NOV 13 '74

REVISIONS

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A	217860	Exceptions requested by Vendor	11Dec74	acm

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SIGNATURES	DATES
PREPARED BY A.C. Massi	25 JUL 74
COMPONENT ENG. H.E. Morris	25 JUL 74
MECH. DESIGN [illegible]	25 JUL 74
ELECT. DESIGN R. Zgurich	25 JULY 74
PROJECT C Pierce	31 July 74

LITTON SYSTEMS, INC.
AERO PRODUCTS DIVISION
21050 SUBRANK BOULEVARD • WOODLAND HILLS, CALIFORNIA 91364

TITLE: CONNECTOR, PLUG AND RECEPTACLE, ELECTRICAL, RECTANGULAR

SIZE	CODE IDENT NO.	NUMBER	REV
A	30782	503004	A

SCALE

SHEET 1 OF 15

1.0 SCOPE

1.1 This document describes the minimum requirements for rectangular, rack and panel electrical connectors with nonremovable solder type contacts.

1.2 These parts are assigned Litton APD part numbers in Table I.

2.0 APPLICABLE DOCUMENTS

2.1 The following documents form a part of this drawing to the extent specified herein. Unless otherwise indicated, the issue in effect on the date of invitation for bids shall apply.

SPECIFICATIONS AND STANDARDS

Federal

QQ-P-35	Passivation Treatments for Austenitic, Ferritic, and Martensitic Corrosion - Resisting Steel (Fastening Devices)
QQ-N-290	Nickel Plating, Electrodeposited
QQ-P-416	Plating, Cadmium (Electrodeposited)
QQ-C-530	Copper Beryllium Alloy Strip (Copper Alloy Number 170 and 172)
QQ-B-750	Bronze, Phospher; Bar, Plate, Rod, Sheet, Strip, Flatwire, and Structural and Special Shaped Sections
QQ-S-763	Steel Bars, Shapes, and Forgings, Corrosion Resisting
QQ-S-764	Steel Bars, Corrosion Resisting, Free Machining
QQ-S-766	Steel Plates, Sheets, and Strip-Corrosion-Resisting

Military

MIL-M-14	Plastic Molding Material and Plastic Molded Parts, Glass Fiber Filled, Diallyl Phthalate Resin
MIL-C-28748	Connectors, Electrical, Rectangular, Rack and Panel, Solder Type and Crimp Type Contacts, General Specification for
MIL-G-45204	Gold Plating, Electrodeposited
MIL-C-45662	Calibration Systems Requirements

Military, Cont'd

MIL-STD-105 Sampling Procedures and Tables for Inspection by Attributes

MIL-STD-1285 Marking of Electrical and Electronic Parts

MIL-STD-1344 Test Methods for Electrical Connectors

3.0 REQUIREMENTS

3.1 Detail Requirements. The parts described in this document shall meet the performance requirements of MIL-C-28748 and as specified herein. In the event of conflict, the requirements of this document shall govern.

3.2 Qualification. The individual parts procured to this document shall be procured from a manufacturer whose parts are qualified in accordance with 4.4.

3.2.1 Supplier Conformance After Qualification Approval. Manufacturers supplying parts to this document shall conform to the following requirements after receiving qualification approval. Failure to conform to these requirements will be sufficient reason to withdraw approval from that manufacturer.

a. Advise Litton APD in writing which lots will be affected, prior to making any changes in part number, material, design, processing, or construction. Written approval from Litton APD shall be obtained prior to making any major changes.

b. Obtain written approval from Litton APD prior to the fabrication of parts at a facility or location different from that used to fabricate the approved qualification samples.

3.3 Materials. A material shall be used which will enable the parts specified herein to meet the performance requirements of this document. When applicable, the material shall be as specified herein. Acceptance or approval of any constituent material shall not be construed as a guaranty of the acceptance of the finished product.

3.3.1 Insert Material. Insert material shall be diallyl phthalate conforming to type SDG-F or GDI-3 of MIL-M-14.

3OF

3.3.2 Contacts. Contacts shall have solder terminations.

3.3.2.1 Pin Contatcs. Size, see figure 1.

3.3.2.1.1 Material. Phosphor bronze in accordance with QQ-B-750, composition 260, temper hard.

3.3.2.1.2 Finish. Gold plated in accordance with MIL-G-45204, Type I, Grade C, Class 1, (0.000050 inch minimum to 0.000100 inch maximum) over nickel plate in accordance with QQ-N-290, Class 2, 0.000040 inch minimum to 0.000100 inch maximum.

3.3.2.2 Socket Contacts. Open entry type, shall be capable of accepting a 0.030 ± 0.001 inch diameter pin and meet the mechanical and electrical requirements as specified.

3.3.2.2.1 Material. Beryllium copper in accordance with QQ-B-530 alloy 172, temper 1/2 hard.

3.3.2.2.2 Finish. Same as 3.3.2.1.2.

3.3.3 Contact Retaining Clip Spring. Contact retaining clip spring shall be beryllium copper in accordance with QQ-C-530(or phosphor bronze in accordance with QQ-B-750), gold plated in accordance with MIL-G-45204, Type I, Class 0, Grade C over Nickel in accordance with QQ-N-290, Class 2, see 3.3.2.1.2.

3.3.4 Jackscrew Hardware. Jacksrcew hardware, except nuts specified washers, shall be corrosion resistant steel, Class 303 or 303e, in accordance with QQ-S-764, passivated. Nuts and lockwashers may be corrosion resistant steel or brass in accordance with QQ-B-626, composition 260, temper 1/2 hard and shall be cadmium plated in accordance with type II, Class 3 of QQ-P-416; lockwasher shall be phosphor bronze in accordance with QQ-B-750, composition "A", temper hard and shall be cadmium plated in accordance with QQ-P-416, type II, Class 3 for Figure 3 and 4.

3.3.4.1 Jackscrew Hardware. Jackscrew hardware, except washers, shall be corrosion resistant steel in accordance with QQ-S-764, passivated. Washers shall be corrosion resistant steel in accordance with QQ-S-766, passivated.

3.4 Design and Construction. Connectors shall be of the design and construction specified for the figure of Table I. Contacts shall have solder terminations. Socket contacts shall be capable of accepting a 0.030 ± 0.001 inch diameter pin and meet the requirements specified herein.

3.4.1 Insert Design. Inserts shall be one-piece construction and shall be such that they will not crack, chip or break in normal service or assembly. The insert dimensions, contact identification and arrangement shall be as specified for the figure of Table I. Letters shall be raised and clearly legible or shall appear in legible contrasting colors and shall appear on the front and rear faces of each insert. Letters of the socket insert shall correspond with that of the mating pin insert.

3.4.2 Current rating. The maximum current rating shall be 5.0 amperes.

3.4.3 Wire Size. Contact solder cups shall be capable of accepting to number 22 AWG stranded wire size for soldering.

3.5 Performance. Connectors shall be designed to meet the performance requirements specified in MIL-C-28748 and as specified herein.

3.5.1 Operating Temperature. Connectors shall be suitable for operation throughout a temperature range of $-55^{o}C$ to $125^{o}C$.

3.5.2 Insulation Resistance. When connectors are tested as specified in 4.7.2, the insulation resistance shall be not less than 5,000 megohms.

3.5.3 Dielectric Withstanding Voltage. When connectors are tested as specified in 4.7.3, connectors shall withstand 1000 volts RMS 60 Hz initially and 300 volts RMS 60 Hz after conditioning at sea level without any evidence of flashover or breakdown.

3.5.4 Thermal Shock. When connectors are tested as specified in 4.7, there shall be no evidence of physical damage and connectors shall meet the initial dielectric withstanding voltage requirement of 3.5.3.

3.5.5 Humidity. When connectors are tested as specified in 4.7, the insulation resistance shall be not less than 1000 megohms and connectors shall meet the after conditioning dielectric withstanding voltage requirements of 3.5.3.

3.5.6 Vibration. When connectors are tested as specified in 4.7, there shall be no cracking, breaking, or loosening of parts. During the test, there shall be no loss of electrical continuity of any of the contact circuits of more than one microsecond.

3.5.7 Shock. When connectors are tested as specified in 4.7, there shall be no cracking, breaking, or loosening of parts. During the test, there shall be no loss of electrical continuity of any of the contact circuits of more than one microsecond.

TABLE I

LITTON APD PART NO.	CONFIG. FIG. NO.	NUMBER OF CONTACTS	CONTACT TYPE	WIRE TERMINATION	INSERT ARRANGEMENT FIGURE NO.
503004-1	1	34	Pin	Solder Cup	5
-2	3	34	Socket	Solder Cup	5
-3	4	34	Pin	Solder Cup	5
-4	2	34	Socket	Solder Cup	5

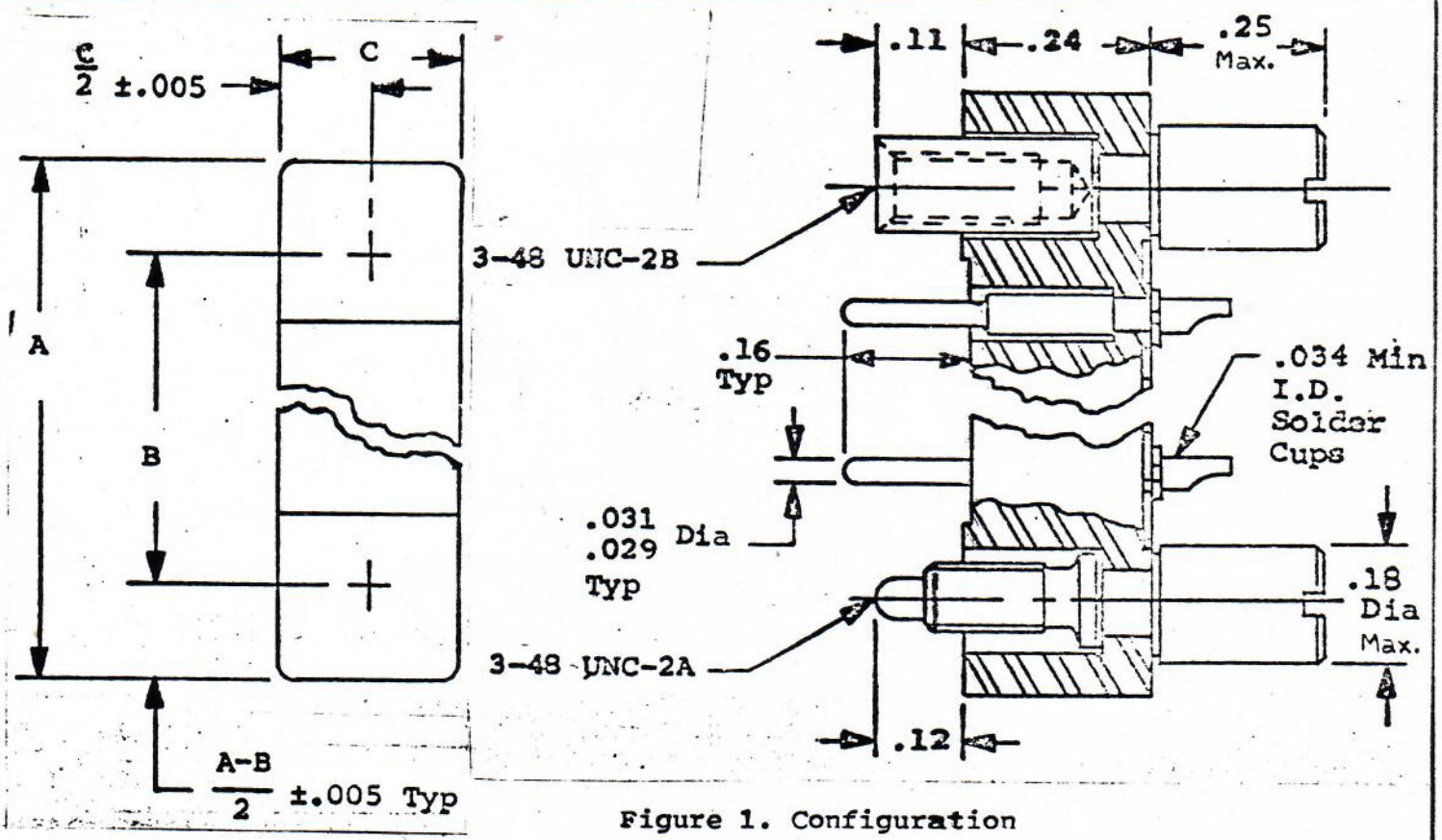


Figure 1. Configuration

NOTE:

Contact "A" Location:
a. On Pin body: Female Jackscrew
b. On Socket body: Male Jackscrew

No. of Contacts	A	B	C
34	1.25	1.032	.39

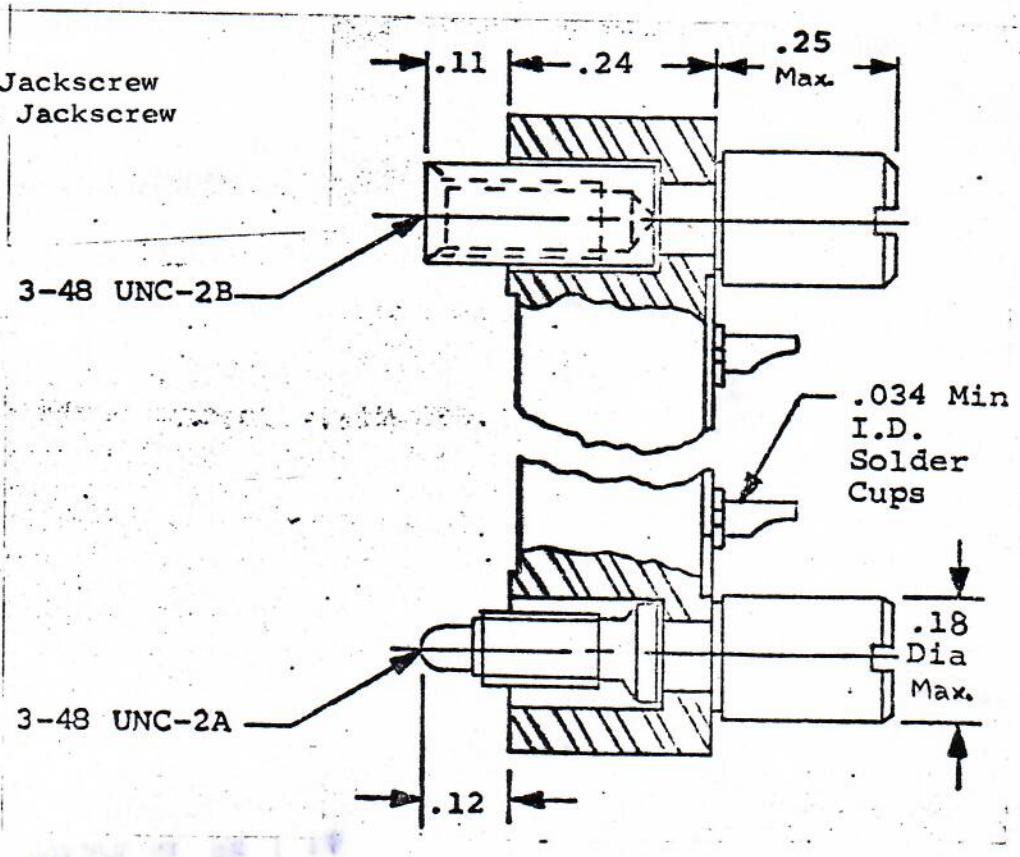


Figure 2. Configuration

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON
.XX ± .02
.XXX ± .005
ANGLES ±

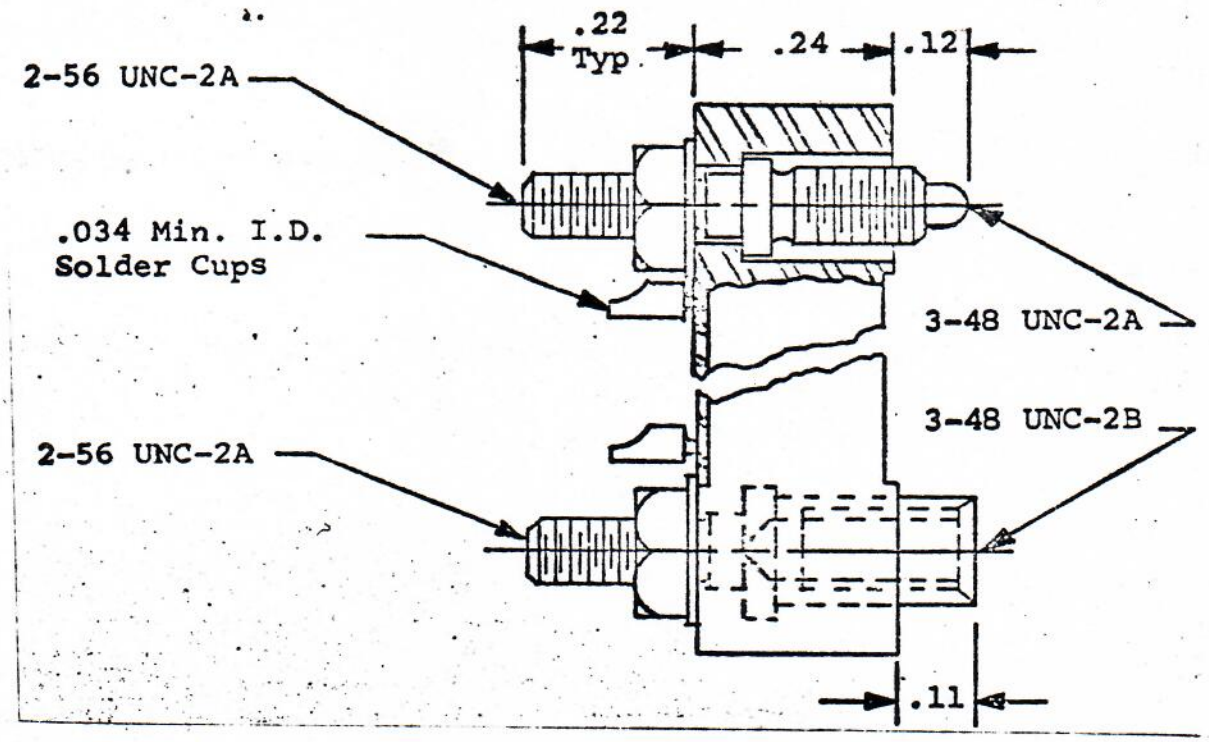


Figure 3. Configuration

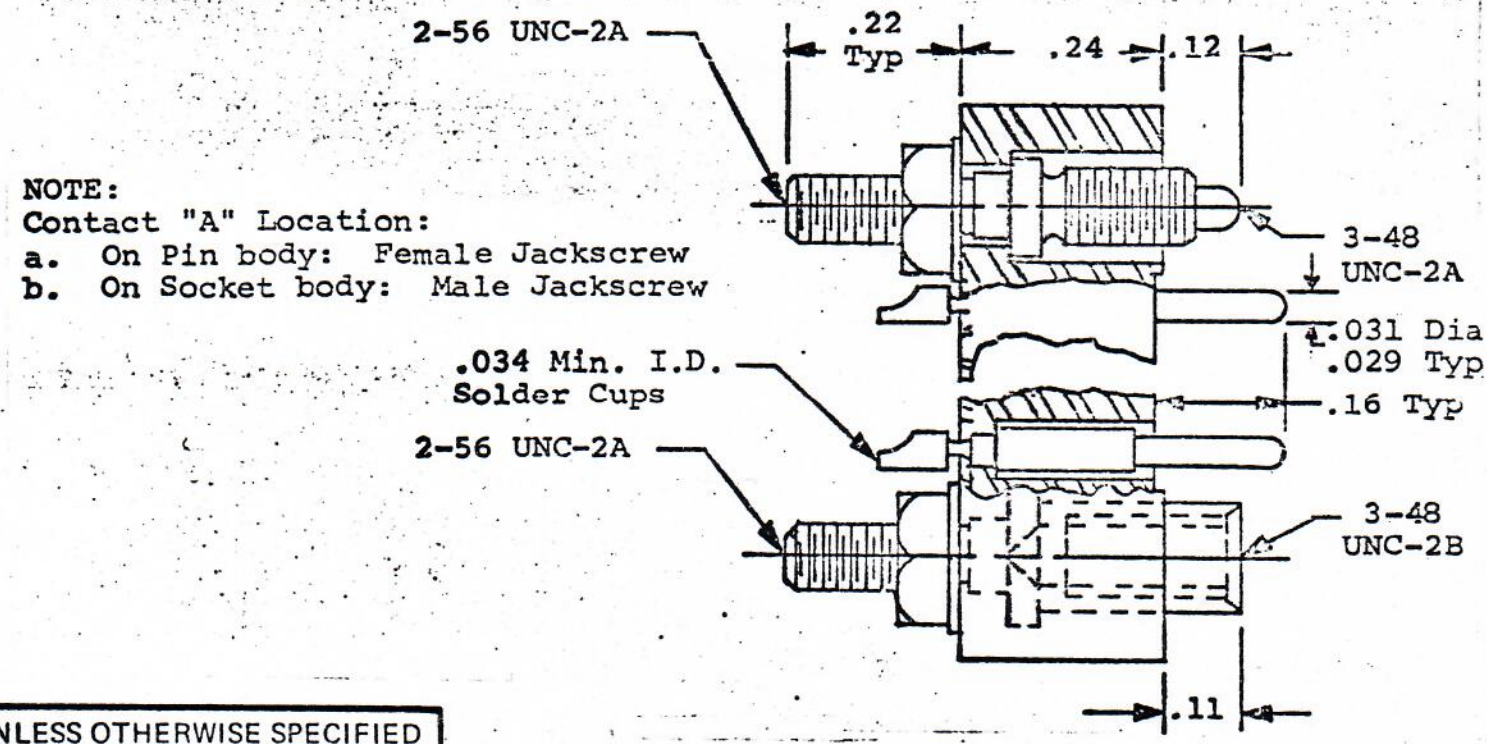


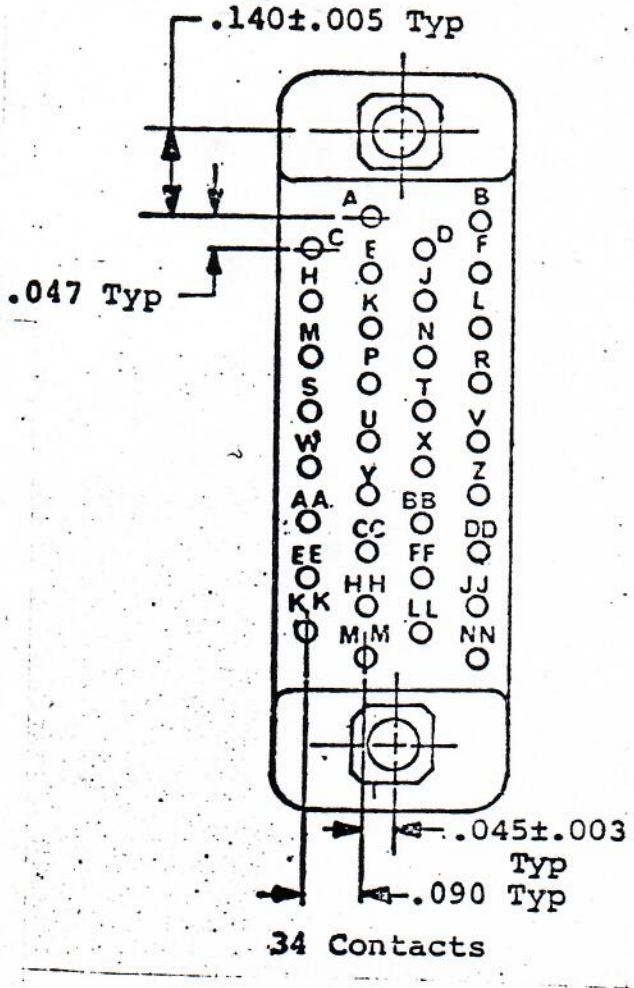
Figure 4. Configuration

UNLESS OTHERWISE SPECIFIED

DIMENSIONS ARE IN INCHES
TOLERANCES ON
.XX ± .02
.XXX ± .005
ANGLES ±

	SIZE	CODE IDENT NO.	NUMBER	REV
Litton AERO PRODUCTS 21050 Burbank Boulevard, Woodland Hills, California 91364	A	30782	503004	A
ANY RESTRICTIVE AND/OR OTHER PROTECTIVE NOTICES, IF ANY, ON THE SHEET FOR WHICH THIS SHEET SERVES AS A CONTINUATION ARE HEREBY INCORPORATED HEREIN.	SCALE		SHEET 8	

FORM # APD 103-2



Mating Face of Female Moldings shown. Male Moldings Reverse Image

Figure 5. Insert Arrangement

Litton AERO PRODUCTS 21050 Burbank Boulevard, Woodland Hills, California 91364	SIZE A	CODE IDENT NO. 30782	NUMBER 503004	REV A
ANY RESTRICTIVE AND/OR OTHER PROTECTIVE NOTICES, IF ANY, ON THE SHEET FOR WHICH THIS SHEET SERVES AS A CONTINUATION ARE HEREBY INCORPORATED HERON.	SCALE		SHEET 9	

FORM # APD 103-2

3.5.8 Insertion and Withdrawal Force. When connectors are tested as specified in 4.7, the force required to mate or unmate any pair of mated connectors (plug and receptacle) shall not exceed one pound times the number of contacts.

3.5.9 Durability. When connectors are tested as specified in 4.7, there shall be no evidence of electrical or mechanical damage that impairs the normal operation of the connector.

3.5.10 Low Level Circuit. When contacts are tested as specified in 4.7, the mated millivolt drop shall not vary more than ±25 percent from one another or from the millivolt drop of 3.5.11.

3.5.11 Mated Millivolt Drop (Contact Resistance). When contacts are tested as specified in 4.7, the mated millivolt drop shall not exceed 60 millivolts.

3.5.12 Salt Spray. When connectors are tested as specified in 4.7, there shall not be sufficient corrosion to interfere with mating or unmating the connectors or exposure of base metal on pin or socket contacts. Following the test, the connectors shall meet the after conditioning dielectric withstanding voltage requirement of 3.5.3.

3.5.13 Contact Separating Forces. When tested as specified in 4.7, the forces required to withdraw the pins shall be 9.0 ounces maximum and 0.5 ounces minimum.

3.6 Marking. Connectors shall be marked in accordance with MIL-STD-1285, with the following information:

a. Litton APD part number and code identification
b. Date code
c. Manufacturer's code identification or symbol

3.7. Workmanship. Connectors, contacts, guide pin, guide sockets and hardware shall be processed in such a manner as to be uniform in quality and shall be free from defects that will affect life, serviceability or appearance. There shall be no evidence of poor molding or fabricating, damaged or improperly assembled contacts, peeling or chipping of the plating of finish, nicks and burrs of metal parts surfaces and no post molding warpage of connectors. The contacts shall be free from such burrs or sharp corners that would damage the plating or mating connectors.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for Inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by Litton APD. Litton APD 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 sufficeint accuracy, quality and quantity to permit performance of the required inspection shall be established and maintained by the supplier. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with MIL-C-45662.

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

a. Qualification inspection (see 4.4).

b. Quality conformance inspection (see 4.6).

4.3 Inspection Conditions and Preparation of Samples

4.3.1 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-1344.

4.4 Qualification Inspection. Qualification inspection shall consist of performing tests as specified in table II.

4.4.1 Qualification Samples. The number of units comprising a sample of connectors to be submitted for qualification inspection shall be as specified in table II. The sample shall be taken at random from a production run and shall be produced with equipment and procedures normally used in production.

4.4.2 Qualification Test Routine. Connectors shall be subjected to the qualification inspection tests specified in Table II in the order shown. Test requirements and methods shall be as specified.

4.4.3 Defectives. Defeetives in excess of those allowed in Table II shall be cause for refusal to grant qualification.

4.5 Periodic Inspection. Periodic inspection shall consist of the tests specified in groups I, III and a combination of II and IV except Vibration, Shock and Salt Spray.

The inspection shall be performed on connectors selected from lots that have been subjected to group A inspection. Periodic inspection tests need not be performed by the supplier, but will be performed periodically by Litton APD on this or a similar part manufactured by the supplier. These tests will be performed at least once during each calendar year that this part is manufactured by the supplier.

4.5.1 Periodic Inspection Sampling Plan. Four connectors normally produced in the previous 12 month period shall be inspected by Litton APD. Four connectors shall be subjected to the examinations and tests of group I, two to group III and two to the combination of tests specified in groups II and IV.

4.5.2 Disposition of Connectors. Connectors which have been subjected to periodic inspection shall not be submitted for production.

4.5.3 Noncomplicance. Failure of any periodic inspection test may be sufficient reason to withdraw approval from that manufacturer for that connector and similar connectors. The manufacturer is responsible for determining the cause of failure and necessary corrective action. Aftercorrective action has been taken and before any new connectors may bedelivered to Litton, twice the number of connectors from the group in which the failure occurred shall be subjected by the manufacturer to tests necessary to demonstrate the adequacy of the corrective action. Final acceptance shall be withheld until such testing has indicated that the corrective action was successful. After final acceptance, the corrective action shall be incorporated on all connectors offered for delivery to Litton.

4.6 Acceptance Inspection

4.6.1 Inspection of Product for Delivery. Inspection of product for delivery shall consist of group A inspection.

4.6.1.1 Inspection Lot. An inspection lot shall consist of all connectors and related contacts of the same style and part numbers, produced under essentially the same conditions, and offered for inspection at one time.

4.6.1.2 Group A Inspection. Group A inspection shall consist of the examinations and tests specified in Table III in the order shown.

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

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

4.7 Test Methods. Test methods shall be in accordance with MIL-C-28748 and as specified herein. In the event of conflict between the requirements of MIL-C-28748 and the requirements of this document, the latter shall govern. When mated connectors are specified in the test method, mating connectors shall be in accordance with 6.2.

4.7.1 Visual and Mechanical Examination. Connectors shall be examined to verify that the design requirements, construction, materials dimensions, marking, and workmanship are in accordance with the applicable requirements.

4.7.2 Insulation Resistance. Unmated connectors shall be tested in accordance with method 3001 of MIL-STD-1344. The following details shall apply:

a. Duration of application of test voltage - 1 minute, maximum

4.7.3 Dielectric Withstanding Voltage. Unmated connectors shall be tested in accordance with method 3001 of MIL-STD-1344. The following details shall apply:

a. Nature of potential - AC

b. Points of application of test voltage - Between contacts alternately connected, between contacts and body, and between contacts and guide pins and guide sockets.

TABLE II. QUALIFICATION INSPECTION

Examination or Test	Requirement Paragraph	Test Method Paragraph	Number of Sample Units to be Inspected	Number of Failures Allowed
Group I				
Visual and Mechanical Examination	3.4, 3.4.1, 3.6, 3.7	4.7.1	7	1
Insulation Resistance	3.5.2	4.7.2		
Dielectric Withstanding Voltage	3.5.3	4.7.3		
Group II				
Thermal Shock	3.5.4	4.7		
Vibration	3.5.6	4.7	2	0
Shock	3.5.7	4.7		
Group III				
Low Level Circuit	3.5.10	4.7		
Mated Millivolt Drop (contact resistance)	3.5.11	4.7		
Insertion and Withdrawal Force	3.5.8	4.7	2	0
Durability	3.5.9	4.7		
Group IV				
Humidity	3.5.5	4.7	2	0
Contact Separating Forces (Socket contacts only)	3.5.13	4.7		
Salt Spray	3.5.12	4.7		

5. PREPARATION FOR DELIVERY

5.1 Preservation and Packaging. Unless otherwise specified, connectors and removable crimp-type contacts shall be afforded preservation and packaging in accordance with Level C of MIL-C-28748.

5.2 Packing. Unless otherwise specified, connectors shall be packaged in accordance with Level C of MIL-C-28748.

5.3 Marking. Unit packages, intermediate packages (if any), and exterior shipping containers shall be durably marked in a legible manner. Marking shall be applied in such a manner that it will not be rendered illegible when the package is opened. Package marking shall include the same information that is required for part marking in addition to the following:

a. Purchase order number (on intermediate packages and exterior containers only).

b. Quantity of parts in container (on intermediate packages and exterior shipping containers only).

c. Any special marking required by purchase order.

6. NOTES

6.1 Authorized Vendors. Authorized vendors shall be in accordance with Litton APD Authorized Vendor Parts List.

TABLE III. GROUP A INSPECTION

Examination or Test	Requirement Paragraph	Test Method Paragraph	AQL (Percent Defective)	
			Major	Minor
Visual and Mechanical Examination	3.4,3.4.1, 3.6, 3.7	4.7.1	1%	4%
Insulation Resistance	3.5.2	4.7.2		
Dielectric Withstanding Voltage	3.5.3	4.7.3		
Contact Separating Forces (Socket contacts only)	3.5.13	4.7		

CROSS REFERENCE TABLE - LITTON DWG 503004

LITTON P/N	CONTINENTAL P/N
503004-1	LMM34-22PGDFSL-50NI
503004-2	XLMM34-22SGDFS-50NI
503004-3	LMM34-22PGDFS-50NI
503004-9	XLMM34-22SGDFSL-50NI