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DWG NO.

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
-	INITIAL AN/ALR-67(V)3 RELEASE (ECA 1519)	95/4/29	F.A.
A	RECORD CHANGE CORRECTED PER PCA FINDINGS	96/2/2	F.A.
B	REVISED PER ECA 8786	01/6/5	A. Szamboti
C	REVISED PER ECA 9469	02-4-1	J. Popek
D	REVISED PER ECA 9689	02-4-24	A. Krol
E	REVISED PER ECO EOA 71754 ml	12-2-29	R. Reidenbach

DRAWN G.SYMENSKI	DATE 91/4/19	SENSOR AND ANTENNA SYSTEMS LANSDALE, INC. LANSDALE, PA 19446 CAGE CODE 93346
CHECKED D.EDWARDS	91/10/7	
MECH ENGR S.GROSS	91/10/7	CONTRACT NO. N00019-89-C-0125
ELEC ENGR L.RUBIN	91/10/8	
PROG MGR A.FEINEMAN	91/10/8	

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ANGLES + FRACTIONS + DECIMALS + PART SHALL BE FREE OF BURRS BROKEN EDGES FILLETS R MAX ☒ MAX	1874AS4004	REV LTR																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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1. SCOPE

1.1 Purpose. This drawing delineates the requirements for a EWTNC radio frequency connector. The connector has a nominal impedance of 50 ohms and is designed to operate over the frequency range of DC through 18.5 GHz. The connector will be soldered (MIL-STD-2000) to silver-plated MIL-C-17/133-00008 semi-rigid cable.

2. APPLICABLE DOCUMENTS

2.1 Specifications, standards and handbooks. The following documents of the revision indicated shall form a part of this document to the extent specified herein. Documents listed without revision status shall be those in effect on the latest revision date of this document. (See 3.1)

SPECIFICATIONS

MILITARY

MIL-C-17/133	Cables, Radio Frequency, Coaxial, 0.086 Diameter, semi-Rigid, 50 Ohms
MIL-F-14072	Finishes for Ground Based Electronic Equipment
MIL-PRF-39012	Connectors, Coaxial, Radio Frequency, General Specification for
MIL-DTL-45204	Gold Plating, Electrodeposited
MIL-T-81490	Transmission lines, Transverse Electromagnetic Mode

STANDARDS

MILITARY

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-202	Test Methods for Electronic and Electrical Component Parts
MIL-STD-454	Standard General Requirements for Electronic Equipment
MIL-STD-1285	Marking of Electrical and Electronic Parts
MIL-STD-2000	Standard Requirements for Soldered Electrical and Electronic Assemblies



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OTHER

ASME Y14.100	Engineering Drawing Practices
ASTMB196/196M	Standard Specification for Copper-Beryllium Alloy Rod and Bar
ASTMB197	Standard Specification for Copper-Beryllium Alloy Wire
ASTMD4894	Standard Specificaation for Polytetrafluoroethylene (PTFE) Granular Molding and Ram Extrusion Materials
ASTMD1710	Standard Specification for Polytetrafluoroethylene (PTFE) Basic Shapes, Rod, and Heavy-Walled Tubing
ASTM A582	Standard Specification for Free-Machining Stainless Steel Bars
SAE AMS2404	Plating, Electroless Nickel
SAE AMS 5640	Steel, Corrosion-Resistant, Bars, Wire, and Forgings 18Cr-9.0Ni Free Machining

3. REQUIREMENTS

3.1 Drawing precedence. This drawing takes precedence over documents referred to herein and shall be interpreted in accordance with ASME Y14.100.

3.2 Design requirements.

3.2.1 Definition. The connector shall meet the requirements specified herein over the temperature range of -65°C to +138°C, from sea level to 70,000 feet. The frequency range shall be DC through 18.5 GHz.

3.3 Electrical. The electrical requirements shall be met before, during and after the mechanical and environmental tests specified herein. All electrical requirements shall be met over the frequency range of DC through 18.5 GHz.

3.3.1 Insulation resistance. The insulation resistance shall be as follows:

- a. 5000 megohms minimum before moisture resistance test.
- b. 1000 megohms minimum during and after moisture resistance test.

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3.3.2 Impedance. The impedance shall be 50 ± 2 ohms.

3.3.3 Dielectric withstanding voltage. There shall be no evidence of flashover or electrical breakdown (see 4.5.2).

- a. Sea Level: 500 Vrms, 60 Hz.
- b. 70,000 Feet: 125 Vrms, 60 Hz.

3.3.4 Operating voltages. The connector (in mated condition) shall operate with the following voltages applied without evidence of arcing or breakdown.

- a. Sea Level: 335 Vrms, 60 Hz.
- b. 70,000 Feet: 85 Vrms, 60 Hz.
- c. Corona Level, 70,000 Feet: 190 Vdc.

3.3.5 RF high potential. The radio frequency high potential shall be 325 Vrms at 5 MHz.

3.3.6 VSWR. When the connectors are tested as specified in 4.5.6, the VSWR of an interconnect assembly shall not exceed 1.2 to 1.

3.3.7 RF leakage. The radio frequency leakage of an interconnect assembly shall not exceed -80 dB from 1-3 GHz and -65 dB from 3-18.5 GHz (see 4.5.1) when installed.

3.3.8 Insertion loss. The insertion loss of an interconnect assembly shall not exceed $[0.03 \times \text{square root of } F \text{ (GHz)}]$ dB. The average insertion loss shall be an increasing function of the RF input frequency.

3.3.9 Contact resistance. When the connectors are tested as specified in 4.5.7, the contact resistance between the center pin of the mating connector and the center contact of the connector shall not exceed 6.0 milliohms with 1.0 ampere of applied current.

3.4 Mechanical. The mechanical requirements shall be in accordance with Figure 1 herein. The connector shall meet the electrical parameters before, during and after the mechanical tests specified herein.

3.4.1 Durability. There shall be no mechanical damage to the center (female) contact when tested in accordance with 4.5.5. The connectors shall meet the requirements of 3.3.

3.4.2 Contact retention. The contact shall not be displaced from the specified interface dimensions (see Figure 1) when an axial force of 1.5 pounds is applied in either direction.



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3.4.3 Physical characteristics. The connector shall meet the physical characteristics of the applicable figure specified herein. The center conductor shall have a self retention feature.

3.4.4 Contact engagement and separation forces. When tested in accordance with 4.5.4, the female contact shall meet the forces specified below during insertion and withdrawal of the test pin.

- a. Two (2) ounce minimum (see para. 4.5.4b).
- b. Sixteen (16) ounce maximum (see para. 4.5.4a).

3.4.5 Marking. Parts shall be marked in accordance with MIL-STD-130 (see 5.2).

3.4.6 Plating integrity. There shall be no evidence of flaking, peeling, blistering of gold plating or exposure of underplate or base metal. This requirement is for the housing (shell) only. Inspection shall be accomplished by using $10\pm 2X$ power magnification.

3.4.7 Connector retention. The connector retention engagement and separation forces shall be as follows:

Engagement force shall be 15 pounds maximum.

Separation force shall be 2 pounds minimum.

3.5 Material. Material shall be as specified herein.

3.5.1 Center conductor. The center conductor shall be beryllium copper in accordance with ASTM B196/196M-07, UNS-C17300 Temper TD04(H).

3.5.2 Adapter housing. Adapter housing for 1874AS8511 shall be beryllium copper in accordance with ASTM B196/196M or ASTM B197. Adapter housing for 1874AS8511-1 shall be stainless steel CRES 303 in accordance with ASTM A582, Condition A and SAE AMS5640, Type I.

3.5.3 Dielectric. Dielectric shall be polytetrafluoroethylene in accordance with ASTM D4894 and ASTM D1710.

3.6 Finish. Finish shall be as specified herein.

3.6.1 Contacts. Contacts shall be gold plated in accordance with MIL-DTL-45204, Type I, Class 1, Grade C, 50-150 μ inches, 75 μ inches typical over nickel plate in accordance with SAE AMS2404, Class 3, 50-150 μ inches, 100 μ inches typical.

3.6.2 Connector housing. Connector housing shall be gold plated in accordance with MIL-DTL-45204, Type I, Class 1, Grade C, 50-150 μ inches, 75 μ inches typical over nickel plate in accordance with SAE AMS2404, Class 3, 50-150 μ inches, 100 μ inches typical.

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3.6.3 Fungus resistance. Materials or chemicals that are nutrients for fungi as specified in MIL-STD-454, Requirement 4, shall not be used.

3.7 Environmental. The connectors shall be designed to withstand the environments specified in MIL-PRF-39012 in any sequence or combination of sequences. During and after exposure to these environments, there shall be no degradation of thermal or electrical performance, deterioration of protective coatings, pitting or other loss of dimensional integrity, binding of moving parts, cracking, loose parts or detrimental damage of any type, and the connectors shall meet the requirements of this drawing.

3.7.1 Environmental capability demonstration. The manufacturer shall be responsible for his design to meet the environmental requirements specified herein.

3.8 Workmanship. The manufacturer shall conform to all the applicable requirements of MIL-STD-454, Requirement 9, Workmanship.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection.

4.1.1 Manufacturer. The manufacturer is responsible for controlling the quality of his product and for offering to the procuring activity only those parts that conform to all specified requirements.

4.1.2 The procuring activity reserves the right to perform any inspection or test deemed necessary to assure that parts conform to the specified requirements including the right to perform in-process inspections at the manufacturer's facilities.

4.2 Qualification tests. Corning Gilbert connector part numbers 0406-205-1 and J114-D91-01, have been qualified by the procuring activity for use in its product. Any change in the material, design, or manufacture of this connector may nullify this qualification. Corning Gilbert must notify the procuring activity in writing of any changes in the material, design, or manufacture of part numbers 0406-205-1 or J114-D91-01.

4.3 Acceptance inspection. The manufacturer shall be responsible for the performance of all the inspection requirements specified herein (see Table I and II). All parts supplied to this specification shall be from lots which have passed the following inspection test: an Acceptance Test Plan (ATP) shall be approved by the procuring activity prior to shipment of parts. Performance capabilities shall be demonstrated with connector parts mounted in test fixturing agreed upon by the procuring activity. Parts shall be inspected per MIL-PRF-39012, Groups A & B. Sampling number shall be determined using MIL-PRF-39012, Table IV.



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4.4 Test data. The manufacturer shall maintain in a safe place, all test data for a period of three years.

4.5 Test methods.

4.5.1 Electromagnetic interference (EMI). When tested in accordance with the approved QTP and/or ATP the requirements of 3.3.7 shall be met.

4.5.2 Dielectric withstanding voltage. The dielectric withstanding voltage shall be applied at a rate not exceeding 300 Vrms per second under the following conditions:

Sea level and 70,000 feet: Temperature $25 \pm 3C$ at 40-60% humidity (see 3.3.3).

4.5.3 Insulation resistance. Insulation resistance shall be conducted in accordance with MIL-STD-202, Method 302, Test Condition B (see 3.3.1).

4.5.4 Contact engagement and separation forces. The contact insertion and withdrawal forces shall be checked with a hardened steel test pin with a 4 to 8 microinch finish. The test pin shall be inserted to a depth of $.060 \pm .005$ inch and withdrawn. The test shall be conducted in the sequence outlined below:

a. Maximum diameter pin: $0.0160 + .0000 / -.0001$ inch (see 3.4.4b).

b. Minimum diameter pin: $0.0140 + .0001 / -.0000$ inch (see 3.4.4a).

4.5.5 Connector durability. The connector shall be mounted for this test. An $0.0160 + .0000 / -.0001$ inch diameter pin shall be inserted $.062 \pm .010$ inch into the center (female) contact and withdrawn 250 times. Then an $0.0140 + .0001 / -.0000$ inch diameter pin shall be inserted $.060 \pm .010$ inch and the requirements of 3.3 shall be met. The 0.0140 inch diameter pin when withdrawn shall meet the requirements of 3.4.1.

4.5.6 VSWR. The VSWR test shall be conducted in accordance with MIL-PRF-39012 or a buyer approved ATP (see 3.3.6).

4.5.7 Contact resistance. The contact resistance test shall be conducted in accordance with MIL-PRF-39012 (see 3.3.9).

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5. PREPARATION FOR DELIVERY

5.1 Preservation, packing and packaging. Preservation and packaging shall be Level C of MIL-T-81490; adaptor assemblies shall be individually packaged in plastic bags.

5.2 Unit container. The smallest unit container shall be marked with the following information:

- a. The part identification number.
- b. The manufacturer's name, registered trademark or CAGE number.
- c. Manufacturer's part number.
- d. Date code in accordance with MIL-STD-1285.

5.3 Shipping container. The shipping container shall be legibly marked with the following information:

- a. The part identification number.
- b. Manufacturer's name, registered trademark or CAGE number.
- c. Purchase order number.

6. NOTES

6.1 Callout. Identify by this drawing number and applicable dash number for purchase, stocking and parts list.

6.2 "Identification of the suggested source(s) of supply hereon is not to be construed as a guarantee of present or continued availability as a source of supply for the item(s)".

Suggested Source(s) of Supply			
Control Number	SUPPLIER DATA		
	CAGE	Part No.	Name and Address
1874AS8511	82316	0406-205-1	Corning Gilbert Incorporated 5310 W. Camelback Road Glendale, Arizona 85301
1874AS8511-1		J114-D91-01	

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Table I. Group A inspection. (Each Lot)

Inspection	Requirement Paragraph	Method Paragraph	AQL (percent defective)
Visual and mechanical examination			
Material	3.5	4.3	1.5
Finish 1/	3.6	↓	↓
Construction	3.4		
Marking	3.4.5		
Workmanship	3.8		
Mating (visual indication)		↓	↓
Dielectric withstanding voltage	3.3.3	4.5.5	1.5

Notes.

- 1/. 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.

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Table II. Group B inspection. 1/, 2/, 3/

Inspection	Requirement Paragraph	Method Paragraph
VSWR	3.3.6	4.5.6

Notes.

- 1/. Group B inspection. Group B inspection shall consist of the inspections specified in Table II in the order shown, and shall be made on sample units which have been subjected to and passed the Group A inspection.
- 2/. Sampling plan. The sampling plan shall be in accordance with MIL-STD-105 for special inspection level S-4. The sample size shall be based on the inspection lot size from which the sample was selected for Group A inspection. The AQL shall be 2.5 percent defective.
- 3/. Disposition of sample units. Sample units which have passed all the Group B inspections may be delivered on the contract or purchase order, if the lot is accepted. Any connector or connector part deformed or otherwise damaged during testing shall not be delivered on the contract or order.

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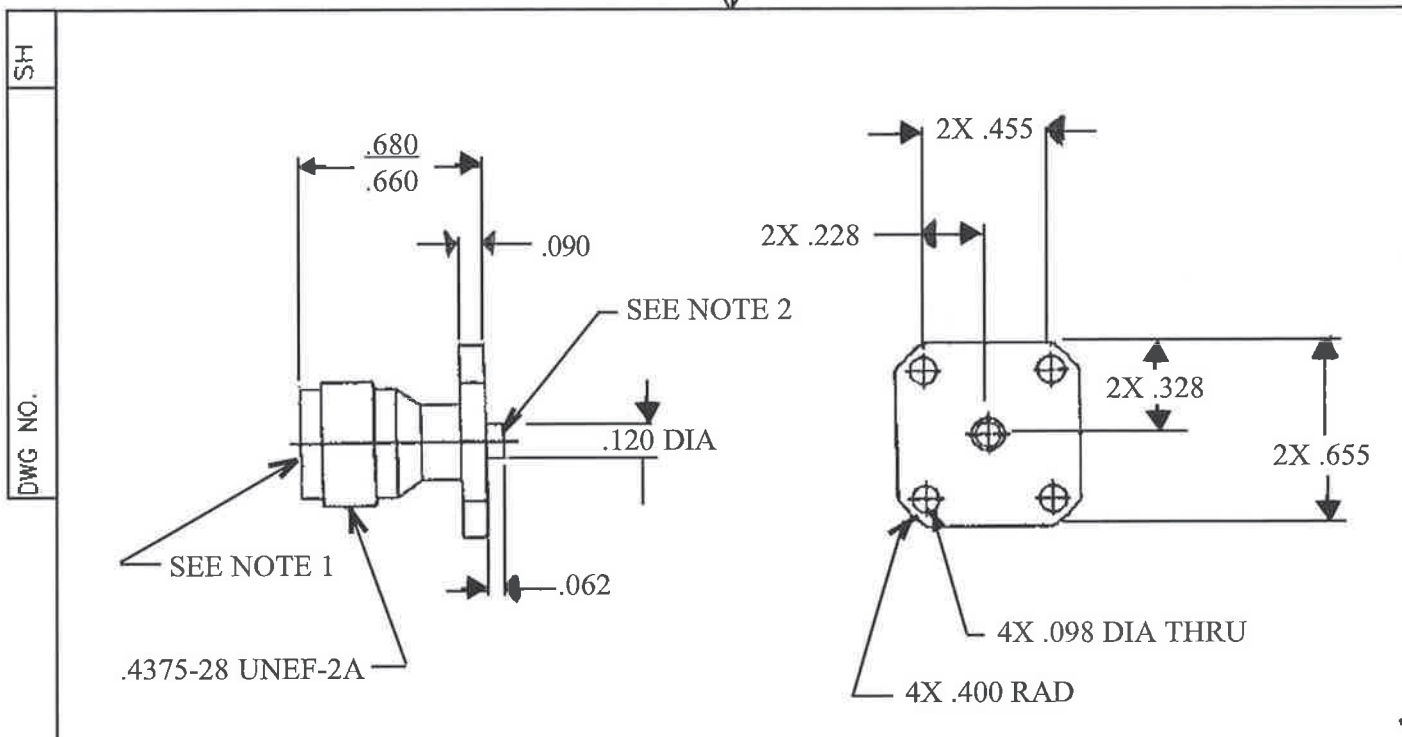


Figure 1. Connector, EWTNC to 0.086 semirigid cable, flange mount

Notes.

1. Connector is designed to be 100% intermateable with MIL-T-81490.
2. Accepts semirigid cable per MIL-C-17/133-00008.
3. Weight: 0.250 oz. maximum.
4. Tolerances: $\pm .005$ unless otherwise noted.

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