1 INTRODUCTION

1.1 Purpose

Testing was performed on Glenair Series 80 connectors to determine conformance to the requirements of Product Specification 809-009 and MIL-DTL-38999.

1.2 Scope

This report covers electrical, mechanical and environmental performance testing of Glenair Series 80 connectors. The information in this report was obtained from a series of tests conducted by Environmental Associates, Santa Ana, California, National Technical Systems, Fullerton, California, and DNB Engineering, Fullerton, California. Additional tests were conducted at NuSil Technology, Carpenteria, California, Glenair UK Ltd., Mansfield, England and Glenair Inc., Glendale, California. These documents are on file at Glenair, Glendale California and are available upon request.

Testing Agency	Location	Date	Description of Test	Document Reference
NuSil Technology	Carpenteria, CA	October 17, to October 27, 2003	Outgassing property of fluorosilicone rubber seals	52558
Glenair UK Ltd.	Mansfield, England	June 17, 2002	Gunfire Vibration	TR32-0502
Glenair UK Ltd.	Mansfield, England	June 12,2002	Breakdown Voltage at 70K ft	TR43-0602
National Technical Systems	Fullerton, CA	October 3, 2006	Series 803 Qualification	679-4971-2 91906188
Environment Associates	Santa Ana, CA	October 2, 2006	Series 804 Qualification	OC18224-0412997 91906189
Environment Associates	Santa Ana, CA	October 5, 2006	Series 801 Qualification	OC18222-0412996 91906187
National Technical Systems	Fullerton, CA	September 20, 2006	High Frequency EMI Shielding Effectiveness	679-4971-1
DNB Engineering, Inc.	Fullerton, CA	January 15, 2007	Shielding Effectiveness Test report for Series 801, 804, and 805 Connectors	TR055797/70095
Environment Associates	Santa Ana, CA	June 22, 2007	Series 805 Qualification	6220701 OC18985-0213529

1.3 Conclusion

The Series 80 connectors have been shown to be capable of meeting the requirements of Glenair Product Specification 809-009.

1.4 Product Description

The Series 80 connector is a multi-pin circular electrical connector intended for application on aerospace equipment, tactical military equipment, and harsh environment commercial equipment. The Series 80 connector family includes Series 800 threaded coupling (UNF threads), Series 801 threaded coupling (ACME double-start threads), Series 802 submersible with threaded coupling, Series 803 bayonet coupling, Series 804 push-pull coupling and Series 805 triple-start ACME threaded coupling. The contact system and retention system conform to aerospace grade design practice, with rigid dielectric insulators captivating metal contact retaining clips. Rubber face seals and grommets are bonded to the rigid dielectric.

1.5 Test Specimens

Two mated pairs of three connector sizes (small, medium and large) for Groups 1, 2 and 3. Group 2 test specimens split into two sets, one set for random vibration and one set for sine vibration. One mated pair of small and large connectors for Group 4 EMI testing.

GLENAIR TEST NO.	91906187				91906188			91906189				6220701			
PRODUCT	SERIES 801				SERIES 803			SERIES 804				SERIES 805			
	TEST GROUP				TEST GROUP			TEST GROUP				TEST GROUP			
PART NUMBER	1	2	3	4	1	2	3	1	2	3	4	1	2	3	4
801-008-16M6-7SA	2	2	2	1											
801-009-07M6-7PA	2	2	2	1											
801-008-16M9-19PA	2	2	2												
801-009-07M9-19SA	2	2	2												
801-008-16M16-55SA	2	2	2	1											
801-009-07M16-55PA	2	2	2	1											
803-002-06M6-7SN					2	2	2								
803-004-07M6-7PN					2	2	2								
803-002-06M9-19PN					2	2	2								
803-004-07M9-19SN					2	2	2								
803-002-06M14-55SN					2	2	2								
803-004-07M14-55PN					2	2	2								
804-002-06M6-7S								2	2	2	1				
804-004-07M6-7P								2	2	2	1				
804-002-06M9-19P								2	2	2					
804-004-07M9-19S								2	2	2					
804-002-06M14-55S								2	2	2	1				
804-004-07M14-55P								2	2	2	1				
805-001-16M8-7PA												2	2	2	
805-003-07M8-7SA												2	2	2	
805-001-16M11-19PA												2	2	2	
805-003-07M11-19SA												2	2	2	
805-001-16M18-55PA												2	2	2	
805-003-07M18-55SA												2	2	2	
805-001-16M9-10SA															2
805-003-07M9-10PA															2

1.6 Test Specimen Preparation

All connectors were terminated with M22759/11-24 wire. Group 3 specimens were potted with epoxy prior to immersion testing per MIL-STD-810, method 512.4.

1.7 Inspection Conditions

All tests were performed with the test specimens at standard laboratory conditions as defined below unless otherwise required by the procedure.

1. Temperature between 15° C. and 35° C.
2. Relative humidity between 20% and 90%.
3. Barometric pressure between 700 mm and 800 mm of mercury absolute.

1.8 Qualification Test Sequence

GLENAIR TEST NO.	91906187				91906188			91906189				6220701			
PRODUCT	SERIES 801				SERIES 803			SERIES 804				SERIES 805			
	TEST GROUP				TEST GROUP			TEST GROUP				TEST GROUP			
	1	2	3	4	1	2	3	1	2	3	4	1	2	3	4
TEST	TEST SEQUENCE				TEST SEQUENCE			TEST SEQUENCE				TEST SEQUENCE			
Visual and mechanical examination	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Magnetic permeability	2											2			
Altitude immersion	3														
Insulation resistance at ambient temp.					2	3		4	5			5	3,13		
Dielectric withstanding voltage, sea level					3	4		5	6			6	4,14		
Insert retention	4											7			
Durability (500 cycles)	5	7						6	7					2	
Durability (50 cycles)						5									
Shell-to-shell conductivity	6, 8				4,6			2,7,10	2,8,13			8,11		4,6	
Mating/Unmating Force								3,8,11	3,9,14						
Salt spray	7				5			9				9			
Electrical engagement	9				7			12				12			
Contact retention		2											2		
Altitude-low temperature		3													
Thermal cycling		4				2			4			3	5		
Insulation resistance at elevated temperature		5											7		
Dielectric withstanding voltage at altitude		6											8		
Random vibration		8				6			11				9		
Sine vibration		9				7			10				10		
Shock		10				8			12				11		
Humidity		11				9			15				12		
Sand and Dust			2				1			2					
Immersion			3				2			3					
Coupling torque												4,10	6	5	
Spring finger force														3	
EMI shielding effectiveness				2							2				2
Final examination	10	12	4		8	10	3	13	16	4		13	15	7	

2 SUMMARY OF QUALIFICATION TESTING

2.1 Initial Examination of Product

All specimens submitted for testing were representative of standard production lots. All specimens were accepted by Glenair Quality Assurance prior to submittal to testing. Testing agencies visually examined specimens for mechanical damage, workmanship and markings.

2.2 Magnetic Permeability

2.2.1 Test Method

EIA-364-54A.

2.2.2 Requirement

A permeability indicator with a 2 Mu pellet shall not deflect when applied to the test specimens

2.2.3 Results

All specimens met the requirement.

2.3 Altitude Immersion

2.3.1 Test Method

EIA-364-03B.

2.3.2 Requirement

Specimens shall meet DWV and IR specifications when subjected to immersion at a simulated altitude of 40,000 feet.

2.3.3 Results

Four of 12 insulation resistance measurements indicated a short. Eight of 15 DWV measurements did not meet 500 VAC. Specimens were removed from test and replaced. The replacement specimens met the requirement with all insulation resistance readings greater than 1000 megohm.

2.4 Insulation Resistance at Ambient Temperature

2.4.1 Test Method

EIA-364-21.

2.4.2 Requirement

5000 megohms minimum insulation resistance.

2.4.3 Results

All specimens tested met the requirement.

2.5 Dielectric Withstanding Voltage at Sea Level

2.5.1 Test Method

EIA-364-20

2.5.2 Requirement

500 VAC

2.5.3 Results
No evidence of breakdown or flashover

2.6 Insert Retention

2.6.1 Test Method
EIA-364-35B. An axial load was applied to the unmated connector inserts in both directions. The rate of application was approximately 10 psi/second. The peak load was maintained for a period of 5-10 seconds.

SERIES 801 PART NUMBER	SERIES 805 PART NUMBER	Axial Load (lbs.)
801-008-16M6-7SA	805-001-16M8-7PA	25
801-009-07M6-7PA	805-003-07M8-7SA	25
801-008-16M9-19PA	805-001-16M11-19PA	30
801-009-07M9-19SA	805-003-07M11-19SA	30
801-008-16M16-55SA	805-001-16M18-55PA	50
801-009-07M16-55PA	805-003-07M18-55SA	50

2.6.2 Results
There was no visible evidence of cracking, breaking, separation from shell or loosening of parts. The inserts were retained in their proper location.

2.7 Durability (500 Cycles)

2.7.1 Test Method
EIA-364-09C.
Series 801, Series 804 and Series 805 connectors were subjected to 500 cycles of mating and unmating at a maximum rate of 300 cycles per hour. The test specimens were subjected to a visual examination.

2.7.2 Results
There was no evidence of physical degradation noted.

2.8 Durability (50 Cycles)

2.8.1 Test Method
EIA-364-09C.
Series 803 connectors were subjected to 50 cycles of mating and unmating at a maximum rate of 300 cycles per hour. The test specimens were subjected to a visual examination at 25 and 50 cycles.

2.8.2 Results
There was no evidence of physical degradation noted.

2.9 Shell-to-Shell Conductivity

2.9.1 Test Method

EIA-364-83. Open circuit test voltage of 1.5 VDC (maximum) was applied across the mated connector. The test current was 1.0 A. The voltage drop was measured from a point on the rear accessory thread on the plug to the point adjacent to the o-ring on the mounting flange of the receptacle using a .05" minimum spherical end radius test probe.

2.9.2 Results

PLUG	MATING RECEPTACLE	INITIAL VOLTAGE DROP (Mv)	VOLTAGE DROP (Mv) AFTER MATING /UNMATING	VOLTAGE DROP FOLLOWING SALT SPRAY	TEST REPORT NUMBER
801-008-16M6-7SA	801-009-07M6-7PA	13.7(1)		16.4	91906187
801-008-16M6-7SA	801-009-07M6-7PA	6.7		21.7	91906187
801-008-16M9-19PA	801-009-07M9-19SA	7.9		9.8	91906187
801-008-16M9-19PA	801-009-07M9-19SA	6.1		4.8	91906187
801-008-16M16-55SA	801-009-07M16-55PA	52.2(1)		5.6	91906187
801-008-16M16-55SA	801-009-07M16-55PA	31.3(1)		4.3	91906187
803-002-06M6-7SN	803-004-07M6-7PN	20.50		21.53	91906188
803-002-06M6-7SN	803-004-07M6-7PN	15.41		44.55	91906188
803-002-06M9-19PN	803-004-07M9-19SN	16.48		10.98	91906188
803-002-06M9-19PN	803-004-07M9-19SN	20.34		7.17	91906188
803-002-06M16-55SN	803-004-07M14-55PN	33.60		9.60	91906188
803-002-06M16-55SN	803-004-07M14-55PN	30.59		59.20	91906188
804-002-06M6-7S	804-004-07M6-7P	11	1.2	1.8	91906189
804-002-06M6-7S	804-004-07M6-7P	12	1.5	2.1	91906189
804-002-06M9-19P	804-004-07M9-19S	5	1.1	1.1	91906189
804-002-06M9-19P	804-004-07M9-19S	13	1.0	1.2	91906189
804-002-06M14-55S	804-004-07M14-55P	13	1.1	1.4	91906189
804-002-06M14-55S	804-004-07M14-55P	8	1.6	1.7	91906189
805-001-16M8-7PN	805-003-07M8-7SA	4.6		4.6	6220701
805-001-16M8-7PN	805-003-07M8-7SA	7.2		7.2	6220701
805-001-16M11-19PA	805-003-07M11-19SA	12.1		3.7	6220701
805-001-16M11-19PA	805-003-07M11-19SA	11.2		3.8	6220701
805-001-16M18-55PA	805-003-07M18-55SA	2.4		0.77	6220701
805-001-16M18-55PA	805-003-07M18-55SA	3.6		1.23	6220701

(1) These readings are assumed to be inaccurate. Following completion of the test, the samples were re-checked at Glenair using a micro-ohmmeter and all were found to be under 10 milliohms following salt spray. Other in-house tests have repeatedly shown Series 801 connectors to be under 10 milliohms resistance.

PLUG	MATING RECEPTACLE	INITIAL VOLTAGE DROP (Mv)	VOLTAGE DROP AFTER 500 CYCLES DURABILITY	VOLTAGE DROP FOLLOWING SHOCK AND VIBRATION	TEST REPORT NUMBER
804-002-06M6-7S	804-004-07M6-7P	11	1.9	1.3	91906189
804-002-06M6-7S	804-004-07M6-7P	12	1.7	2.0	91906189
804-002-06M9-19P	804-004-07M9-19S	5	1.0	1.0	91906189
804-002-06M9-19P	804-004-07M9-19S	13	0.8	1.9	91906189
804-002-06M14-55S	804-004-07M14-55P	13	0.9	0.7	91906189
804-002-06M14-55S	804-004-07M14-55P	8	1.1	1.7	91906189

2.10 Mating/Unmating Force

2.10.1 Method

EIA-364-13B. The connector halves were mounted in a holding fixture and carefully aligned in all three planes.The plug and receptacle of each conector pair was mated/unmated at an approximate rate of 50 mm/minute.

2.10.2 Results

PLUG	MATING RECEPTACLE	INITIAL MATING FORCE IN POUNDS	INITIAL UNMATING FORCE IN POUNDS	TEST REPORT NUMBER
804-002-06M6-7S	804-004-07M6-7P	6.0	8.0	91906189
804-002-06M6-7S	804-004-07M6-7P	6.5	8.0	91906189
804-002-06M9-19P	804-004-07M9-19S	9.0	15.0	91906189
804-002-06M9-19P	804-004-07M9-19S	11.5	16.0	91906189
804-002-06M14-55S	804-004-07M14-55P	22.5	20.5	91906189
804-002-06M14-55S	804-004-07M14-55P	21.0	21.5	91906189
		MATING FORCE AFTER 500 CYCLES	UNMATING FORCE AFTER 500 CYCLES	
804-002-06M6-7S	804-004-07M6-7P	6.8	8.8	91906189
804-002-06M6-7S	804-004-07M6-7P	5.6	8.4	91906189
804-002-06M9-19P	804-004-07M9-19S	9.6	16.0	91906189
804-002-06M9-19P	804-004-07M9-19S	11.2	14.8	91906189
804-002-06M14-55S	804-004-07M14-55P	26.5	24.5	91906189
804-002-06M14-55S	804-004-07M14-55P	24.5	28.0	91906189
		MATING FORCE AFTER 500 CYCLES AND SHOCK/VIBRATION	UNMATING FORCE AFTER 500 CYCLES AND SHOCK/VIBRATION	
804-002-06M6-7S	804-004-07M6-7P	5.0	9.5	91906189
804-002-06M6-7S	804-004-07M6-7P	6.0	11.0	91906189
804-002-06M9-19P	804-004-07M9-19S	9.5	15.5	91906189
804-002-06M9-19P	804-004-07M9-19S	13.0	22.0	91906189
804-002-06M14-55S	804-004-07M14-55P	20.5	25.0	91906189
804-002-06M14-55S	804-004-07M14-55P	20.5	22.0	91906189

2.11 Salt Spray

2.11.1 Method

EIA-364-26B. The unmated connectors were subjected to 48 hours salt fog. Connectors were placed horizontally in the salt spray chamber, on a plastic bar with the mating faces pointing downward. The ends of the wires were routed outside the chamber. Following 48 hours exposure at +35° C to an atmosphere of 5% NaCl and 95% deionized water, specimens were removed from the test chamber, thoroughly rinsed with deionized water and allowed to dry at ambient conditions.

2.11.2 Results

Visual examination showed no visible evidence of physical damage.

2.12 Electrical Engagement

2.12.1 Method

MIL-DTL-38999K, Paragraph 4.5.14. The connectors were wired to provide a complete series circuit through all contacts of the mated connectors. The test sample was slowly mated until the first indication of a completed circuit through the contacts was observed with an ohmmeter. The mating operation was stopped and the overall length was measured from solid reference points on the connector halves. The mating process was then resumed until the connectors were completely mated. The overall length was again measured from the same reference points. The electrical engagement was then calculated by subtracting the fully mated overall length from the overall length when the completed circuit was first energized.

2.12.2 Results

PLUG	MATING RECEPTACLE	CALCULATED ELECTRICAL ENGAGEMENT (INCH)	TEST REPORT NUMBER
801-008-16M6-7SA	801-009-07M6-7PA	.098	91906187
801-008-16M6-7SA	801-009-07M6-7PA	.097	91906187
801-008-16M9-19PA	801-009-07M9-19SA	.097	91906187
801-008-16M9-19PA	801-009-07M9-19SA	.091	91906187
801-008-16M16-55SA	801-009-07M16-55PA	.074	91906187
801-008-16M16-55SA	801-009-07M16-55PA	.065	91906187
803-002-06M6-7SN	803-004-07M6-7PN	.074	91906188
803-002-06M6-7SN	803-004-07M6-7PN	.066	91906188
803-002-06M9-19PN	803-004-07M9-19SN	.041	91906188
803-002-06M9-19PN	803-004-07M9-19SN	.049	91906188
803-002-06M16-55SN	803-004-07M14-55PN	.053	91906188
803-002-06M16-55SN	803-004-07M14-55PN	.044	91906188
804-002-06M6-7S	804-004-07M6-7P	.095	91906189
804-002-06M6-7S	804-004-07M6-7P	.096	91906189
804-002-06M9-19P	804-004-07M9-19S	.097	91906189
804-002-06M9-19P	804-004-07M9-19S	.094	91906189
804-002-06M14-55S	804-004-07M14-55P	.092	91906189
804-002-06M14-55S	804-004-07M14-55P	.093	91906189
805-001-16M8-7PN	805-003-07M8-7SA	.076	6220701
805-001-16M8-7PN	805-003-07M8-7SA	.069	6220701
805-001-16M11-19PA	805-003-07M11-19SA	.061	6220701
805-001-16M11-19PA	805-003-07M11-19SA	.079	6220701
805-001-16M18-55PA	805-003-07M18-55SA	.062	6220701
805-001-16M18-55PA	805-003-07M18-55SA	.071	6220701

2.13 Contact Retention

2.13.1 Method

EIA-364-29B. An axial load of 6.0 pounds was applied to the mating end of the contact under test. 20%, but not less than 3, of the contacts were tested.

2.13.2 Results

PRODUCT	CONTACT ARRANGEMENT	TOTAL NUMBER OF CONTACTS TESTED	MINIMUM DISPLACEMENT	MAXIMUM DISPLACE MENT	AVERAGE
SERIES 801	7 CONTACTS	12	.002	.008	.005
SERIES 801	19 CONTACTS	16	.000	.008	.003
SERIES 801	55 CONTACTS	44	.000	.007	.004
SERIES 805	7 CONTACTS	12	.001	.003	.002
SERIES 805	19 CONTACTS	16	.001	.007	.003
SERIES 805	55 CONTACTS	44	.001	.008	.003

2.14 Altitude-Low Temperature

2.14.1 Method

EIA-364-105. Mated connectors were wired in series and placed in a temperature/altitude chamber. The chamber temperature was increased to 50° C. The test samples were conditioned at +50° C for 8 hours. The chamber temperature was reduced to -65° C and stabilized. The chamber pressure was reduced to simulate an altitude of 40,000 feet (2.72 PSIA). The test specimens were subjected to a one hour dwell. Upon completion of the 1 hour dwell, a voltage of 100 VAC (rms) 60 Hz was applied between the series circuit and the connector shell, for a period of 1 minute. The chamber was returned to ambient temperature and pressure. Samples were removed and visually examined.

2.14.2 Results

There was no evidence of breakdown during the voltage application. There was no visible evidence of physical damage noted.

2.15 Thermal Cycling

2.15.1 Method

EIA-364-32. The low temperature chamber was pre-conditioned and stabilized at -65° C. The high temperature chamber was pre-conditioned and stabilized at +150° C. Mated connectors were placed in the cold temperature chamber and subjected to a 60 minute dwell. Specimens were automatically transferred to the high temperature chamber within a maximum of 2 minutes. The specimens were subjected to a 60 minute dwell at +150° C. The specimens were automatically transferred to the low temperature chamber within a maximum period of 2 minutes. This cycle was repeated four additional times for a total of five cycles. The specimens were removed from the chamber and visually examined.

2.15.2 Results

Visual examination did not reveal any evidence of physical damage. Specimens successfully completed subsequent shock and vibration and humidity testing.

PLUG	MATING RECEPTACLE	NUMBER OF THERMAL CYCLES	RESULTS	TEST REPORT NUMBER	GROUP NUMBER
801-008-16M6-7SA	801-009-07M6-7PA	5	PASS	91906187	2
801-008-16M9-19PA	801-009-07M9-19SA	5	PASS	91906187	2
801-008-16M16-55SA	801-009-07M16-55PA	5	PASS	91906187	2
803-002-06M6-7SN	803-004-07M6-7PN	5	PASS	91906188	2
803-002-06M9-19PN	803-004-07M9-19SN	5	PASS	91906188	2
803-002-06M16-55SN	803-004-07M14-55PN	5	PASS	91906188	2
804-002-06M6-7S	804-004-07M6-7P	5	PASS	91906189	2
804-002-06M9-19P	804-004-07M9-19S	5	PASS	91906189	2
804-002-06M14-55S	804-004-07M14-55P	5	PASS	91906189	2
805-001-16M8-7PA	805-003-07M8-7SA	5	PASS	6220701	1
805-001-16M11-19PA	805-003-07M11-19SA	5	PASS	6220701	1
805-001-16M18-55PA	805-003-07M18-55SA	5	PASS	6220701	1

2.16 Insulation Resistance at Elevated Temperature

2.16.1 Method

EIA-364-21. Mated test specimens were placed in a temperature chamber. The chamber temperature was increased to +150° C and stabilized. Resistance readings were recorded.

2.16.2 Results

PLUG	MATING RECEPTACLE	NO. OF CONTACTS TESTED	MIN-MAX INS RESIST. GΩ	TEST REPORT NO.
801-008-16M6-7SA	801-009-07M6-7PA	6	20-700	91906187
801-008-16M6-7SA	801-009-07M6-7PA	6	5-30	91906187
801-008-16M9-19PA	801-009-07M9-19SA	6	20-3000	91906187
801-008-16M9-19PA	801-009-07M9-19SA	6	20-150	91906187
801-008-16M16-55SA	801-009-07M16-55PA	6	10-500	91906187
801-008-16M16-55SA	801-009-07M16-55PA	6	15-100	91906187
805-001-16M8-7PN	805-003-07M8-7SA	6	5-1000	6220701
805-001-16M8-7PN	805-003-07M8-7SA	6	15-2000	6220701
805-001-16M11-19PA	805-003-07M11-19SA	6	80-8000	6220701
805-001-16M11-19PA	805-003-07M11-19SA	6	20-4000	6220701
805-001-16M18-55PA	805-003-07M18-55SA	6	20-4000	6220701
805-001-16M18-55PA	805-003-07M18-55SA	6	20-5000	6220701

2.17 Dielectric Withstanding Voltage at Altitude

2.17.1 Method

EIA-364-20C. The test specimens were placed in an altitude chamber. The chamber pressure was reduced to simulate an altitude of 40,000 feet (2.72 PSIA) and stabilized. A voltage of 100 VAC (rms) 60 Hz was applied between adjacent contacts and the connector shell. The voltage was applied for 2 seconds minimum.

2.17.2 Results
No breakdown or flashover.

2.18 Random Vibration, Group 2

2.18.1 Method
EIA-364-28 Condition V Letter I, 37.8 g's, 4 hours sequentially in each of three axes, ambient temperature. Group 2 specimens were divided into two sets, one mated pair of each size for random vibration and one pair for sine vibration.

2.18.2 Results
No discontinuities were detected. Following vibration testing, visual inspection did not reveal evidence of physical damage.

2.19 Sine Vibration, Group 2

2.19.1 Method
MIL-DTL-38999K,Paragraph 4.5.22.2.1, modified.

Frequency	Level
10 – 100 Hz	0.06 inch double amplitude
100 – 2000 Hz	30 g's peak

logarithmic sweep, 10 Hz to 2000 Hz, 10 minutes/sweep
Ambient temperature
24 sweeps (4 hours) in each of three axes

2.19.2 Results
No discontinuities were detected. Following vibration testing, visual inspection did not reveal evidence of physical damage.

2.19.3 Shock, Group 2

2.19.4 Method
EIA-364-27B, Condition D. 300 g's peak, 3 millisecond duration, halfsine pulse. 3 shocks in the positive direction, 3 shocks in the negative direction, repeated in each of three axes for a total of 18 shocks per specimen.

2.19.5 Results
No discontinuities were detected. Following vibration testing, visual inspection did not reveal evidence of physical damage.

2.19.6 Humidity, Group 2

2.19.7 Method
EIA-364-31B, Method IV
Test group 2 mated specimens were mounted in a horizontal position in a temperature/ humidity chamber. The wire ends were routed out of the chamber through a port. He test samples were subjected to 24 hours drying at +50° C, humidity uncontrolled. Specimens were subjected to five 24 hour cycles of varying temperature and humidity. Following completion of step 7a of the final cycle, insulation resistance and DWV measurements were performed.

2.19.8 Results
All insulation resistance measurements exceeded the 100 megohn requirement. All DWV tests showed no evidence of breakdown or flashover at 500 VAC (rms) 60 Hz.

2.20 Sand and Dust

2.20.1 Method
MIL-STD-810F, Method 510.4

2.20.2 Results
Following exposure to sand and dust, specimens successfully passed immersion testing and final examination.

2.21 Immersion

2.21.1 Method
MIL-STD-810F, Method 512.4. Specimens were backpotted with epoxy to seal the wires. Mated specimens at ambient temperature were immersed in 1 meter of fresh water, removed from immersion and allowed to dry. Insulation resistance measurements and DWV measurements were made to verify that moisture had not penetrated into the connectors.

2.21.2 Results
Series 801 and 804 specimens met electrical requirements following immersion. Specimens passed 200 megohms insulation resistance and 500 VAC DWV.
Series 803 specimens failed to prevent the intrusion of water.

2.21.3 Coupling Torque, Series 805

2.21.3.1 Coupling Torque, Initial

PLUG	MATING RECEPTACLE	COUPLING FORCE (LB.-IN.)	UNCOUPLING FORCE (LB.-IN.)	TEST REPORT NO.
805-001-16M8-7PN	805-003-07M8-7SA	4.0	2.5	6220701
805-001-16M8-7PN	805-003-07M8-7SA	4.5	3.0	6220701
805-001-16M11-19PA	805-003-07M11-19SA	8.5	3.5	6220701
805-001-16M11-19PA	805-003-07M11-19SA	8.0	3.0	6220701
805-001-16M18-55PA	805-003-07M18-55SA	22.0	11.0	6220701
805-001-16M18-55PA	805-003-07M18-55SA	24.0	13.0	6220701

2.21.3.2 Coupling Torque, After Salt Spray

PLUG	MATING RECEPTACLE	COUPLING FORCE (LB.-IN.)	UNCOUPLING FORCE (LB.-IN.)	TEST REPORT NO.
805-001-16M8-7PN	805-003-07M8-7SA	4.5	4.5	6220701
805-001-16M8-7PN	805-003-07M8-7SA	5.0	6.0	6220701
805-001-16M11-19PA	805-003-07M11-19SA	6.0	7.5	6220701
805-001-16M11-19PA	805-003-07M11-19SA	8.5	7.5	6220701
805-001-16M18-55PA	805-003-07M18-55SA	26.0	13.0	6220701
805-001-16M18-55PA	805-003-07M18-55SA	25.0	14.0	6220701

2.21.3.3 Coupling Torque, After 500 Cycles Mating

PLUG	MATING RECEPTACLE	COUPLING FORCE (LB.-IN.)	UNCOUPLING FORCE (LB.-IN.)	TEST REPORT NO.
805-001-16M8-7PN	805-003-07M8-7SA	3.0	2.0	6220701
805-001-16M8-7PN	805-003-07M8-7SA	4.0	3.0	6220701
805-001-16M11-19PA	805-003-07M11-19SA	9.0	5.0	6220701
805-001-16M11-19PA	805-003-07M11-19SA	8.0	4.0	6220701
805-001-16M18-55PA	805-003-07M18-55SA	18.5	15.0	6220701
805-001-16M18-55PA	805-003-07M18-55SA	20.5	15.5	6220701

2.22 Shell Spring Finger Force

PLUG	MATING RECEPTACLE	INITIAL SPRING FORCE (POUNDS)	10^{TH} CYCLE SPRING FORCE (POUNDS)	TEST REPORT NO.
805-001-16M8-7PN	805-003-07M8-7SA	3.4	2.2	6220701
805-001-16M8-7PN	805-003-07M8-7SA	2.7	2.5	6220701
805-001-16M11-19PA	805-003-07M11-19SA	4.0	2.6	6220701
805-001-16M11-19PA	805-003-07M11-19SA	4.2	2.7	6220701
805-001-16M18-55PA	805-003-07M18-55SA	6.9	4.0	6220701
805-001-16M18-55PA	805-003-07M18-55SA	6.5	3.4	6220701

2.23 EMI Shielding Effectiveness

2.23.1 EMI Shielding Effectiveness: High Frequency (1GHz-18GHz.
Testing Agency: National Technical Institute (NTS)
Test report Number: 679-4971-1
Date: September 20, 2006

2.23.1.4 Method
IEEE-299, modified. A transmitter and receiver were set up in separate chambers with an opening between the chambers. A reference measurement was taken in logarithmic units and recorded as RXref. A feedthrough panel was installed over the opening between the chambers and the connector was mounted per Figure 1. Power was recorded in logarithmic units as RXdut. Shielding effectiveness (SE) = RXref – Rxdut.

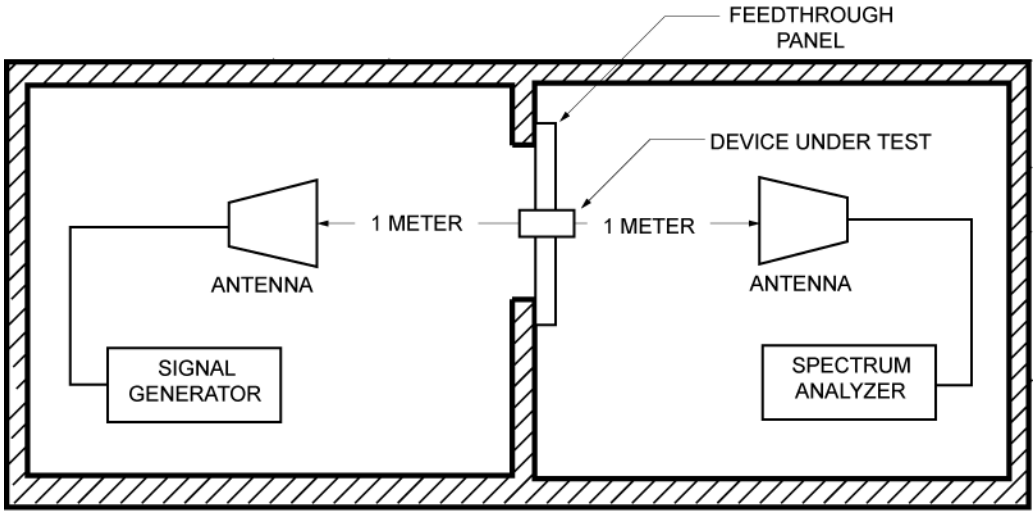


FIGURE 1
SHIELDING EFFECTIVENESS TEST SETUP

2.23.1.5 Test Specimens for Shielding Effectiveness

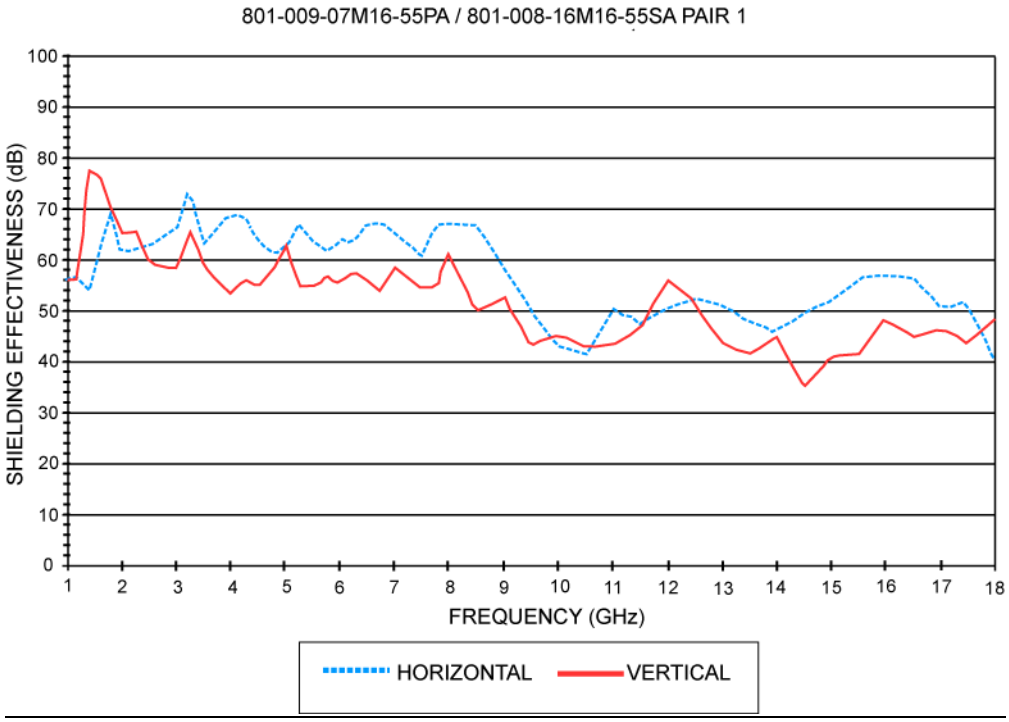
PLUG	MATING RECEPTACLE	QUANTITY
801-008-16M6-7SA	801-009-07M6-7PA	2 PAIRS
801-008-16M16-55SA	801-009-07M16-55PA	2 PAIRS
804-002-06M6-7S	804-004-07M6-7P	1 PAIR
804-002-06M14-55S	804-004-07M14-55P	1 PAIR
805-001-16M9-10SA	805-003-07M9-10PA	2 PAIRS

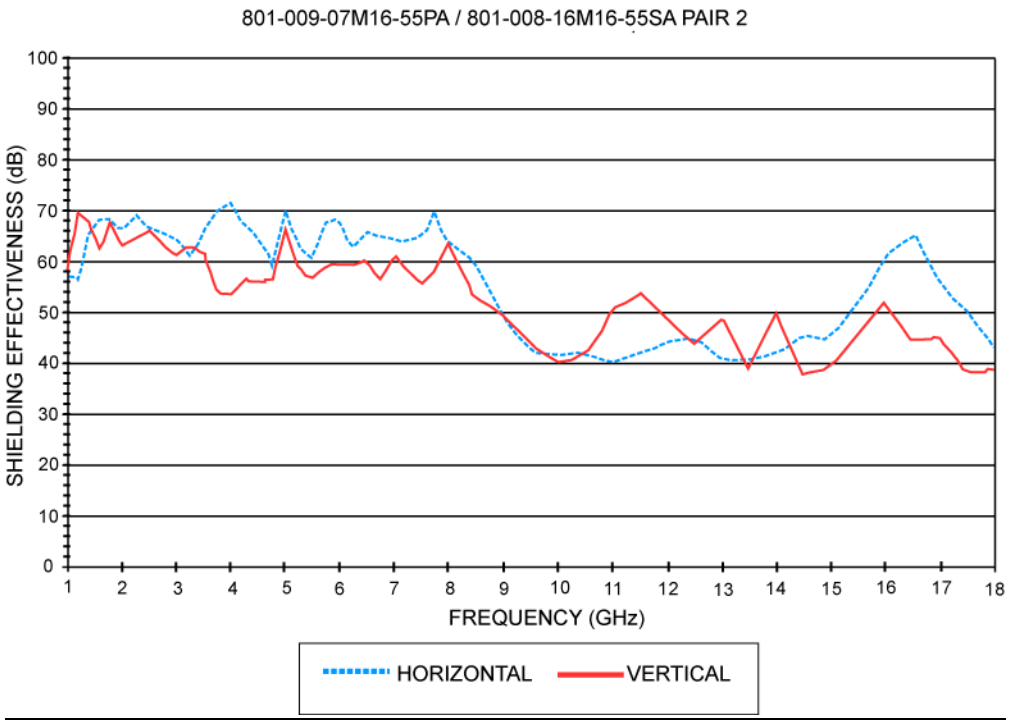
2.23.1.6 Description of Test Apparatus

HP Signal Generator Model 8673C 50 MHz- 18.6 GHz
Agilent Spectrum Analyzer Model E446A 3Hz- 44 GHz
EMCO Double Ridge Guided Horn Antenna Model 3115 1 GHz – 18 GHz
Eaton Double Ridged Guide Antenna Model 96001 1 GHz – 18 GHz
HP Microwave Amplifier Model 8349B 1 GHz- 20 GHz

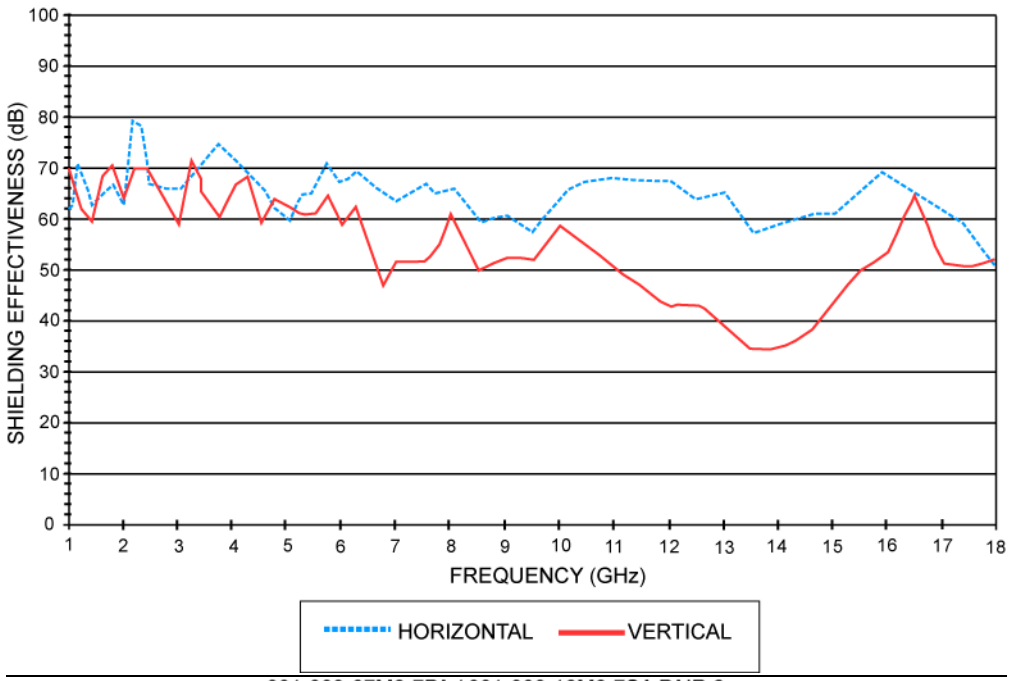
2.23.1.7 Results

2.23.1.7.1 Results for Series 801

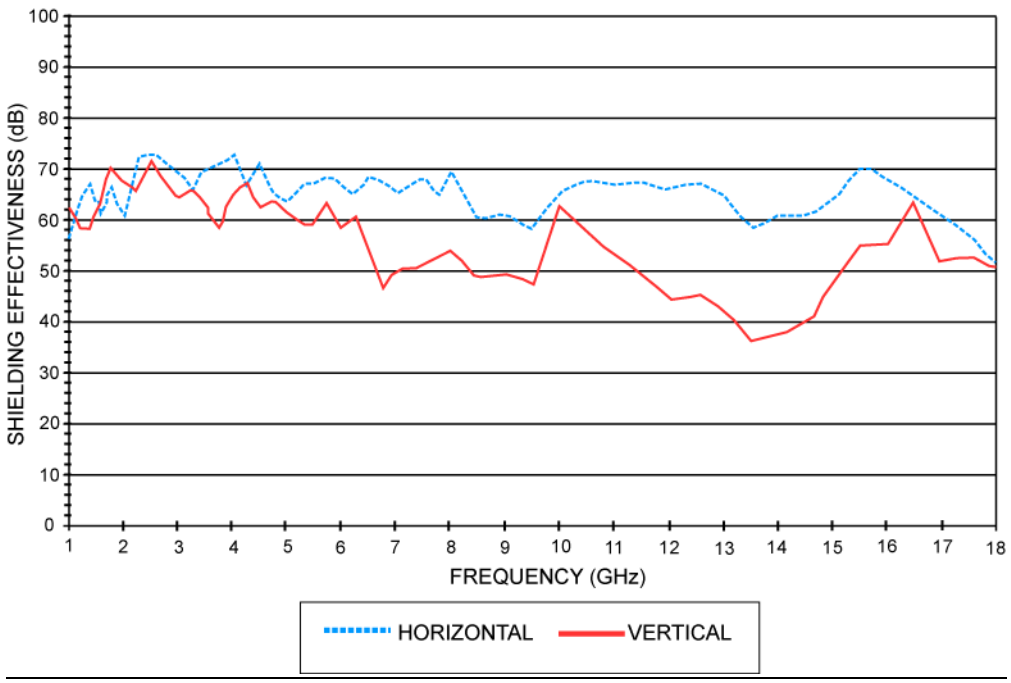




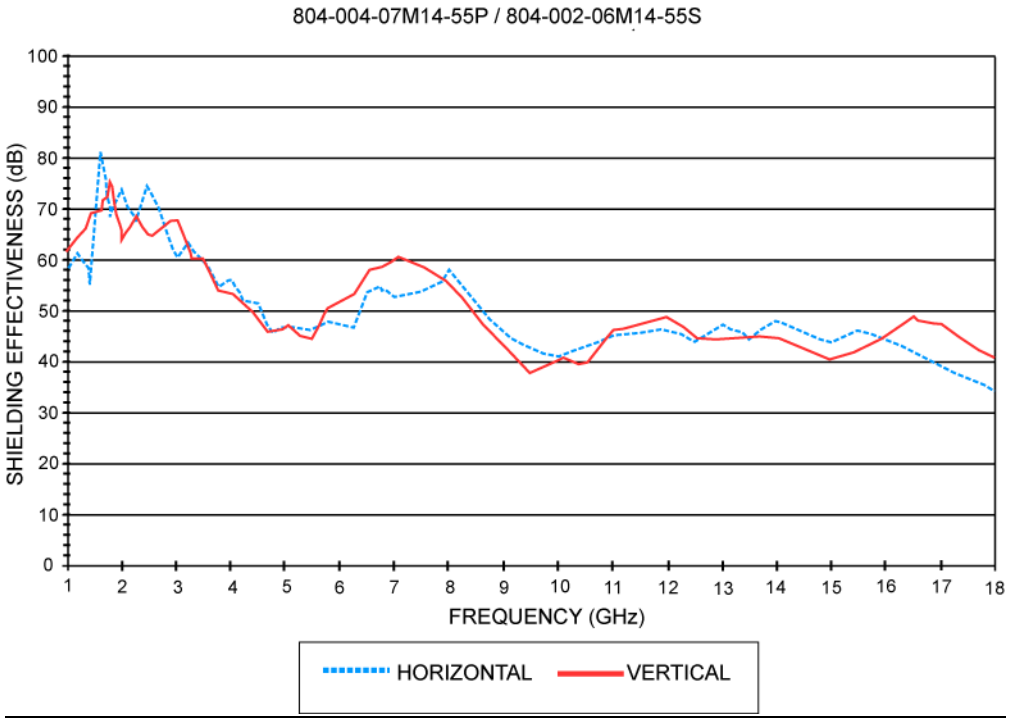
801-009-07M6-7PA / 801-008-16M6-7SA PAIR 1

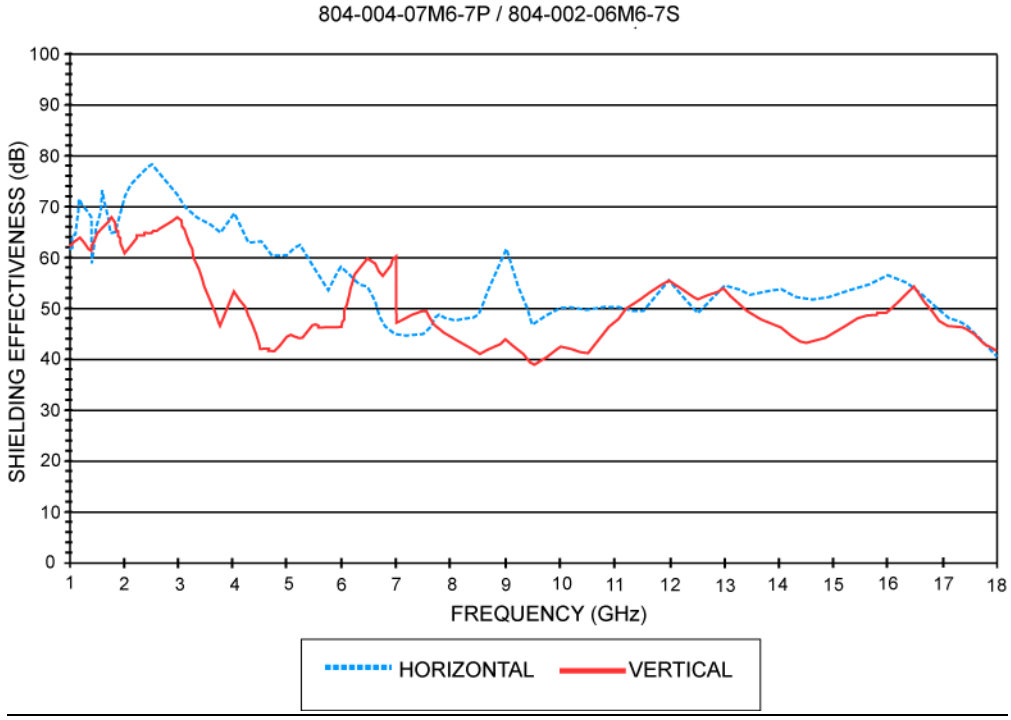


801-009-07M6-7PA / 801-008-16M6-7SA PAIR 2

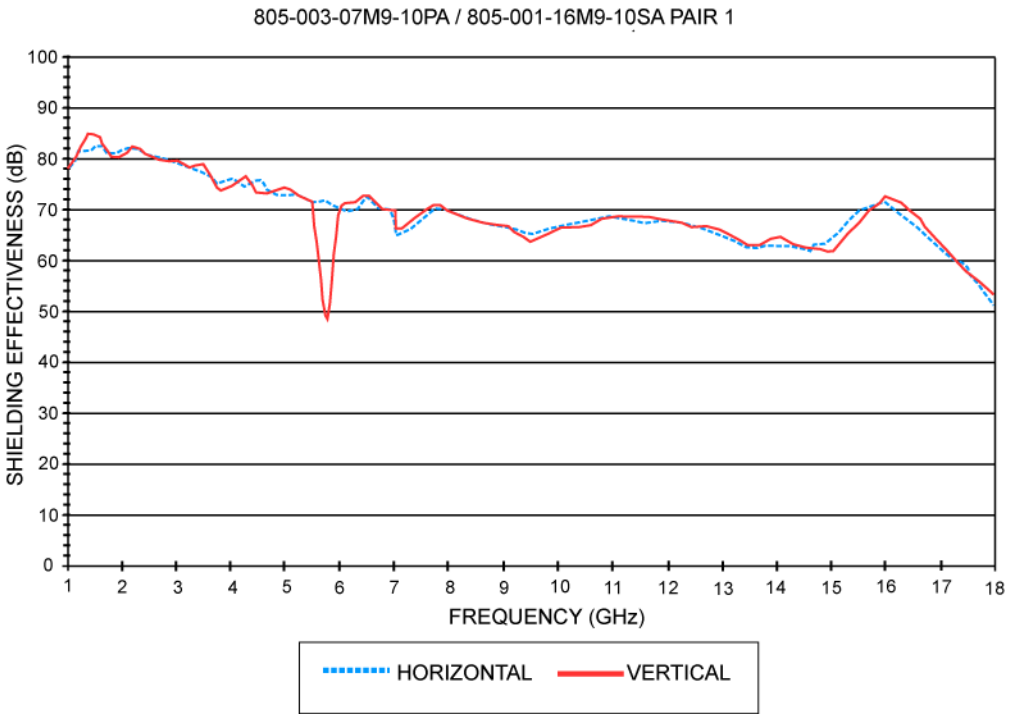


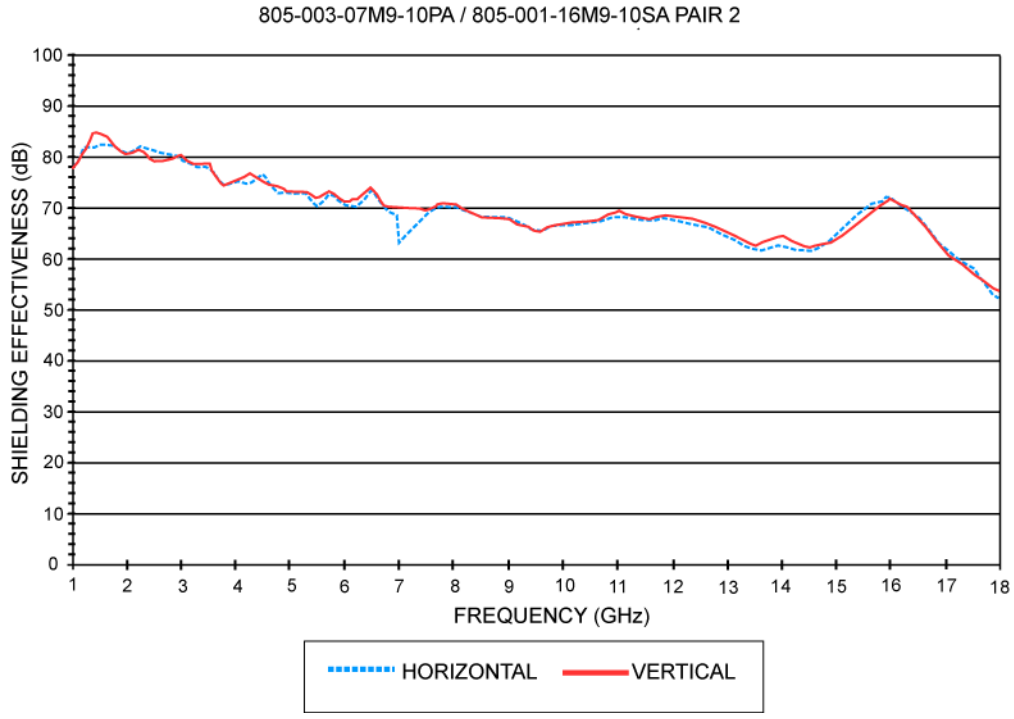
2.23.1.7.2 Results for Series 804





2.23.1.7.3 Results for Series 805





2.23.1.8 Final Examination

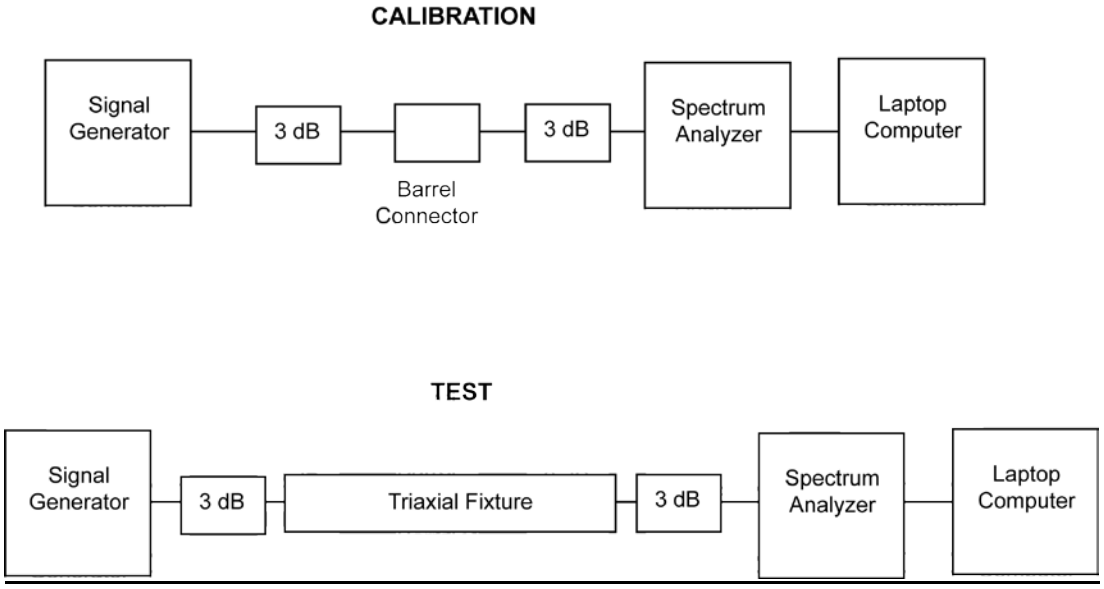
2.23.1.8.1 Method
MIL-DTL-38999K, Paragraph 4.5.1. Specimens were visually examined for mechanical damage, workmanship and markings.

2.23.1.8.2 Results
No visible evidence of damage was noted. No evidence of poor workmanship was noted. Markings were clear and legible.

2.23.2 EMI Shielding Effectiveness: Low Frequency (100 MHz-1000MHz)
Testing Agency: DNB Engineering, Fullerton, CA
Test report Number: 91906187 (TR055787/70095)
Date: January 15, 2007

2.23.2.1 Requirement: Shielding effectiveness testing in accordance with MIL-DTL-38999K, Paragraph 4.5.27.1.

2.23.2.2 Test Method
A triaxial RFI leakage test fixture per MIL-DTL-38999K, Figure 26, was used to test mated pairs of Series 80 connectors.



2.23.2.3 Test Specimens

Pair Number	PLUG	MATING RECEPTACLE	QUANTITY
CP1	804-002-06M6-M14-55S	804-004-07M14-55P	1 PAIR
CP2	801-008-16M16-55SA	801-009-07M16-55PA	1 PAIR
CP3A,B	805-002-16M11-19PA	805-004-07M11-19SA	2 PAIR
CP4A,B	805-002-16M8-7SA	805-004-07M8-7PA	2 PAIR
CP5A,B	801-008-16M6-7SA	801-009-07M6-7PA	2 PAIR
CP6A,B	804-002-06M6-7S	804-004-07M6-7P	2 PAIR

2.23.2.4 Description of Test Apparatus

Marconi Signal Generator Model 2024
Agilent Spectrum Analyzer Model E4402B
DNB Triaxial Fixture Model TF001
Midwest Microwave Attenuator, 3 dB
Armored Workhorse Coaxial Cable #11832 and 11830

2.23.2.5 EMI Test Results

		dB Shielding Effectiveness Frequency in MHz					
SERIES	SAMPLE	100	200	300	400	800	1000
804 55 PIN	CP1	92.8	90.1	94.7	94.5	92.7	92.4
801 55 PIN	CP2	92.2	89.0	93.8	88.4	85.9	86.5
805 19 PIN	CP3A	81.7	77.6	78.4	78.7	77.1	61.4
805 19 PIN	CP3B	82.3	76.1	77.0	77.8	75.9	61.3
805 7 PIN	CP4A	84.9	78.4	81.9	91.1	82.5	76.5
805 7 PIN	CP4B	86.0	83.1	84.9	82.7	84.4	77.8
801 7 PIN	CP5A	83.8	78.2	80.3	77.7	79.1	74.3
801 7 PIN	CP5B	82.7	76.9	79.1	71.6	75.0	70.8
804 7 PIN	CP6A	83.8	77.6	79.6	78.7	78.8	71.4
804 7 PIN	CP6B	82.8	77.7	79.9	78.3	78.6	73.4

3 SUMMARY OF PRODUCT EVALUATION TESTS

3.1 Outgassing Testing on Fluorosilicone Rubber Used on Series 80 Connectors

Testing Agency: NuSil Technology, Carpenteria, California
Date: October 17 to October 27, 2003
Report Number 52558

3.1.1 Method
ASTM-E595.
Three tests:
1. "AS IS" parts pulled from stock in their original state.
2. "BAKED" parts were subjected to 8 hours bakeout at 400° F.
3. "THERMAL VACUUM OUTGASSED". Parts were subjected to 24 hours vacuum bakeout at +125° C.

3.1.2 Test Specimens
37 pin grommet, P/N 89N-25004-12-37

3.1.3 Results

PROCESSING METHOD	TOTAL MASS LOSS TML	PASS/ FAIL	COLLECTED VOLATILE CONDENSIBLE MATERIAL CVCM	PASS/FAIL
NO SPECIAL PROCESSING	0.97%	PASS	0.14	FAIL
8 HOUR BAKE, 400° F	0.10%	PASS	0.03%	PASS
24 HOUR THERMAL VACUUM OUTGAS , 125°C	0.17%	PASS	0.04%	PASS

3.2 Gunfire Vibration Testing On Series 800 "Mighty Mouse" Connectors
Testing Agency: Glenair UK Ltd., Mansfield England
Date: June 17, 2002
Test report number: TR32-0502

3.2.1 Object of Test
To conduct Random and Gunfire Vibration on Series 800 "Mighty Mouse" Connectors to JN1003 (Eurofighter) with reference to MIL-STD-810

3.2.2 Test Specimens
2 each 800-010-07NF6-7PN and mate 800-006-06M6-7SN
2 each 800-009-16NF15-85PN and mate 800-011-07NF15-85SN

3.2.3 Method
MIL-STD-810D Method 514.3 Random Vibration 33 g.'s, one hour in each axis.
MIL-STD-810D Method 519.3 Gunfire Vibration 57 g's

3.2.4 Results
No discontinuities greater than 1 microsecond, no damage or loosening of connectors.

3.3 Breakdown Voltage of Series 800 "Mighty Mouse" connectors at Altitude
Testing Agency: Glenair UK Ltd.
Date: June 12, 2002
Test Report Number TR43-0602

3.3.1 Method

Wired connectors were placed in an altitude chamber and pressurized to 33 millibar (equivalent to 70,000 feet) with the sample in both the mated and unmated condition. DC voltage was increased at approximately 100 V/sec until breakdown occurred, with the current trp set to 0.3 mA.

3.3.2 Test Specimens

800-006-06M5-7SN mated to 800-010-07NF6-7PN

3.3.3 Results

Breakdown occurred at 550, 800, 400, 600, 400 and 450 VDC