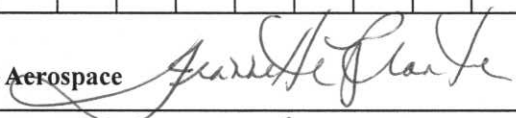
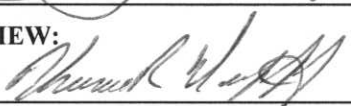
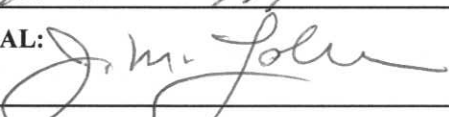
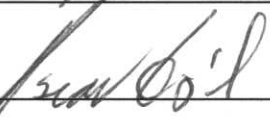


REVISIONS			
SYMBOL	DESCRIPTION	DATE	APPROVAL
-	Original Issue	7/30/97	

SHEET REVISION STATUS

SH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REV	—	—	—	—	—	—	—	—												
SH	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REV																				

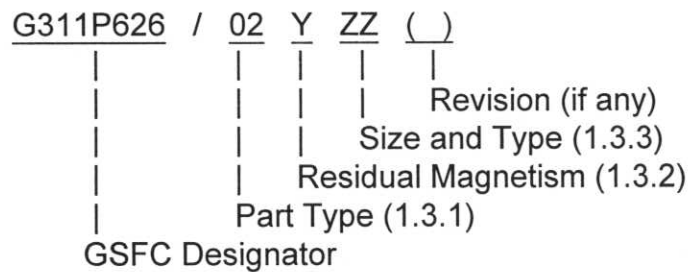
ORIGINATOR: J. Plante/Swales Aerospace 		DATE 7/28/97	FSC: 5935
TECHNICAL REVIEW: T. R. Duffy/Unisys 		7/29/97	Connector Adapter, Electric, Miniature D Rectangular, Polarized Shell, Standard and High Density, Electromagnetic Interference Filter Contacts
CODE 311 APPROVAL: J. M. Lohr/GSFC 		7/29/97	
CODE 311 SUPERVISORY APPROVAL: R. L. Chinnapongse/GSFC 		7/29/97	
ADDITIONAL APPROVAL: Oscar Gonzalez/GSFC Code 738 		7/29/97	S-311-P-626/02
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION GODDARD SPACE FLIGHT CENTER GREENBELT, MARYLAND 20771 CAGE CODE: 25306			

1. SCOPE

1.1 Purpose. This specification covers the detail provisions for D type EMI filter pin/socket connector adapters having multiple non-removable contacts. These connectors are for use in space flight hardware and critical ground support equipment (GSE) applications.

1.2 GSFC General Specification. Unless otherwise noted, all provisions of GSFC specification S-311-P-626 apply to this specification.

1.3 Connector Type Designation. The connector type designation shall be as follows:



1.3.1 Part Type. A two digit number referring to this detail specification.

1.3.2 Residual Magnetism. A single letter which indicates the maximum level of residual magnetism in accordance with the latest issue of GSFC S-311-P-626.

1.3.3 Size and Type. A two placed identifier, the first place of which is a single digit indicating the shell size as listed in Table I. The second place is a single digit which indicates the type as listed in Table II.

2. APPLICABLE DOCUMENTS

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

SPECIFICATIONS

Military

MIL-M-14	Molding Compounds, Thermosetting
MIL-G-14450	Copper Plating (Electrodeposited)
MIL-M-24519	Molding Compounds, Thermoplastic
MIL-C-39029/57	Contacts, Electrical, Connectors, Socket, Crimp Removable
MIL-C-39029/58	Contacts, Electrical, Connectors, Pin, Crimp Removable
MIL-G-45204	Gold Plating, Electrodeposited
MS14004	Insert Arrangements, Electrical Connector, Shell Size 6
MS18270	Connectors, Electrical, Rectangular, Miniature, Polarized Shell, Rack and Panel, Shell, Receptacle, Socket Contacts, Crimp Type
MS18271	Connectors, Electric, Rectangular, Miniature, Polarized Shell, Rack and Panel, Shell, Plug, Pin Contacts, Crimp Type

MS18273	Insert Arrangements, Electrical Connector, Shell Size 1
MS18274	Insert Arrangements, Electrical Connector, Shell Size 2
MS18275	Insert Arrangements, Electrical Connector, Shell Size 3
MS18276	Insert Arrangements, Electrical Connector, Shell Size 4
MS18277	Insert Arrangements, Electrical Connector, Shell Size 5
MS18281	Contacts, Pin and Socket, Class G, N and H, Solder Type, Non-Removable

NASA

GSFC

S-311-P-4/07	Connectors, Electrical, Rectangular, Subminiature, Rack and Panel, Detailed Specification for
S-311-P-4/08	Connectors, Electrical, Polarized Shell, Rack and Panel, For Space Flight Use
S-311-P-10	Connectors, Electrical, Rectangular, Miniature, Polarized Shell, Rack and Panel, for Space Flight Use
S-311-P-626	Connectors, Electric, Miniature Polarized Shell, Rack and Panel, Pin, Electromagnetic Interference Filter Contact, Nonmagnetic, Solder Type

STANDARDS

Military

MIL-STD-220	Method of Insertion-Loss Measurement
MIL-STD-889	Dissimilar Metals
MIL-STD-1285	Marking of Electrical and Electronic Parts

OTHER PUBLICATIONS

Industry

ASTM B-19	Brass Sheet, Strip, Plate and Disk
ASTM B-36	Brass Plate, Sheet, Strip, and Rolled Bar

(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.)

3. REQUIREMENTS

3.1 Qualification. Connectors furnished under this specification shall be products which are qualified to the requirements of GSFC S-311-P-626 and this detail specification.

3.2 Materials. Connectors shall be constructed of materials as specified herein.

3.2.1 Contact Materials and Plating. The contacts shall be made from a copper base alloy. Contact bodies shall be overall gold-plated 50 microinches thick minimum, in accordance with MIL-G-45204, Type II, Grade C, Class 1, over nickel.

3.2.2 Shell Materials and Finish. The connector shells shall be non-magnetic. The preferred base metal is brass in accordance with ASTM B-19 or ASTM B-36. Gold plating in accordance with MIL-G-45204, Type II, Grade C, Class 1 over copper flash in accordance with MIL-C-14550 is preferred. The finish used shall meet the requirements of the base specification and MIL-STD-889, Table I, for compatibility with the above gold plating in marine and industrial environments . The finish shall:

- (a) Provide good electrical contact when used as a terminal or conductor.
- (b) Have uniform texture and appearance.
- (c) Be adherent.
- (d) Be free from blisters, pinholes, and other defects that may affect the protective value of the finish.

3.2.3 Insert. The insert shall be made of diallyl phthalate in accordance with MIL-M-14, polyester in accordance with MIL-M-24519, Type GPT-30F or GET-30F or other material which will allow the finished connector to meet the requirements of this specification including thermal vacuum outgassing.

3.3 Design and Physical Dimensions. The design and physical dimensions shall conform to the design standards indicated in Table I.

Table I. Dimensions and Configurations of the Shells and Inserts

Size 1/	Plug MS Number	Receptacle MS Number	Insert MS Number	Contact Size	Number of Contacts
1	MS18271-1	MS18270-1	MS18273-2	22D	15
2	MS18271-2	MS18270-2	MS18274-2	22D	26
3	MS18271-3	MS18270-3	MS18275-2	22D	44
4	MS18271-4	MS18270-4	MS18276-2	22D	62
5	MS18271-5	MS18270-5	MS18277-2	22D	78
6	MS18271-6	MS18270-6	MS14004-1	22D	104
A	MS18271-1	MS18270-1	MS18273-2	20	9
B	MS18271-2	MS18270-2	MS18274-2	20	15
C	MS18271-3	MS18270-3	MS18275-2	20	25
D	MS18271-4	MS18270-4	MS18276-2	20	37
E	MS18271-5	MS18270-5	MS18277-2	20	50

1/ Use for the first digit in the two digit size and type designator (1.3.3). Sizes 1 through 6 are high density configurations and A through E are standard density configurations.

3.3.1 Contact Design. Contact mating dimensions shall be in accordance with MS18281-2 for size 20 contacts and in accordance with MIL-C-39029/57 and MIL-C-39029/58 for size 20D contacts.

3.3.2 Contact Arrangement. The contact arrangement shall be per Table I.

3.3.3 Shell Design. The shell shall be designed to positively retain the insert and shall be so

constructed that the insert cannot be removed. These adapters shall mate with connectors which use the same shells, inserts and contacts described in Table 1 and 3.3.1.

3.3.4 Connector Sleeve. The plug and receptacle shall be connected by a connector sleeve. The sleeve shall be designed as to positively retain the connector components after assembly.

3.3.4.1 Sleeve Dimensions. The sleeve shall add a maximum of 0.65 inches to the combined front to back dimensions of the plug and receptacle (See Figure 1).

3.3.4.2 Sleeve Material. The sleeve shall be made of the same materials and platings used for the connector shells or shall meet the Table I compatibility rating for marine or industrial atmospheres of MIL-STD-889.

3.4 Performance.

3.4.1 Capacitance. Capacitance shall be within the values shown in Table II. The test shall be performed at 1 kHz and 1 Vrms.

TABLE II. Electrical Characteristics

Type 1/	Rated Voltage (V)	Filter Type	Capacitance (pF)		Max 3dB Cut-off (MHz)	Minimum	Insertion	Loss	(dB) 2/
			Min	Max		20 MHz	50 MHz	100 MHz	200 MHz
0	100	Pi	270	330	17	3	6	12	21
1	100	Pi	900	1100	8	6	14	21	33

Type 1/	Rated Voltage (V)	Filter Type	Impedance (Ohms)			
			Test Frequency (MHz)			
9	100	Ferrite Bead	5	25	100	300
			15	30	50	75

1/ Use for the second digit in the two digit size and type designator (1.3.1)

2/ Test shall be performed at 25°C with No Load

3.4.2 Dissipation Factor. For parts containing capacitors, the dissipation factor shall be 5% maximum.

3.4.3 Dielectric Withstanding Voltage. The dielectric withstanding voltage shall meet or exceed twice the rated voltage specified in 3.4.8. Charging current shall not exceed 50 milliamperes.

3.4.4 Insulation Resistance.

3.4.4.1 Insulation Resistance at 25°C. 1000 megaohms minimum between any pair of contacts and between any contact and the shell.

3.4.4.2 Insulation Resistance at 125°C. 100 megohms minimum between any pair of contacts and between any contact and the shell.

3.4.5 Current Rating. The current rating for sizes 1 through 6 shall be 5.0 amps maximum per contact. For sizes A through E, the current rating shall be 3.0 amps maximum per contact.

3.4.6 Attenuation and Impedence. For parts containing capacitors, the insertion loss shall be not less than the values specified in Table II when tested in accordance with MIL-STD-220 and the base specification. For parts containing only ferrite beads for filtering, impedance shall be measured in accordance with the purchase order.

3.4.7 Contact Resistance. 20 milliohms maximum at a contact current of 5 amps DC for standard density styles (sizes A through E) and 3 amps DC for high density styles (size 1 through 6).

3.4.8 Rated Voltage. 100 volts DC maximum.

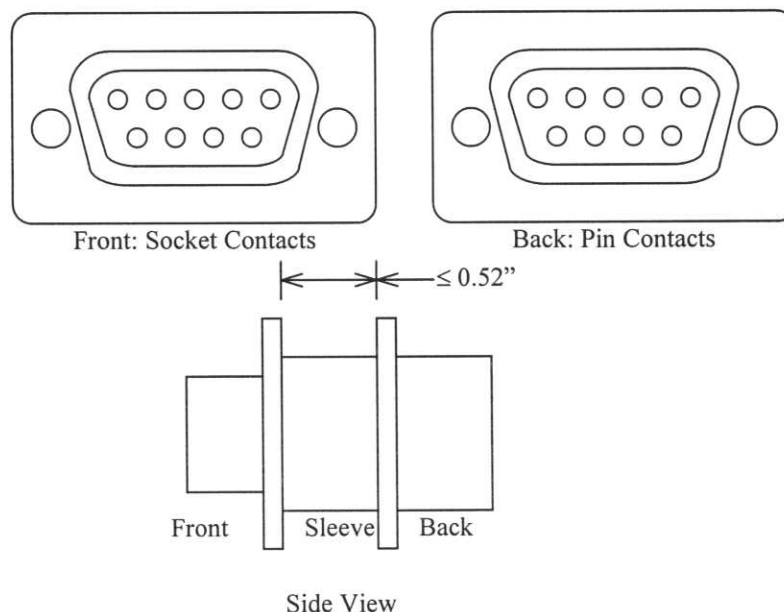
3.4.9 Temperature Range. -55°C to +125°C.

3.5 Thermal Vacuum Outgassing. The connector adapters supplied to this specification shall meet the requirements of the base specification. A vacuum bake preconditioning, to ensure compliance with this requirement, is allowed.

3.6 Marking.

3.6.1 Insert Marking. Raised or depressed characters may be used. Markings shall be in accordance with insert arrangement listed in Table I and MIL-STD-1285.

Figure 1. Adapter Configuration



4. QUALITY ASSURANCE PROVISIONS

4.1 Quantity of Samples for Qualification or Requalification. A total of four samples shall be used for qualification or requalification.

4.1.1 RF Current Rating. RF Current rating testing is not applicable.

4.1.2. Solderability. Solderability testing is not required.

4.1.3 Impedance Measurements. For ferrite bead styles (type 9), impedance shall be measured instead of capacitance.

4.1.4 Residual Magnetism. The Residual Magnetism test shall be performed in the sequence shown in Table I of the base specification. The test method shall be that described in S-311-P-10, paragraph 4.5.5. Residual Magnetism levels shall not exceed the gamma value specified by the part number (See 1.3.2).

4.2 Quality Conformance Inspection. Quality conformance inspection shall be performed on 100% of the parts to be delivered.

4.2.1 Exceptions for Ferrite Bead Types. For ferrite bead styles (type 9), impedance shall be measured instead of capacitance. Voltage conditioning and temperature cycling shall be replaced by a 48 hour bake at the maximum rated temperature.

4.2.2 Mate/Demate Force. Each connector supplied to this specification shall be tested in accordance with paragraph 4.8.13 of S-311-P-626. The mating and unmating forces shall comply with the limits shown in table III.

Table III. Mating and Unmating Forces (pounds)

Shell Size	Unmating		Mating
	Minimum	Maximum	Maximum
1	0.75	6.0	10.0
2	1.00	10.0	17.0
3	1.75	17.0	28.0
4	2.5	24.0	39.0
5	3.25	30.0	49.0
6	4.50	39.0	65.0

4.3 Methods of Examination and Test. Connectors and contacts shall be examined in accordance with GSFC-S-311-P-626 including the applicable requirements of this specification.

5. PREPARATION FOR DELIVERY

5.1 Applicable Documents. All connectors manufactured to this specification shall be delivered in accordance with the requirements of the latest revision of GSFC S-311-P-626 and the purchase document.

6.NOTES

6.1 Ordering Data. Procurement documents shall be in accordance with GSFC S-311-P-626 and include the connector shell material and finish listed in 3.2.2 of this specification.

6.2 Intended Application. This specification covers miniature D, standard and high density, connector adapters which are intended for use with parts qualified and supplied to GSFC specification S-311-P-4/07 and S-311-P-4/09.

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