

# Differential Twinax Contacts

## General Description

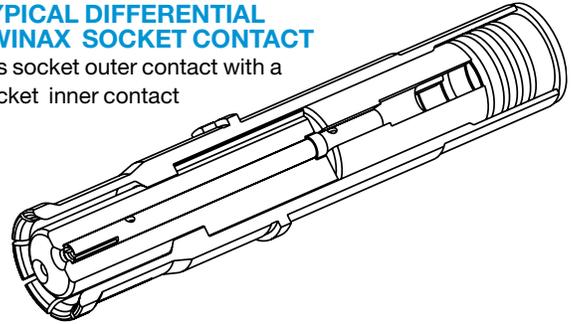
### AMPHENOL DIFFERENTIAL TWINAX CONTACTS

Offer several advantages for high data transfer rates, low power consumption and excellent EMI compatibility:

- Two strategically spaced inner contacts form two 100 or 150 Ohm matched impedance differential pairs
- Outer contact has rugged wall section for durability
- Available in size 8 crimp termination style
- Also available in size 8 with PC tails
- Requires modification of MIL-DTL-38999 connector to accommodate keyed contacts

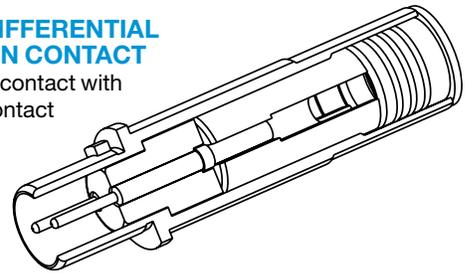
#### TYPICAL DIFFERENTIAL TWINAX SOCKET CONTACT

has socket outer contact with a socket inner contact

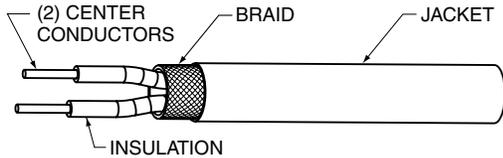


#### TYPICAL DIFFERENTIAL TWINAX PIN CONTACT

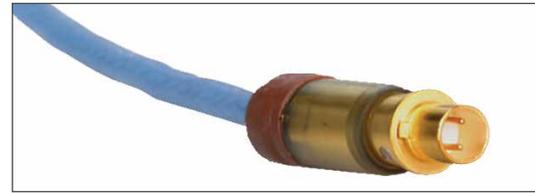
has pin outer contact with a pin inner contact



#### CABLE ILLUSTRATION DIFFERENTIAL TWINAX CONTACT



Differential Twinax Socket Contact



Differential Twinax Pin Contact

#### DIFFERENTIAL TWINAX CONTACTS ARE GOLD PLATED, CRIMP TERMINATION

Finish of mating contact parts: supplied with 0.000050 min. gold over nickel on mating interface.

#### DIFFERENTIAL TWINAX SIZE 8 CONTACT PERFORMANCE:

**Bandwidth:** Up to 1.25 GHz

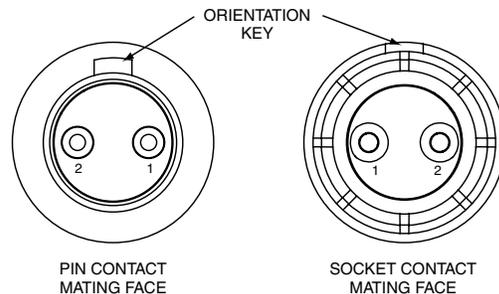
**Data Rate:** Exceeding 2.5 Gbps

**Voltage Rating:** 500 Vrms max. @ sea level

#### Dielectric Withstanding

- Voltage:**
- 1000 VAC rms between all inner contacts @ sea level
  - 500 VAC rms between inner and outer contacts @ sea level

#### SUGGESTED NUMBERING OF DIFFERENTIAL TWINAX CONTACTS



#### DIFFERENTIAL TWINAX CONTACT DATA

Contacts are inserted by hand. Refer to termination instructions listed. Contacts are removed with a removal tool. Recommended tool is MIL-I-81969/14-06, Daniels DRK-264-8. Refer to termination instructions listed. Finish of mating contact parts: Contact part numbers shown in the chart are supplied gold plated per ASTM B488 Type II, Code C, .000050 min. thick over nickel plate per AMS-QQ-N-290, Class 2, .000030/.000150 thick.

DIFFERENTIAL TWINAX CONTACTS FOR USE IN TV-R CONNECTORS								
Impedance (Ohms)	Contact Size	Electrical Protocol††	Cable	Contact Part Number (Termination Instruction Sheet)**				
				Pin	Socket			
100	8	Ethernet, USB	26463/70460X-2 (98 Ohm)	21-033387-021 (L-2119-E)	21-033388-021 (L-2119-E)			
			Fileca 2709-3					
			GORE GSC-05-82559-00					
			Gore RCN9034					
			NF24T100-200C (Space)					
			PIC E10224					
			REV. B Raychem 0024A0024					
			S280W502-1					
			ST5M1284-003 (98 Ohm)					
			Tensolite 24463/05099X-8(LD)					
			Tensolite 24463/9P025X-2(LD)					
			Thermax 12814					
			Thermax MX 100-24					
			GORE GSC-05-827300-00					
			Tensolite 26453/03184X-2(LD)					
			Thermax 956-626Z					
							21-033387-051*** (L-2119-AY)	21-033388-051*** (L-2119-AY)
			ASNE08072003-09, -041					
			Cheminax 7726SOLL 4					
			DXN 2310					
			GORE GSC-05-8193-00					
			GORE GSC-05-827300-00					
			Tensolite 26453/03184X-2(LD)					
			Thermax 956-626Z					
							21-033387-041 (L-2119-T)	21-033388-041 (L-2119-T)
			23460/05114X-2(LD)					
			PIC E1024					
			M17/176-00002 (77 Ohm)					
			Raychem 0026A0024					
							21-033387-061 (L-2119-BH)	21-033388-061 (L-2119-BH)
			CAN24TST120					
			JSFY11-24					
			Tensolite 24463/03220T-2(LD)					
Thermax 956-1T200								
				21-033387-101 (L-2119-AK)	21-033388-101 (L-2119-AK)			
S280W502-6								
Tensolite 24463/9P026X-2(LD)								
				21-033387-131	21-033388-131			
AXON P509782								
CAN24TDT120								
				21-033387-141	21-033388-141			
GC875ACH								
				21-033387-151	21-033388-151			
Tensolite 26453/03184X-2(LD)								
				21-033387-161	21-033388-161			
Gore DXN 2125								
				21-033387-031 (L-2119-AC)	21-033388-031 (L-2119-AC)			
Tensolite 26483/03071X-2(LD)								
150		Fibre Channel, 1000 Base-CX Ethernet	Tensolite 26483/03071X-2(LD)	21-033456-001 (L-2119-BX)†	21-033457-001 (L-2119-BX)†			

Daniels crimping tools are available from Daniels Mfg. Corp. 6103 Anno Ave., Orlando, FL 32809  
 \* Requires modified connector to accommodate keyed contacts.  
 \*\*\* Indicated contact is vacuum degassed  
 †† Test reports available for indicated protocols. Consult Amphenol Aerospace.

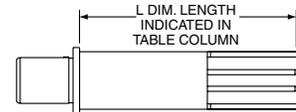
\*\* Termination instructions are packaged with each contact and can be found on-line at: [www.amphenol-aerospace.com/serviceinstructions.asp](http://www.amphenol-aerospace.com/serviceinstructions.asp)  
 † Consult Amphenol Aerospace for current release of this instruction sheet.

# Differential Twinax Contacts

## MIL-DTL-38999, Series III\*, Contact Part Number Guide by Cable

PCB DIFFERENTIAL TWINAX CONTACTS FOR USE IN TV-R CONNECTORS				
Impedance (Ohms)	Contact Size	PCB Twinax Contacts Length	Contact Part Number	
			Pin	Socket
100	8	.494	21-033834-041	21-033835-041
		.530	21-033834-131	21-033835-131
		.780	21-033834-061	21-033835-061
		.788	21-033834-031	21-033835-031
		.806	21-033834-111	21-033835-111
		.819	21-033834-141	21-033835-141
		.843	21-033834-101	21-033835-101
		.871	21-033834-071	21-033835-071
		.908	21-033834-121	21-033835-121
		.937	21-033834-081	21-033835-081
		.939	21-033834-051	21-033835-051
		1.035	21-033834-001	21-033835-001
		1.035	21-033834-091	21-033835-091
		1.035	21-033834-021	21-033835-021
150		1.035 mates to 21-33456/57 series	21-033458-001	21-033457-001

Indicated length given in chart at left is the distance from the rear of the contact retention shoulder to the tip of the PCB tails.

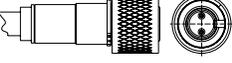
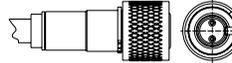
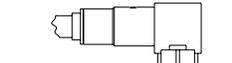


Note: It does not indicate stickout length when installed in D38999 connector.

Daniels crimping tools are available from Daniels Mfg. Corp. 6103 Anno Ave., Orlando, FL 32809

# Differential Twinax Transition Adapters

## MIL-DTL-38999, Series III, Attachment to PC Boards Data

100 OHM DIFFERENTIAL TWINAX TRANSITION ADAPTERS FOR LAUNCHING CONTROLLED IMPEDANCE SIGNALS TO PC BOARDS						
Illustration of Adapter	Impedance (Ohms)	Differential Twinax Type Adapter/ Cable or PCB Tail Length	Mating Thread Size	Part Number (Termination Instruction Sheet)**		
				Plug	Receptacle	
	77	M17/176-00002 (77 ohms)	.3125	21-033832-081 (L-2119-AJ)		
		24463/9P026X-2		21-033832-081 (L-2119-AJ)		
		Tensolite 24463/9P025X-2(LD) 10-646060		21-033832-021 (L-2119-P)		
		Tensolite 24463-9P025X-2(LD) hex nut w/lockwire holes		21-033832-181		
		PCB Differential Twinax Receptacle 90 Degree Adapter/ Tail Length .110			21-033833-021	
		PCB Differential Twinax Receptacle Straight Adapter/ Tail Length .110			21-033833-031	
	100	Tensolite CAN22TDT120 (120 Ohm)	.375	21-033832-111†		
		PCB Differential Twinax Receptacle 90 degree Adapter/Tail Length .283			21-033833-161†	
		PCB Differential Twinax Receptacle Straight Adapter/Tail Length .283			21-033833-171†	
		Differential Twinax Receptacle 90 degree Adapter (low profile) with cable to board/ Tensolite 24463/9P026X-2	N/A		21-033833-091 (L-2119-AF)	
		Differential Twinax Receptacle 90 degree Adapter with cable to board/ Tensolite 24463/9P025X-2			21-033833-051 (L-2119-V)	
		Differential Twinax Receptacle 90 degree Adapter with cable to board/ Tensolite 24463/9P025X-2			21-033833-141 (L-2119-BU)	

† Consult Amphenol Aerospace for current release of this adapter and instruction sheet if applicable.  
See electrical protocols for transition adapters on page 36.

\*\* Termination instructions are packaged with each contact and can be found on-line at:  
[www.amphenol-aerospace.com/serviceinstructions.asp](http://www.amphenol-aerospace.com/serviceinstructions.asp)

# Differential Twinax Transition Adapters

## MIL-DTL-38999, Series III, Attachment to PC Boards Data

150 OHM DIFFERENTIAL TWINAX TRANSITION ADAPTERS FOR LAUNCHING CONTROLLED IMPEDANCE SIGNALS TO PC BOARDS						
	Illustration of Adapter	Impedance (Ohms)	Differential Twinax Type Adapter/Cable or PCB Tail Length	Mating Thread Size	Part Number (Termination Instruction Sheet)**	
					Plug	Receptacle
Mating plugs and receptacles		150	Differential Twinax Plug Adapter/ Tensolite 26483/03071X-2	.375	21-033832-091 (L-2119-BR)	
			PCB Differential Twinax Receptacle 90 Degree Adapter/ Tail Length .110			21-033833-111
			PCB Differential Twinax Receptacle Straight Adapter/ Tail Length .110			21-033833-181†
Wired to board		150	Differential Twinax Receptacle 90 degree Adapter with cable to board/ Tensolite 26483/03071X-2	N/A		21-033833-101 (L-2119-BM)†

† Consult Amphenol Aerospace for current release of this adapter and instruction sheet, if applicable.

\*\* Termination instructions are packaged with each contact and can be found on-line at: [www.amphenol-aerospace.com/serviceinstructions.asp](http://www.amphenol-aerospace.com/serviceinstructions.asp)



90° Differential Twinax Receptacle and Plug Transition Adapter

### TRANSITION ADAPTER DATA

Finish of mating contact parts: Contacts are supplied gold plated per ASTM B488 Type II, Code C, .000050 min. thick over nickel plate per AMS-QQ-N-290, Class 2, .000030/.000150 thick.

ELECTRICAL PROTOCOLS FOR DIFFERENTIAL TWINAX TRANSITION ADAPTERS			
Impedance (Ohms)	Electrical Protocol††	Part Number	
		Plug	Receptacle
100		21-033832-81	
	Ethernet	21-033832-21	
		21-033832-111†	
			21-033833-021 (90°)
	Ethernet		21-033833-031 (90°)
			21-033833-151 (90°)
			21-033833-161† (90°)
			21-033833-171† (90°)
			21-033833-091 (90°)
			21-033833-051 (90°)
150		21-033832-91	
			21-033833-111 (90°)
			21-033833-181† (90°)
			21-033833-101 (90°)

† Consult Amphenol Aerospace for current release of this adapter.

†† Test reports available for indicated protocols; consult Amphenol Aerospace.

# Micro Differential Twinax Transition Adapters

## Push-Pull Quick-Disconnect Interconnects

### MICRO DIFFERENTIAL TWINAX TRANSITION ADAPTERS

Amphenol now offers differential twinax transition adapters in smaller sizes that provide matched impedance interconnection to PCB boards. Our unique push-pull quick disconnect adapter design offers:

- Advantages over traditional threaded type adapters
- Launching of controlled impedance (100 ohm) signals for high speed twinax contacts with push-pull quick disconnect coupling
- Rugged construction, 100+ mating cycles for reliable and secure data transmission
- Miniature size for tighter spacing on boards
- Intermountability with existing threaded solutions having the same PCB tail footprint

#### STYLES INCLUDE:

- Plug - standard length and extended length options
- Straight PCB receptacle, 90° PCB receptacle
- Two jam nut receptacle styles - both with standard length and extended length options
- Bushing assembly 90° adapter (used with plug or jam nut receptacle)

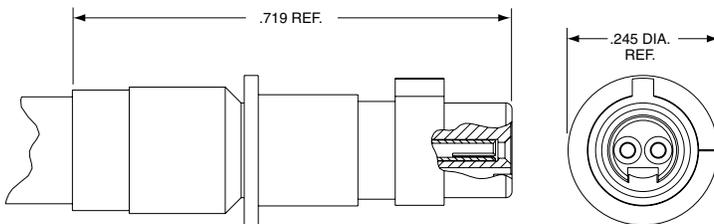


Micro Differential Twinax Transition Adapters  
Shown right: Straight receptacle mated to plug  
Shown left: Jam nut and 90° receptacles

Quadrax, Differential Twinax

Adapters

### MICRO DIFFERENTIAL TWINAX TRANSITION ADAPTER PLUG

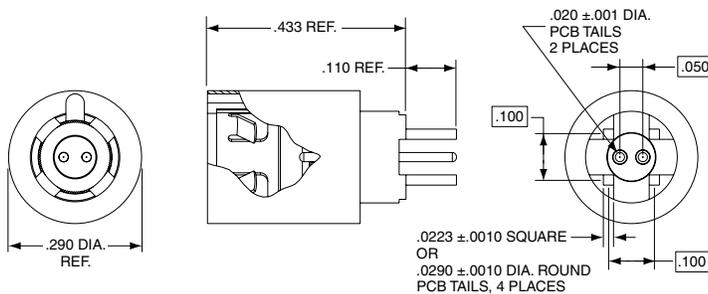


Impedance (Ohms)	Cable Type*	Part Number
100	Calmont 3007-1923-12-7	21-033832-151
	Calmont 3007-1923-12-7	21-033832-121**
	Tensolite 26453/03184X-2LD	21-033832-161
	Thermax 956-626Z	
	Thermax 956-626S	

\* See page 39 for information on other cable terminations.

\*\* Same as -151 with extended ferrule for added cable support

### MICRO DIFFERENTIAL TWINAX TRANSITION ADAPTER STRAIGHT PCB RECEPTACLE



Straight receptacle mated to plug

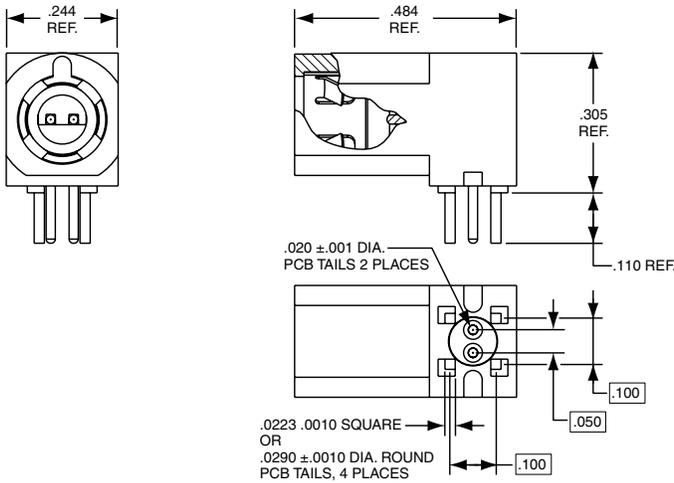
Impedance (Ohms)	Part Number
100	21-033833-191

All dimensions for reference only.

# Micro Differential Twinax Transition Adapters

## Push-Pull Quick Disconnect Interconnects

### MICRO DIFFERENTIAL TWINAX TRANSITION ADAPTER 90° PCB RECEPTACLE



90 Degree receptacle mated to plug

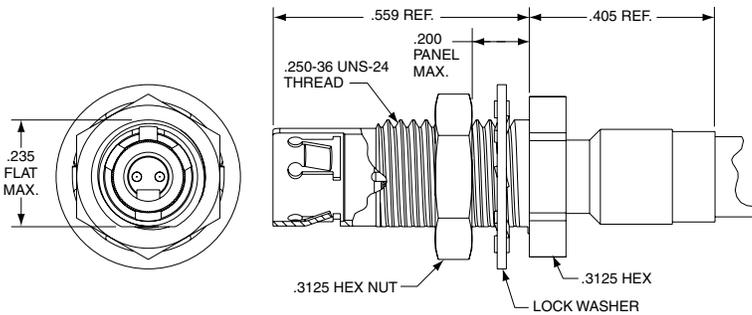


Impedance (Ohms)	Part Number
100	21-033833-201
	21-033833-281
	.140 PCB tail length

### MICRO DIFFERENTIAL TWINAX TRANSITION ADAPTER JAM NUT RECEPTACLES

#### JAM NUT RECEPTACLE, STYLE 1

Smaller diameter front shell requires a smaller mounting D-hole dimension in panel.



Jam nut receptacle, Style 1, mated to plug



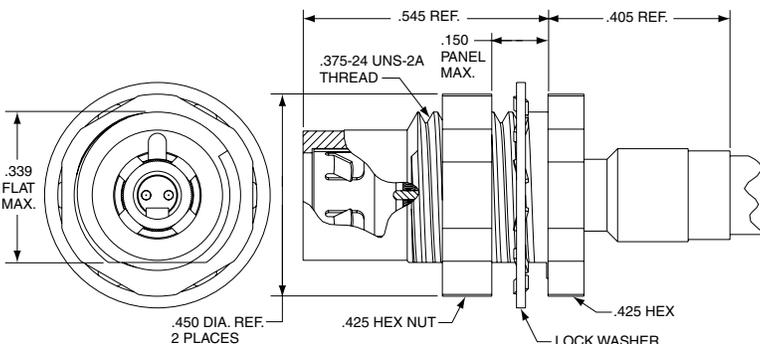
Impedance (Ohms)	Cable Type*	Part Number
100	Calmont 3007-1923-12-7	21-033833-211**
	Calmont 3007-1923-12-7	21-033833-241
	Tensolite 26453/03184X-2LD	21-033833-261
	Thermax 956-626Z	

\* See page 39 for information on other cable terminations.

\*\* Same as -241 with extended ferrule for added cable support

#### JAM NUT RECEPTACLE, STYLE 2

Has a larger diameter front shell than Style 1. Requires a larger mounting D-hole in panel.



Jam nut receptacle, Style 2, mated to plug



Impedance (Ohms)	Cable Type*	Part Number
100	Calmont 3007-1923-12-7	21-033833-231**
	Calmont 3007-1923-12-7	21-033833-251
	Tensolite 26453/03184X-2LD	21-033833-271
	Thermax 956-626Z	

\* See page 39 for information on other cable terminations.

\*\* Same as -251 with extended ferrule for added cable support

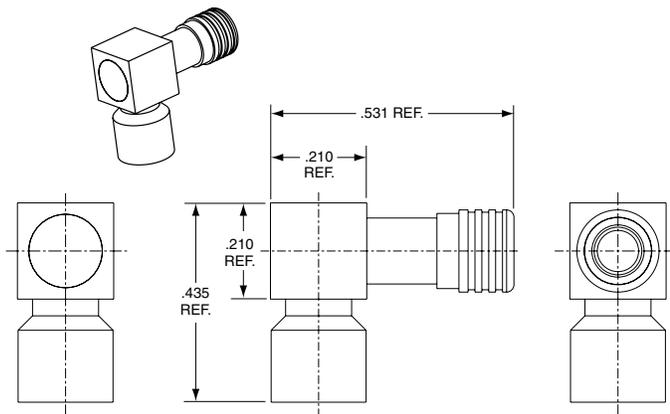
All dimensions for reference only.

# Micro Differential Twinax Transition Adapters

## Push-Pull Quick Disconnect Interconnects

### 90° BUSHING ASSEMBLIES FOR USE WITH WIRED MICRO DIFFERENTIAL TWINAX TRANSITION ADAPTERS

Amphenol provides bushing assemblies which convert straight plug and receptacle wired adapters into 90° wired adapters. To facilitate tight cable bend requirements.



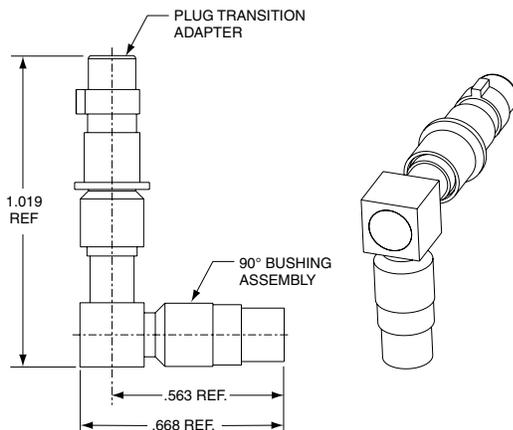
90° Bushing Assembly with  
Jam Nut Micro Differential Transition Adapter

90° Bushing Assembly  
Part Number

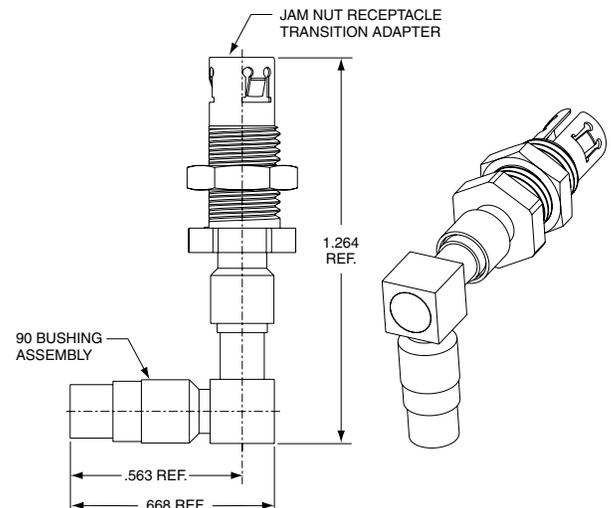
21-033425-201

90° bushing assembly is ordered separately.  
Adapters are not included with bushing assembly.

Illustrations below show how the 90° bushing assembly attaches to either a plug or a jam nut receptacle adapter.



**90° BUSHING ASSEMBLY WITH WIRED MICRO DIFFERENTIAL PLUG TRANSITION ADAPTER**



**90° BUSHING ASSEMBLY WITH WIRED MICRO DIFFERENTIAL JAM NUT RECEPTACLE TRANSITION ADAPTER**

Amphenol transition adapters are capable of terminating to additional 100 Ohm cables beyond what are listed in the charts on pages 37 and 38.

**Cables need to have the following dimensions:**

- .0210/.011 Dia. stranded center conductor (26/30 AWG)
- .045 Dia. max. inner wire insulation
- .115 Dia. max. outer braid (round type preferred)
- .150 Dia. max. jacket
- Consult Amphenol Aerospace for other cable termination possibilities.

All dimensions for reference only.