

MILITARY SPECIFICATION

CONNECTORS, PLUGS AND RECEPTACLES, ELECTRICAL, TRIAXIAL,  
RADIO FREQUENCY, GENERAL SPECIFICATION FOR

This amendment forms a part of MIL-C-49142, dated 17 April 1978, and is approved  
for use by all Departments and Agencies of the Department of Defense

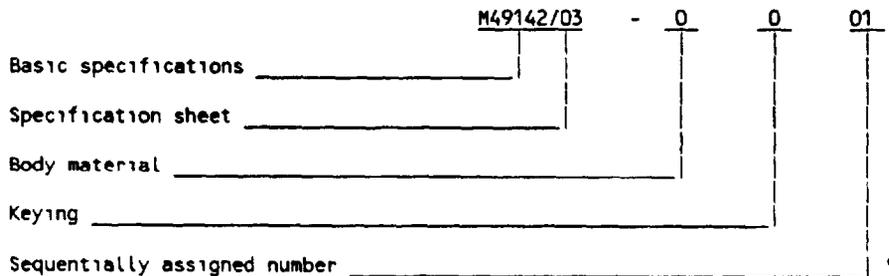
PAGE 1

Title, delete and substitute "CONNECTORS, PLUGS AND RECEPTACLES, ELECTRICAL, TRIAXIAL, RADIO FREQUENCY,  
GENERAL SPECIFICATION FOR "

1 2 2, delete and substitute

"1 2 2 Part or Identifying Number (PIN) The PIN shall consist of the letter "M" followed by the basic  
specification sheet number and a four digit dash number. The first digit of the dash number designates the  
material of the connector body (shell), "0" for brass and "3" for corrosion resistant steel. The second  
digit of the dash number designates modified bayonet coupling mechanism keying when applicable (see  
figure 1). The third and fourth digits of the dash number are sequentially assigned

Example



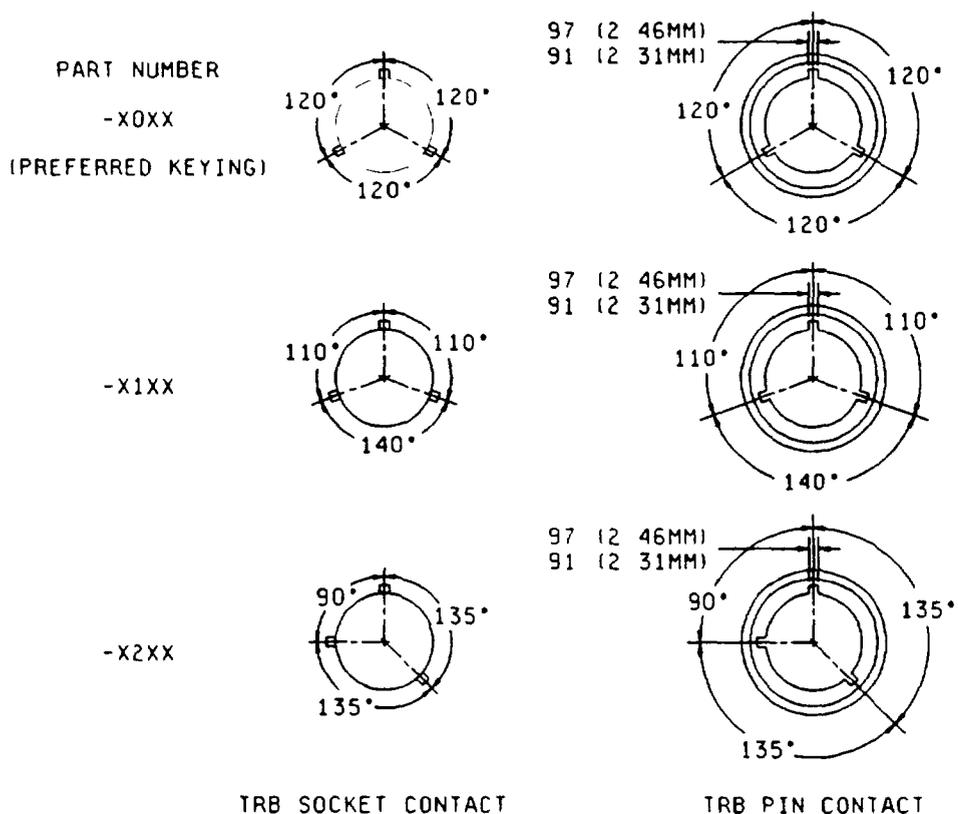
MIL-C-49142  
 AMENDMENT 3

Add 1 2 3 as follows

"1 2 3 Categories The categories of connectors shall be designated by an "A" (field serviceable) and "G" (field replaceable crimp center and outer contact) (see 3 1)

- a Category A Connectors which do not require special tools to assemble shall be designated as category A connectors Standard wrenches, soldering equipment, pliers, etc , are not defined as special tools
- b Category G Connectors which require only standard military crimp tools for the center contact and outer ferrule The intermediate contact shall be assembled by a means other than solder Piece parts are not defined Stripping dimensions shall be given in the assembly instructions "

Add figure 1 as follows



NOTES

- 1 Bayonets shall be dimensioned in accordance with MIL-STD-348, unless otherwise specified
- 2 Tolerance on all angles shall be  $\pm 1^\circ$

FIGURE 1 Keying configurations (TRB) only

Delete the following Federal Specification reference

"QQ-A-225/6 - Aluminum Alloy Bar, Rod, and Wire, Rolled, Drawn or Cold finished, 2024 "

PAGE 3

TABLE I, delete and substitute the following

" TABLE I. Materials.

Component material	Applicable specification
Brass .....	ASTM-B-16, ASTM-B-36, ASTM-B-121 or ASTM-B-124
Copper beryllium .....	ASTM-B-194, ASTM-B-196 or ASTM-B-197
Phosphor bronze .....	ASTM-B-139
Soft copper .....	ASTM-B-152
Copper .....	NW-T-799
Steel, corrosion resisting .....	QQ-S-763, ASTM-A-484 or ASTM-A-582
Flux .....	O-F-499
PTFE fluorocarbon .....	ASTM-D-1457
FEP fluorocarbon .....	ASTM-D-2116
Silicon rubber .....	ZZ-R-765
Silver solder .....	QQ-B-654
Soft solder .....	QQ-S-571

3 3 1, delete and substitute the following

"3.3.1 Finish Unless otherwise specified, center contacts and bodies shall be plated in the following manner"

"3.3.1.1 Center contacts. Center contacts shall be gold plated to a minimum thickness of 0.000050 inch in accordance with MIL-G-45204, type II, class 1 over a 0.000050 inch minimum nickel underplate in accordance with QQ-N-290, class 1. Plating of the internal surfaces of the contact shall be of sufficient thickness to ensure the intended performance of the contact is met and is to be uniform in appearance. A silver underplate shall not be permitted.

NOTE: No PIN changes will be made as a result of this plating change. The change will be tracked via the manufacturer's date code.

Change effectivity. Unless otherwise specified (see 3.1), this plating change shall become effective for new manufactured product not later than 12 months from the date of this specification.

Disposition of stock. Manufacturers and their selling agents and distributors may ship from stock connectors which were manufactured and qualified to the previous amendment (2) up to 30 months from the date of this specification."

"3 3 1.2 Connector bodies All brass bodied connectors shall be silver plated in accordance with QQ-S-365 to a minimum thickness of 0 000200 inch over a copper underplate All corrosion resistant steel bodied connectors shall be passivated in accordance with QQ-P-35 The requirements of MIL-F-14072 must be met under 3 3 1 finish."

3.3.2, delete "MIL-f-14072(SigC)" and substitute "MIL-STD-889".

PAGE 18

4 6 22 2, add the following at the beginning of the paragraph

"The rise time degradation shall be measured in accordance with the following procedure or a method acceptable to the Government "

MIL-C-49142  
AMENDMENT 3

Section 4, delete paragraphs 4. through 4.5.1.2.1.4 and substitute the following:

"4. QUALITY ASSURANCE PROVISIONS

"4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, 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 this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

"4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

"4.1.2 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 inspection requirements specified herein are classified as follows.

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

"4.3 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in the "GENERAL REQUIREMENTS" of MIL-STD-202 or MIL-STD-1344. For each test of threaded coupling connectors, where the test is performed on mated pairs, the pair shall be torqued to the specified value (see 3.1).

"4.4 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.

"4.4.1 Sample size. Twenty five class 1 connectors of the same part number with its mating connector or fifteen class 2 connectors of the same part number with its mating connector (see 1.2.1) shall be subjected to qualification inspection.

"4.4.2 Group qualification. For group qualification of all series of connectors covered by this specification, see 3.1. Group qualification will be limited to those connectors for which evidence of manufacturing capability is demonstrated by providing engineering drawings to the qualifying agency. The Government reserves the right to authorize performance of any or all qualification inspection of additional types in the group that are considered necessary for qualification within each group.

"4.4.3 Inspection routine. The sample shall be subjected to the inspections specified in table II. All sample units shall be subjected to the inspection of group 1. The sample units shall then be divided equally into six groups of 5 units (class 1) or three units each (class 2) and subjected to the inspection for their particular group and in the sequence given for that group.

"4.4.4 Failures. One or more failures shall be cause for refusal to grant qualification approval.

"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 item. If during 3 consecutive reporting periods there has been no production, the manufacturer may be required, at the discretion of the qualifying activity, to submit a representative product from each group, as defined by 4.4.2 to testing in accordance with the qualification inspection requirements."

"TABLE II. Qualification inspection

Examination or test	Requirement paragraph	Test method paragraph
<u>Group I</u>		
Visual and mechanical examination	3.1	4.6.1
Material	3.3	4.6.1
Finish	3.3.1	4.6.1
Dissimilar metals	3.3.2	4.6.1
Design and construction (dimensions)	3.4	4.6.1.1
Marking	3.27	4.6.1
Workmanship	3.28	4.6.1
Mating (Visual indications)	3.4.2	4.6.1
Force to engage/disengage	3.5	4.6.2
Bayonet and threaded type	3.5.1	4.6.2.1
Push-on connector types	3.5.2	4.6.2.2
Coupling proof torque <u>1/</u>	3.6	4.6.3
Mating characteristics	3.7	4.6.4
Permeability of nonmagnetic materials	3.8	4.6.5
Hermetic seal <u>2/</u>	3.9	4.6.6
Leakage <u>2/</u>	3.10	4.6.7
Insulation resistance	3.11	4.6.8
<u>Group II</u>		
Conductor retention <u>3/</u>	3.12	4.6.9
Salt spray (corrosion)	3.13	4.6.10
<u>Group III</u>		
Dielectric withstanding voltage	3.14	4.6.11
Vibration, high frequency <u>4/</u>	3.15	3.6.12
Shock (specified pulse) <u>4/</u>	3.16	4.6.13
Thermal shock	3.17	4.6.14
Moisture resistance	3.18	4.6.15
Conductor resistance	3.19	4.6.16
<u>Group IV</u>		
Corona level <u>4/</u>	3.20	4.6.17
RF high potential withstanding voltage <u>4/</u>	3.21	4.6.18
Cable retention force	3.22	4.6.19
Coupling mechanism retention force	3.23	4.6.20
<u>Group V</u>		
RF Leakage <u>4/</u>	3.24	4.6.21
Risetime degradation	3.25	4.6.22
Connector durability	3.26	4.6.23
<u>Group VI</u>		
Conductor resistance	3.19	4.6.16

1/ Threaded connectors only

2/ Pressurized connectors only

3/ Captivated center conductor only.

4/ These tests to be performed only during initial qualification as long as the qualifying design and manufacturing process has not been changed."

MIL-C-49142  
 AMENDMENT 3

"4.5 Retention of qualification To retain qualification, the contractor shall forward a report at 12- or 36-month intervals, as indicated below, 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. Groups A and B shall be submitted every 12 months 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 qualification verification inspection, group C, shall be submitted every 36 months including the number and mode of failures. The summary shall include results of all qualification verification inspection tests performed and completed during the 36-month period. If the summary of the test results indicates 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 12- or 36-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 12- or 36-month period that the inspection data indicates failure of the qualified product to meet the requirements of this specification.

"4.5 Quality conformance inspection

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

"4.5.1.1 Inspection lot. An inspection lot shall consist of all connectors of the same PIN produced under essentially the same conditions, and offered for inspection at one time.

"4.5.1.2 Group A inspection. Group A inspection shall consist of the inspections specified in table III in the order shown.

"4.5.1.2.1 Sampling plan (group A). Table III tests shall be performed on a production lot basis. Samples shall be selected in accordance with table IV. If one or more defects are found, the lot shall be screened for that particular defect and defects removed. A new sample of parts shall be selected in accordance with table IV and all group A tests again performed. If one or more defects are found in the second sample, the lot shall be rejected and shall not be supplied to this specification."

"TABLE III. Group A inspection.

Inspection	Requirement paragraph	Test method paragraph	Sampling procedure
Visual and mechanical examination			See table IV
Material	3.3	4.6.1	
Finish <sup>1/</sup>	3.3.1	4.6.1	
Dissimilar metals	3.3.2	4.6.1	
Design and construction	3.4.	4.6.1	
Marking	3.27	4.6.1	
Workmanship	3.28	4.6.1	
Plating (visual indication)	3.4.2	4.6.1	
Dielectric Withstanding voltage	3.14	4.6.11	
Hermetic seal (pressurized connectors only) <sup>2/</sup>	3.9	4.6.6	
Leakage (pressurized connectors only) <sup>2/</sup>	3.10	4.6.7	

<sup>1/</sup> Verification of finish may be accomplished using the manufacturer's process controls providing these controls are clearly equal to or more stringent than the requirements of this specification.

<sup>2/</sup> Pressurized connectors only.

"4.5.1.2.2 Visual inspection (group A inspection) Each connector shall be visually examined for completeness, workmanship, and identification requirements. Attention shall be given to those assemblies that require a gasket to determine the condition of the gasket. Gaskets missing, twisted, buckled, kinked, or damaged in any way shall be cause for rejection."

"TABLE IV. Inspection Level

Lot size	Visual and mechanical inspection	
	Major	Minor <sup>1/</sup>
1 to 8	All	5
9 to 15	All	5
16 to 25	20	5
26 to 50	20	5
51 to 90	20	7
91 to 150	20	11
151 to 280	20	13
281 to 500	47	16
501 to 1,200	47	19
1,201 to 3,200	53	23
3,201 to 10,000	68	29
10,001 to 35,000	77	35
35,001 to 150,000	96	40
150,001 to 500,000	119	40
500,001 and over	143	40

<sup>1/</sup> Samples may be pulled from either the production lot itself or from samples pulled from the lot for major defect testing."

"NOTES.

1. Major defect: A major defect is a defect, other than critical, that is likely to result in failure, or to reduce materially the usability of the unit of product for its intended purpose.
2. Minor defect: A minor defect is a defect that is not likely to reduce materially the usability of the unit of product for its intended purpose, or is a departure from established standards having little bearing on the effective use or operation of the unit.
3. Critical defect: A critical defect is a defect that judgment and experience indicate is likely to result in hazardous or unsafe conditions for individuals using, maintaining, or depending upon the product; or a defect that judgment and experience indicate is likely to prevent performance of the tactical function of a major end item such as a ship, aircraft, tank, missile, or space vehicle.

"4.5.1.3 Group B inspection Group B inspection shall consist of the inspections specified in table V in the order shown, and shall be made on sample units which have been subjected to and passed the group A inspection. Connectors having identical piece parts may be combined for lot purposes and shall be in proportion to the quantity of each PIN numbered adapter produced.

"4.5.1.3.1 Group B sampling plan. A sample of parts shall be randomly selected in accordance with table VI. If one or more defects are found, the lot shall be screened for that particular defect and defects removed. After screening and removal of defects, a new sample of parts shall be randomly selected and subjected to all tests in accordance with table V. If one or more defects are found in the second sample, the lot shall be rejected and shall not be supplied to this specification."

"TABLE V Group B inspection.

Inspection	Requirement paragraph	Test method paragraph
Force to engage/disengage	3.5	4.6.2
Bayonet and threaded type	3.5.1	4.6.2.1
Push-on connector type	3.5.2	4.6.2.2
Coupling proof torque <sup>1</sup>	3.6	4.6.3
Mating characteristics	3.7	4.6.4
Permeability of nonmagnetic materials	3.8	4.6.5
Insulation resistance	3.11	4.6.8

1/ Threaded connectors only.

"TABLE VI. Inspection level

Lot size	Sample size	VSWR sample size
1 to 8	5	1
9 to 15	5	1
16 to 25	5	2
26 to 50	5	2
51 to 90	5	3
91 to 150	11	3
151 to 280	13	3
281 to 500	16	3
501 to 1,200	19	5
1,201 to 3,200	23	5
3,201 to 10,000	29	5
10,001 to 35,000	35	5
35,001 to 150,000	40	8
150,001 to 500,000	40	8
500,001 and over	40	8

"4.5.1.3.2 Disposition of sample units. Sample units which have passed all the group B inspection may be delivered on the contract or purchase order, if the lot is accepted. Any connector deformed or otherwise damaged during testing shall not be delivered on the contract or order.

"4.5.2 Periodic inspection. Periodic inspection shall consist of group C. Except where the results of these inspections show noncompliance with the applicable requirements (see 4.5.2.1.4), delivery of products which have passed groups A and B shall not be delayed pending the results of these periodic inspections.

"4.5.2.1 Group C inspection Group C inspection shall consist of the inspections specified in table VII, in the order shown. Group C inspection shall be made on sample units selected from inspection lots which have passed the groups A and B inspection

"4.5.2.1.1 Sampling plan Fifteen sample units of the same PIN shall be selected from the first lot produced after the date of notification of qualification. Thereafter, fifteen sample units of the same part number shall be selected from current production after 200 000 connectors have been produced, or not less than once every year, whichever occurs first. The sample units shall be divided equally and subjected to the inspections of the six subgroups

"4.5.2.1.2 failures If one or more sample units fails to pass group C inspection, the lot shall be considered to have failed

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

"4.5.2.1.4 Noncompliance If a sample fails to pass group C inspection, the manufacturer shall notify the qualifying activity and the cognizant inspection activity of such failure and take corrective action on the materials or processes, or both, as warranted, and on all units of product which can be corrected and which are manufactured under essentially the same materials and processes, and which are considered subjected to the same failure. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the qualifying activity has been taken. After the corrective action has been taken, group C inspection shall be repeated on additional sample units (all tests and examinations, or the test which the original sample failed, at the option of the qualifying activity). Groups A and B inspections may be reinstated, however, final acceptance and shipment shall be withheld until the group C inspection has shown that the corrective action was successful. In the event of failure after reinspection, information concerning the failure shall be furnished to the cognizant inspection activity and the qualifying activity."

\*TABLE VII Group C inspection.

Inspection	Requirement paragraph	Test method paragraph
Subgroup 1		
Conductor retention <u>1/</u>	3.12	4.6.9
Salt spray (corrosion)	3.13	4.6.10
Subgroup 2		
Dielectric withstanding voltage	3.14	4.6.11
Vibration, high frequency <u>2/</u>	3.15	4.6.12
Shock (specified pulse) <u>2/</u>	3.16	4.6.13
Thermal shock	3.17	4.6.14
Moisture resistance	3.18	3.6.15
Conductor resistance	3.19	4.6.16
Subgroup 3		
Corona Level <u>2/</u>	3.20	4.6.17
RF high potential withstanding voltage <u>2/</u>	3.21	4.6.18
Cable retention force	3.22	4.6.19
Coupling mechanism retention force	3.23	4.6.20
Subgroup 4		
RF Leakage <u>2/</u>	3.24	4.6.21
Risetime degradation	3.25	4.6.22
Connector durability	3.26	4.6.23
Subgroup 5		
Conductor resistance	3.19	4.6.16

1/ Captivated center conductor only.

2/ These tests to be performed only during initial qualification as long as the qualifying design and manufacturing process has not been changed "

MIL-C-49142  
AMENDMENT 3

NOTE The margins of this amendment have been highlighted to indicate where changes (additions, modifications, corrections, deletions) from the previous amendment were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous amendment.

CONCLUDING MATERIAL

Custodians

Army - CR  
Navy - EC  
Air Force - 85  
NASA - NA

Review activities

Army - AT, AR, MI  
Navy - AS, MC, OS, SH  
Air Force - 17, 19, 99  
DLA - ES

Preparing activity  
DLA - ES

(Project 5935-3980)