			1.25 - 1.35	-	1.05	Al	5
002	3-006	54-003	54-003	26.5 - 40	.15	1.1	Cu	30
	3-008							
003	3-006	67-005	67-005	26.5 - 40	.15	1.1	Cu	---
	3-008							
004	3-010	67-006	67-006	33 - 50	.17	1.1	Cu	---
	3-012							
005	3-014	67-007	67-007	40 - 60	.19	1.1	Cu	---
	3-016							
006	3-017	67-008	67-008	50 - 75	.21	1.1	Cu	---
	3-019							
007	3-020	67-009	67-009	60 - 90	.23	1.1	Cu	---
	3-022							

1/ Cu = Copper alloy, Al = Aluminum alloy.

2/ M85/1-018, except B dimension shall be 1.000 and D dimension 1.500.

MIL-STD-1638A
21 August 1980

TABLE XVII. Waveguide assembly, rigid, 40-degree H-plane bend.

Dash No. M3970/20-	Waveguide M85/1-	Flange		Frequency range TE ₁₀ mode	Insertion loss max	VSWR max	Material	Pressurization lb _f /in. ² gage max
		1	2					
		M3970/20-						
001	018 1/	001, figure 1		GHz 1.25 - 1.35	dB .05	1.05	Aluminum alloy	5

1/ Except B dimension shall be 1.000 and D dimension shall be 1.500.

TABLE XVIII. Waveguide assemblies, rigid, cast.

Part No. M3970/	Frequency range TE ₁₀ mode (GHz)	VSWR (max)	Mates with standard rigid waveguide M85/1	Material 1/	Pressurization lb _f /in. ² gage (max)
<u>45-degree E-plane bend, full corral and self-jigging</u>					
21-001	8.2-12.4	1.08	077,078 178	Al	45
21-002	8.2-12.4	1.08	077,078 178	Al	45
<u>90-degree E-plane bend, full corral</u>					
22-001	3.95-5.85	1.05	053,054 174	Al	45
22-002	7.05-10.0	↓	069,073	Cu	↓
22-003	7.05-10.0		071,072 177	Al	
22-004	7.05-10.0		069,073	Cu	
22-005	7.05-10.0		071,072 177	Al	
22-006	8.2-12.4		075,079	Cu	
22-007	8.2-12.4		077,078 178	Al	
22-008	8.2-12.4		075,079	Cu	
22-009	8.2-12.4		077,078 178	Al	

See footnotes at end of table.

MIL-STD-1638A
21 August 1980

TABLE XVIII. Waveguide assemblies, rigid, cast - Continued.

Part No. M3970/	Frequency range TE ₁₀ mode (GHz)	VSWR (max)	Mates with standard rigid waveguide M85/1	Material 1/	Pressurization lb _f /in. ² gage (max)
<u>90-degree E-plane bend, full corral - Continued.</u>					
22-010	8.2-12.4	1.05	075,079	Cu	45
22-011	8.2-12.4	↓	077,078 178	Al	↓
22-012	12.4-18.0		087,089	Cu	
22-013	12.4-18.0		090,091 180	Al	
22-014	12.4-18.0		087,089	Cu	
22-015	12.4-18.0		090,091 180	Al	
22-016	26.5-40.0		007,008 2/	Cu	
22-017	26.5-40.0		009 2/	Al	
<u>90-degree E-plane bend, miter and radius-back miter, full corral</u>					
23-001	4.0-5.9	1.05	053,054 174	Al	20
23-002	4.0-5.9	1.05	051,055	Cu	20
23-003	8.2-12.4	1.05	077,078 178	Al	45
<u>45-degree E-plane bend, reduced height, full corral</u>					
24-001	8.2-12.4	1.08	---	Al	45
<u>90-degree E-plane bend, reduced height, radius-back miter, full corral</u>					
25-001	8.2-12.4	1.05	---	Al	45
<u>45-degree H-plane bend, full corral and self-jigging</u>					
26-001	8.2-12.4	1.05	077,078 178	Al	45
26-002	8.2-12.4	1.05	077,078 178	Al	45

See footnotes at end of table.

MIL-STD-1638A
21 August 1980

TABLE XVIII. Waveguide assemblies, rigid, cast - Continued.

Part No. M3970/	Frequency range TE ₁₀ mode (GHz)	VSWR (max)	Mates with standard rigid waveguide M85/1	Material 1/	Pressurization lb./in. ² gage (max)
<u>60-degree H-plane bend, full corral</u>					
27-001	12.4-18.0	1.05	090,091 180	Al	45
<u>90-degree H-plane bend, full corral</u>					
28-001	8.2-12.4	1.05	077,078 178	Al	45
<u>90-degree H-plane bend, miter and radius-back miter, full corral</u>					
29-001	8.2-12.4	1.04	077,078 178	Al	45
29-002	8.2-12.4	1.04	077,078 178	Al	45
<u>45-degree H-plane bend, reduced height, full corral</u>					
30-001	8.2-12.4	1.05	---	Al	45
<u>90-degree H-plane bend, reduced height, full corral</u>					
31-001	8.2-12.4	1.05	---	Al	45

1/ Cu = Copper alloy, Al = Aluminum.

2/ M85/3.

MIL-STD-1638A

TABLE XIX. Waveguide assemblies, flexible, twistable, class 1.

Part number M287/3- 1/	TE ₁₀ mode frequency range (GHz)	Minimum centerline bending radius (inch)		Insertion loss (dB/ft)	VSWR	Mates with standard rigid waveguide M85/1-	Flanges		Assembly material 2/	Pressur- ization, lb _f /in. ² gage
		E plane	H plane				Flange 1	Flange 2		
							M3922/	M3922/		
01-XXXX 02-XXXX 60-XXXX 3/	1.12-1.70	24.12	48.08	.005	1.10	017 018 017	58-007 58-008 58-007	58-007 58-008 58-009	Cu Al Cu	2
03-XXXX 04-XXXX 61-XXXX 3/	1.70-2.60	12.39	25.95	.01	1.10	031 029 031	58-009 58-010 58-009	58-009 58-010 58-009	Cu Al Cu	4
05-XXXX 06-XXXX 62-XXXX 3/	2.20-3.30	11.14	19.64	.015	1.10	037 035 037	58-011 58-012 58-011	58-011 58-012 58-011	Cu Al Cu	5
07-XXXX 08-XXXX 09-XXXX 10-XXXX 11-XXXX 12-XXXX 13-XXXX 14-XXXX 63-XXXX 3/	2.60-3.95	6.88	14.38	.02	1.10	043 041 043 041 043 041 043 041 043	64-001 64-002 56-001 56-002 61-002 61-001 61-002 61-001 61-002	64-001 64-002 56-001 56-002 56-001 56-002 61-002 61-001 56-001	Cu Al Cu Al Cu Al Cu Al Cu	15
15-XXXX 16-XXXX 17-XXXX 18-XXXX 19-XXXX 20-XXXX 21-XXXX 22-XXXX 64-XXXX 3/	3.95-5.85	4.94	12.04	.05	1.10	055 053 055 053 055 053 055 053 055	63-001 63-005 57-002 57-001 62-002 62-001 62-002 62-001 63-001	63-001 63-005 57-002 57-001 57-002 57-001 62-002 62-001 63-001	Cu Al Cu Cu Cu Al Cu Al Cu	30
23-XXXX 24-XXXX 25-XXXX 26-XXXX 27-XXXX 28-XXXX 29-XXXX 30-XXXX 65-XXXX 3/	5.85-8.20	3.88	9.25	.08	1.10	067 065 067 065 067 065 067 065 067	63-002 63-006 55-001 55-002 60-001 60-002 60-001 60-002 63-002	63-002 63-006 55-001 55-002 55-001 55-002 60-001 60-002 63-002	Cu Al Cu Al Cu Al Cu Al Cu	30
31-XXXX 32-XXXX 33-XXXX 34-XXXX 35-XXXX 36-XXXX 37-XXXX 38-XXXX 66-XXXX 3/	7.05-10.00	3.57	8.38	.08	1.15	073 071 073 071 073 071 073 071 073	63-003 63-007 53-002 53-004 59-007 59-009 59-007 59-009 63-003	63-003 63-007 53-002 53-004 53-002 53-004 59-007 59-007 63-003	Cu Al Cu Al Cu Al Cu Al Cu	30

See footnotes at end of table.

MIL-STD-1638A
21 August 1980TABLE XIX. Waveguide assemblies, flexible, twistable, class 1 - Continued.

Part number M287/3- 1/	TE ₁₀ mode frequency range (GHz)	Minimum centerline bending radius (inch)		Insertion loss (dB/ft)	VSWR	Mates with standard rigid waveguide M85/1-	Flanges		Assembly material 2/	Pressur- ization ₂ lb _f /in. gage
		E plane	H plane				Flange 1	Flange 2		
							M3922/	M3922/		
39-XXXX 40-XXXX 41-XXXX 42-XXXX 43-XXXX 44-XXXX 45-XXXX 46-XXXX 67-XXXX 3/	8.20-12.40	3.38	7.51	.1	1.15	079 .077 079 077 079 077 079 077 079	63-004 63-008 53-001 53-003 59-006 59-008 59-006 59-008 63-004	63-004 63-008 53-001 53-003 53-001 53-003 59-006 59-008 63-004	Cu Al Cu Al Cu Al Cu Al Cu	30
47-XXXX 48-XXXX 49-XXXX 50-XXXX 51-XXXX 52-XXXX 53-XXXX 68-XXXX 3/	12.40-18.00	2.75	5.75	.25	1.20	089 090 089 090 089 090 089 089	53-005 53-006 59-001 53-005 59-002 53-006 59-001 59-002 53-005 53-005	53-005 53-006 53-005 53-006 59-001 59-002 59-002 53-005 53-005	Cu Al Cu Al Cu Al Cu Cu Cu	30
54-XXXX 55-XXXX 56-XXXX 57-XXXX 58-XXXX 59-XXXX 69-XXXX 3/	18.0-26.5	2.33	4.5	.35	1.20	102 103 102 103 102 103 102	54-001 54-002 59-003 59-004 59-003 59-004 54-001	54-001 54-002 54-001 54-002 59-003 59-004 54-001	Cu Al Cu Al Cu Al Cu	30

1/ The last four digits shall indicate the nominal relaxed length.

2/ Cu = Copper alloy, Al = Aluminum alloy.

3/ The assemblies are constructed from beryllium copper and the flexure cycle is 10⁶ rather than 10⁵. All other characteristics are as listed.

MIL-STD-1638A
21 August 1980

TABLE XX. Waveguide assemblies, flexible, nontwistable, class 2.

Part number M287/4- 1/	TE ₁₀ mode frequency range (GHz)	Minimum centerline bending radius (inch)		Insertion loss (dB/ft)	VSWR	Mates with standard rigid waveguide M85/1-	Flanges		Assembly material 2/	Pressur- ization ² lb _f /in. gage
		E plane	H plane				Flange 1	Flange 2		
							M3922/ M3922/	M3922/ M3922/		
01-XXXX 02-XXXX 03-XXXX 64-XXXX 3/	1.12-1.70	13.02	27.07	.01	1.05	017 018 017 017	58-007 58-008 58-007 58-007	58-007 58-008 58-007 58-007	Cu Al Cu Cu	15
04-XXXX 05-XXXX 65-XXXX 3/	1.70-2.60	9.51	14.00	.015	1.07	031 029 031	58-009 58-010 58-009	58-009 58-010 58-009	Cu Al Cu	20
06-XXXX 07-XXXX 66-XXXX 3/	2.20-3.30	5.00	9.75	.018	1.09	037 035 037	58-011 58-012 58-011	58-011 58-012 58-011	Cu Al Cu	25
08-XXXX 09-XXXX 10-XXXX 11-XXXX 12-XXXX 13-XXXX 14-XXXX 15-XXXX 67-XXXX 3/	2.60-3.95	4.50	6.38	.02	1.10	043 041 043 041 043 041 043 041 043	64-001 64-002 56-001 56-002 61-002 61-001 61-002 61-001 64-001	64-001 64-002 56-001 56-002 56-001 56-002 61-002 61-001 64-001	Cu Al Cu Al Cu Al Cu Al Cu	30
16-XXXX 17-XXXX 18-XXXX 19-XXXX 20-XXXX 21-XXXX 22-XXXX 23-XXXX 68-XXXX 3/	3.95-5.85	3.00	5.50	.03	1.10	055 053 055 053 055 053 055 053 055	63-001 63-005 57-002 57-001 62-002 62-001 62-002 62-001 63-001	63-001 63-005 57-002 57-001 57-002 57-001 62-002 62-001 63-001	Cu Al Cu Al Cu Al Cu Al Cu	30
24-XXXX 25-XXXX 26-XXXX 27-XXXX 28-XXXX 29-XXXX 30-XXXX 31-XXXX 32-XXXX 69-XXXX 3/	5.85-8.20	2.50	5.00	.05	1.10	067 065 067 065 067 065 067 065 065 067	63-002 63-006 55-001 55-002 60-001 60-002 60-001 60-002 63-006 63-002	63-002 63-006 55-001 55-002 55-001 55-002 60-001 60-002 60-006 63-002	Cu Al Cu Al Cu Al Cu Al Al Cu	30

See footnotes at end of table.

MIL-STD-1638A
21 August 1980

TABLE XX. Waveguide assemblies, flexible, nontwistable, class 2 - Continued.

Part number M2B7/4- 1/	TE ₁₀ mode frequency range (GHz)	Minimum centerline bending radius (inch)		Insertion loss (dB/ft)	VSWR	Mates with standard rigid waveguide M85/1-	Flanges		Assembly material 2/	Pressur- ization ₂ lb _f /in. ² gage
		E plane	H plane				Flange 1	Flange 2		
							M3922/	M3922/		
33-XXXX 34-XXXX 35-XXXX 36-XXXX 37-XXXX 38-XXXX 39-XXXX 40-XXXX 70-XXXX 3/	7.05-10.0	1.75	3.49	.06	1.10	073 071 073 071 073 071 073 071 073	63-003 63-007 53-002 53-004 59-007 59-009 59-007 59-009 63-003	63-003 63-007 53-002 53-004 53-002 53-004 59-007 59-009 63-003	Cu Al Cu Al Cu Al Cu Al Cu	45
41-XXXX 42-XXXX 71-XXXX 3/	7.0-11.0	1.44	2.50	.08	1.10	155 157 155	70-001 70-002 70-001	70-001 70-002 70-001	Cu Al Cu	50
43-XXXX 44-XXXX 45-XXXX 46-XXXX 47-XXXX 48-XXXX 49-XXXX 50-XXXX 72-XXXX 3/	8.2-12.4	1.38	3.00	.1	1.10	079 077 079 077 079 077 079 077 079	63-004 63-008 53-001 53-003 59-006 59-008 59-006 59-008 63-004	63-004 63-008 53-001 53-003 53-001 53-003 59-006 59-008 63-004	Cu Al Cu Al Cu Al Cu Al Cu	60
51-XXXX 52-XXXX 53-XXXX 54-XXXX 55-XXXX 56-XXXX 57-XXXX 73-XXXX 3/	12.4-18.0	1.25	2.00	.25	1.13	089 090 089 090 089 090 090 089	53-005 53-006 59-001 59-002 59-001 59-002 53-006 53-005	53-005 53-006 53-005 53-006 59-001 59-002 53-006 53-005	Cu Al Cu Al Cu Al Al Cu	60
58-XXXX 59-XXXX 60-XXXX 61-XXXX 62-XXXX 63-XXXX 74-XXXX 3/	18.0-26.5	1.13	1.25	.50	1.15	102 103 102 103 102 103 102	54-001 54-002 59-003 59-004 59-003 59-004 54-001	54-001 54-002 54-001 54-002 59-003 59-004 54-001	Cu Al Cu Al Cu Al Cu	60

1/ The last four digits shall indicate the nominal relaxed length.

2/ Cu = Copper alloy, Al = Aluminum alloy.

3/ The assemblies are constructed from beryllium copper and the flexure cycle is 10^6 rather than 10^5 . All other characteristics are as listed.

MIL-STD-1638A

21 August 1980

TABLE XXI. Waveguide assemblies, extra-flexible, twistable, class 3.

Part number M287/5- 1/	TE ₁₀ mode frequency range (GHz)	Minimum centerline bending radius (inch)		Insertion loss (dB/ft)	VSWR	Mates with standard rigid waveguide M85/1-	Flanges		Assembly material 2/	Pressur- ization ² lb _f /in. gage
		E	H				Flange 1	Flange 2		
		plane	plane							
01-XXXX 02-XXXX 60-XXXX 3/	1.12-1.70	13.02	27.07	.025	1.10	017 018 017	58-007 58-008 57-007	58-007 58-008 57-007	Cu Al Cu	2
03-XXXX 04-XXXX 61-XXXX 3/	1.70-2.60	9.51	14.00	.035	1.10	031 029 031	58-009 58-010 58-009	58-009 58-010 58-009	Cu Al Cu	20
05-XXXX 06-XXXX 62-XXXX 3/	2.20-3.30	6.00	8.00	.05	1.10	037 035 037	58-011 58-012 58-011	58-011 58-012 58-011	Cu Al Cu	30
07-XXXX 08-XXXX 09-XXXX 10-XXXX 11-XXXX 12-XXXX 13-XXXX 14-XXXX 15-XXXX 63-XXXX 3/	2.60-3.95	4.50	6.38	.06	1.10	043 041 043 041 043 041 041 041 041 043	64-001 64-002 56-001 56-002 61-002 61-001 61-002 61-002 61-001 61-001 52-032 58-011	64-001 64-002 56-001 56-002 56-001 56-002 61-002 61-002 61-001 61-001 52-032 58-011	Cu Al Cu Al Cu Al Cu Al Al Al Al Cu	30
16-XXXX 17-XXXX 18-XXXX 19-XXXX 20-XXXX 21-XXXX 22-XXXX 23-XXXX 64-XXXX 3/	3.95-5.85	3.00	4.75	.07	1.10	055 053 055 053 055 053 055 053 055	63-001 63-005 57-002 57-001 62-002 62-001 62-002 62-001 62-001 63-001	63-001 63-005 57-002 57-001 57-002 57-001 62-002 62-001 62-001 63-001	Cu Al Cu Al Cu Al Cu Al Al Cu	45
24-XXXX 25-XXXX 26-XXXX 27-XXXX 28-XXXX 29-XXXX 30-XXXX 31-XXXX 65-XXXX 3/	5.85-8.20	2.50	4.75	.08	1.12	067 065 067 065 067 065 067 065 067 065 067	63-002 63-006 55-001 55-002 60-001 60-002 60-001 60-002 60-001 60-002 63-002	63-002 63-006 55-001 55-002 55-001 55-002 60-001 60-002 60-001 60-002 63-002	Cu Al Cu Al Cu Al Cu Al Al Al Cu	45
32-XXXX 33-XXXX 34-XXXX 35-XXXX 36-XXXX 37-XXXX 38-XXXX 39-XXXX 66-XXXX 3/	7.05-10.0	2.00	4.00	.08	1.15	073 071 073 071 073 071 073 071 073 071 073	63-003 63-007 53-002 53-004 59-007 59-009 59-007 59-007 59-009 59-009 63-003	63-003 63-007 53-002 53-004 53-002 53-004 59-007 59-007 59-007 59-009 63-003	Cu Al Cu Al Cu Al Cu Al Cu Al Cu	45

See footnotes at end of table.

MIL-STD-1638A
21 August 1980

TABLE XXI. Waveguide assemblies, extra-flexible, twistable, class 3 - Continued.

Part number M287/5- 1/	TE ₁₀ mode frequency range (GHz)	Minimum centerline bending radius (inch)		Insertion loss (dB/ft)	VSWR	Mates with standard rigid waveguide M85/1-	Flanges		Assembly material 2/	Pressur- ization ² lb _f /in. ² gage
		E plane	H plane				Flange 1	Flange 2		
							M3922/	M3922/		
40-XXXX 41-XXXX 42-XXXX 43-XXXX 44-XXXX 45-XXXX 46-XXXX 47-XXXX 67-XXXX 3/	8.2-12.4	1.38	2.25	.13	1.15	079 077 079 077 079 077 079 077 079	63-004 63-008 53-001 53-003 59-006 59-008 59-006 59-008 63-004	63-004 63-008 53-001 53-003 53-001 53-003 59-006 59-008 63-004	Cu Al Cu Al Cu Al Cu Al Cu	60
48-XXXX 49-XXXX 50-XXXX 51-XXXX 52-XXXX 53-XXXX 68-XXXX 3/	12.4-18.0	1.25	1.75	.3	1.20	089 090 089 090 089 090 089	53-005 53-006 59-001 59-002 59-001 59-002 53-005	53-005 53-006 53-005 53-006 59-001 59-002 53-005	Cu Al Cu Al Cu Al Cu	60
54-XXXX 55-XXXX 56-XXXX 57-XXXX 58-XXXX 59-XXXX 69-XXXX 3/	18.0-26.5	1.12	1.25	.35	1.20	102 103 102 103 102 103 102	54-001 54-002 59-003 59-004 59-003 59-004 54-001	54-001 54-002 54-001 54-002 59-003 59-004 54-001	Cu Al Cu Al Cu Al Cu	60

1/ The last four digits shall indicate the nominal relaxed length.

2/ Cu = Copper alloy, Al = Aluminum alloy.

3/ The assemblies are constructed from beryllium copper and the flexure cycle is 10⁶ rather than 10⁵.
All other characteristics are as listed.

MIL-STD-1638A
21 August 1980TABLE XXII. Waveguide assemblies, flexible, twistable, class 5.

Part number M287/6 1/	TE ₁₀ mode frequency range (GHz)	Minimum centerline bending radius (inch)		Insertion loss (dB/ft)	VSWR	Mates with standard rigid waveguide M23351/4-	Flanges		Assembly material 2/	Pressur- ization ₂ lb _f /in. ² gage
		E plane	H plane				Flange 1	Flange 2		
		M39000/	M39000/							
01-XXXX	3.5-8.2	3.5	7.0	.10	1.38	029	3-058	3-032	A1	30
02-XXXX	4.75-11.0	3.0	6.0	.15	1.38	033	3-070	3-044	A1	35
03-XXXX	7.5-18.0	2.0	4.0	.20	1.38	037	3-082	3-074	A1	45

1/ The last four digits shall indicate the nominal relaxed length.

2/ A1=Aluminum alloy.

TABLE XXIII. Waveguide assemblies, flexible-twistable, class 7.

Part number M287/7 1/	TE ₁₀ mode frequency range (GHz)	Minimum centerline bending radius (inch)		Insertion loss (dB/ft)	VSWR	Mates with standard rigid waveguide M23351/4-	Flanges		Assembly material 2/	Pressur- ization ₂ lb _f /in. ² gage
		E plane	H plane				Flange 1	Flange 2		
		M39000/	M39000/							
01-XXXX	3.5-8.2	3.00	6.00	.10	1.38	029	3-058	3-032	A1	30
02-XXXX	4.75-11.0	1.75	3.50	.15	1.38	033	3-070	3-044	A1	35
03-XXXX	7.5-18.0	1.625	3.25	.20	1.38	037	3-082	3-074	A1	45

1/ The last four digits shall indicate the nominal relaxed length.

2/ A1=Aluminum alloy.

MIL-STD-1638A
21 August 1980

TABLE XXIV. Waveguide assemblies, millimeter, flexible, nontwistable, class B.

Part number M287/8 1/	TE ₁₀ mode frequency range (GHz)	Minimum centerline bending radius (inch)		Insertion loss (dB/ft)	VSWR	Mates with standard rigid waveguide M85/3	Flanges		Assembly material 2/	Pressur- ization ₂ lb _f /in. ² gage
		E plane	H plane				Flange 1	Flange 2		
							M3922/	M3922/		
01-XXXX	26.5- 40.0	26.62	53.2	.05	1.30	006	59-005	54-003	Cu	60
02-XXXX	33.0- 50.0	13.75	27.0	.05	1.10	010	67-006	67-006	Cu	15
03-XXXX	40.0- 60.0	9.18	18.58	.08	1.10	014	67-007	67-007	Cu	15
04-XXXX	50.0- 75.0	7.64	15.28	.11	1.10	017	67-008	67-008	Cu	15
05-XXXX	60.0- 90.0	6.88	13.75	.20	1.12	020	67-009	67-009	Cu	20
06-XXXX	75.0- 110	6.88	13.75	.25	1.15	023	67-010	67-010	Cu	20

1/ The last four digits shall indicate the nominal relaxed length.

2/ Cu=Copper alloy.

MIL-STD-1638A
21 August 1980

TABLE XXV. Cross-reference of AN nomenclature to part number.

Type designation	Part number M3970/	Type designation	Part number M3970/
UG-712/U	13-001	UG-760/U	8-001
UG-713/U	13-002	UG-761/U	8-002
UG-714/U	13-003	UG-762/U	8-003
UG-715/U	13-004	UG-763/U	8-004
UG-716/U	13-005	UG-764/U	8-005
UG-717/U	13-006	UG-765/U	8-006
UG-718/U	13-007	UG-766/U	8-007
UG-719/U	13-008	UG-767/U	8-008
UG-720/U	13-009	UG-768/U	8-009
UG-721/U	13-010	UG-769/U	8-010
UG-722/U	13-011	UG-770/U	8-011
UG-723/U	13-012	UG-771/U	8-012
UG-724/U	13-013	UG-772/U	8-013
UG-725/U	13-014	UG-773/U	8-014
UG-726/U	13-015	UG-774/U	8-015
UG-727/U	13-016	UG-775/U	8-016
UG-728/U	5-001	UG-776/U	11-001
UG-729/U	5-002	UG-777/U	11-002
UG-730/U	5-003	UG-778/U	11-003
UG-731/U	5-004	UG-779/U	11-004
UG-732/U	5-005	UG-780/U	11-005
UG-733/U	5-006	UG-781/U	11-006
UG-734/U	5-007	UG-782/U	11-007
UG-735/U	5-008	UG-783/U	11-008
UG-736/U	5-009	UG-784/U	11-009
UG-737/U	5-010	UG-785/U	11-010
UG-738/U	5-011	UG-786/U	11-011
UG-739/U	5-012	UG-787/U	11-012
UG-740/U	5-013	UG-788/U	11-013
UG-741/U	5-014	UG-789/U	11-014
UG-742/U	5-015	UG-790/U	11-015
UG-743/U	5-016	UG-791/U	11-016
UG-744/U	9-001	UG-792/U	14-001
UG-745/U	9-002	UG-793/U	14-002
UG-746/U	9-003	UG-794/U	14-003
UG-747/U	9-004	UG-795/U	14-004
UG-748/U	9-005	UG-796/U	14-005
UG-749/U	9-006	UG-797/U	14-006
UG-750/U	9-007	UG-798/U	14-007
UG-751/U	9-008	UG-799/U	14-008
UG-752/U	9-009	UG-800/U	14-009
UG-753/U	9-010	UG-801/U	14-010
UG-754/U	9-011	UG-802/U	14-011
UG-755/U	9-012	UG-803/U	14-012
UG-756/U	9-013	UG-804/U	14-013
UG-757/U	9-014	UG-805/U	14-014
UG-758/U	9-015	UG-806/U	14-015
UG-759/U	9-016	UG-807/U	14-016

MIL-STD-1638A
21 August 1980TABLE XXV. Cross-reference of AN nomenclature to part number - Continued.

Type designation	Part number M3970/	Type designation	Part number M3970/
UG-808/U	12-001	UG-860/U	7-001
UG-809/U	12-002	UG-861/U	7-002
UG-810/U	12-003	UG-862/U	7-003
UG-811/U	12-004	UG-863/U	7-004
UG-812/U	12-005	UG-864/U	7-005
UG-813/U	12-006	UG-865/U	7-006
UG-814/U	12-007	UG-866/U	7-007
UG-815/U	12-008	UG-867/U	7-008
UG-816/U	12-009	UG-868/U	7-009
UG-817/U	12-010	UG-869/U	7-010
UG-818/U	12-011	UG-870/U	7-011
UG-819/U	12-012	UG-871/U	7-012
UG-820/U	12-013	UG-872/U	7-013
UG-821/U	12-014	UG-873/U	7-014
UG-822/U	12-015	UG-874/U	7-015
UG-823/U	12-016	UG-875/U	7-016
UG-824/U	6-001	UG-877/U	15-001
UG-825/U	6-002	UG-878/U	15-002
UG-826/U	6-003	UG-879/U	15-003
UG-827/U	6-004	UG-880/U	15-004
UG-828/U	6-005	UG-881/U	15-005
UG-829/U	6-006	UG-882/U	15-006
UG-830/U	6-007	UG-883/U	15-007
UG-831/U	6-008	UG-884/U	15-008
UG-832/U	6-009	UG-885/U	15-009
UG-833/U	6-010	UG-886/U	15-010
UG-834/U	6-011	UG-887/U	15-011
UG-835/U	6-012	UG-888/U	15-012
UG-836/U	6-013	UG-889/U	15-013
UG-837/U	6-014	UG-890/U	15-014
UG-838/U	6-015	UG-891/U	15-015
UG-839/U	6-016	UG-892/U	15-016
UG-844/U	16-001	UG-893/U	10-001
UG-845/U	16-002	UG-894/U	10-002
UG-846/U	16-003	UG-895/U	10-003
UG-847/U	16-004	UG-896/U	10-004
UG-848/U	16-005	UG-897/U	10-005
UG-849/U	16-006	UG-898/U	10-006
UG-850/U	16-007	UG-899/U	10-007
UG-851/U	16-008	UG-900/U	10-008
UG-852/U	16-009	UG-901/U	10-009
UG-853/U	16-010	UG-902/U	10-010
UG-854/U	16-011	UG-903/U	10-011
UG-855/U	16-012	UG-904/U	10-012
UG-856/U	16-013	UG-905/U	10-013
UG-857/U	16-014	UG-906/U	10-014
UG-858/U	16-015	UG-907/U	10-015
UG-859/U	16-016	UG-908/U	10-016

MIL-STD-1638A
21 August 1980

Custodians:

Army - ER
Navy - EC
Air Force - 11

Review activities:

Army - MI, AV,
Navy - OS
Air Force - 17, 99, 85
DLA - ES

User activities:

Army - AR
Navy - MC, CG, AS
Air Force - 19

Preparing activity:

Navy - EC

Agent:

DLA - ES

(Project 5985-0943)

FOLD

DEPARTMENT OF THE NAVY
NAVAL ELECTRONIC SYSTEMS COMMAND
WASHINGTON, D.C. 20360

POSTAGE AND FEES PAID
NAVY DEPARTMENT
DOD 316



OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE \$300

COMMANDER
NAVAL ELECTRONIC SYSTEMS COMMAND
DEFENSE STANDARDIZATION PROGRAM BRANCH
DEPARTMENT OF THE NAVY
WASHINGTON, D.C. 20360

FOLD

