

Amphenol® Connectors are ideally suited for the incorporation of shielded contacts for high performance interconnection applications. The circular family is built around MIL-DTL-38999 specifications, with Mil-approved and commercial styles offered. Normal operating voltage for circulars with power contacts only is up to 900 VAC (RMS) at sea level.

### The MIL-DTL-38999 family offer these features for contact termination flexibility:

- Widest selection of insert arrangements that can incorporate:
  - Size 8 high speed Quadrax and Differential Twinax contacts for MIL-DTL-38999 Series III (specially modified to accommodate keyed contacts)
  - Transition adapters for use in attaching D38999 Series III connectors with high speed quadrax or differential contacts to PCB boards
  - Size 8, 12 and 16 Coax contacts
  - Size 8 and 12 Twinax contacts
  - Size 8, 10 & 12 Triax contacts
- Wide selection of connector shell styles and sizes
- Scoop-Proof recessed design in LJT-R, TV-R and SJT-R connectors provide protection for contacts
- Standard power contacts are crimp rear release, qualified to SAE AS39029
- Coax, Twinax, and Triax contacts employ the same retention system as power contacts, simplifying user substitution

### GENERAL ORDERING INFORMATION

Amphenol MIL-DTL-38999, which feature rear removable contacts, are normally supplied with a full complement of power contacts, separately packaged. Coax, twinax and triax contacts are ordered by part number as referenced in the part number charts on the following pages of this catalog, and are substituted for the power contacts at the time of the cable or equipment assembly. If the application is for coax, twinax or triax contacts only, the connector may be ordered *less contacts* and no power contacts will be supplied.

### HOW TO ORDER CONNECTORS AND HIGH FREQUENCY CONTACTS

- Select the Circular Series desired.  
(See features of each series given briefly on this page and in-depth in the other sections of this catalog, which are on-line at [www.amphenol-aerospace.com](http://www.amphenol-aerospace.com)).  
Series I - LJT-R Connectors  
Series II - JT-R Connectors  
Series III - TV-R Connectors  
SJT\* - SJT-R Connectors  
See Amphe-Lite (Industrial 38999 type) Catalog 12-094
- Select the quadrax, differential twinax, coax, twinax and/or triax contacts or the transition adapters that are needed from the tables on the following pages that correspond to the cable being used.
- Select the insert arrangement to accommodate required number of contacts. Insert patterns for quadrax and differential twinax contacts are on pages 387,388. Insert patterns for coax, twinax and triax contacts are on pages 404-406.
- Complete the connector part number from the connector series catalog, incorporating the chosen insert pattern number. See detailed how to order page 389 for ordering 38999, Series III with quadrax and differential twinax contacts. Consult Amphenol for assistance in ordering 38999 circulars with coax, twinax and triax contacts.
- Consult Amphenol Aerospace for ordering information for connectors with PC tail contacts, and for transition adapters.
- If connector is ordered less contacts, power contacts and/or sealing plugs may be ordered separately to fill out the insert arrangement.



TV-R, Tri-Start, D38999 Series III

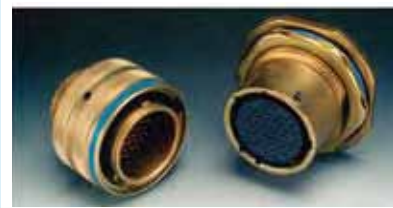
- High performance capability series for both general duty and severe environment applications
  - Offers the widest range of Subminiature Family Mil-Spec qualified options in contact and connector styles
  - Threaded coupling; completely mates in one turn; crimp termination
  - Superior EMI/EMP shielding effectiveness
  - Scoop-proof design (recessed pins)
  - Available in aluminum, stainless steel and firewall, or lightweight composite styles
- See 38999 section Series III for complete information on this section.



JT-R, D38999 Series II

See 38999 section Series II, JT for complete information on this series.

- Shorter profile connector series for applications requiring maximum space savings
- Bayonet coupling, crimp termination
- Also available in solder termination types under MIL-DTL-27599 Series II



LJT-R, D38999 Series I

See 38999 section Series I, LJT for complete information on this series.

- Scoop-proof (recessed pins)
- Bayonet coupling, crimp termination
- Also available in solder termination types under MIL-DTL-27599 Series II



Amphe-Lite, 38999 Type

See Catalog 12-094 for complete information on this series.

- Commercial/Industrial 38999 Series III type
- Cost effective high performance connector for severe environments or general duty industrial applications
- Consult Amphenol Industrial Operations for further information 12-094 catalog is on-line at [www.amphenol-industrial.com](http://www.amphenol-industrial.com).



SJT-R, 38999 Type

See the SJT section of this catalog.

- Amphenol proprietary series (non-MS) which is a further expansion of the basic JT family, but incorporates the LJT scoop-proof design
- Compliant with several European specifications

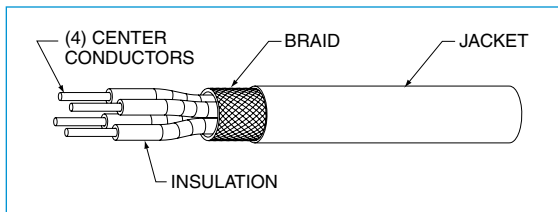
NOTE: SAE AS39029 supersedes MIL-C-39029.  
NOTE: MIL-DTL-38999 supersedes MIL-C-38999.  
MIL-DTL-27599 supersedes MIL-C-27599

# Quadrax Contacts, MIL-DTL-38999, Series III

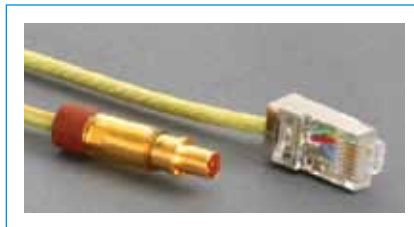
## General Description

**Amphenol® Quadrax Contacts** -offer several advantages for high data transfer rates, low power consumption and excellent EMI compatibility:

- Four 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 (see page 379)
- Requires modification of MIL-DTL-38999 connector to accommodate keyed contacts



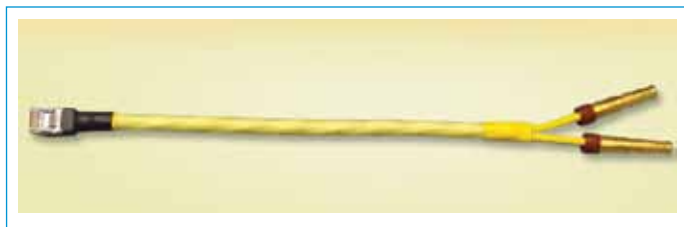
Cable Illustration - Quadrax Contact



Quadrax Pin with 8P8C "RJ45" Jack



Quadrax Pin Size 8 and MIL-DTL-38999 Series III Connector

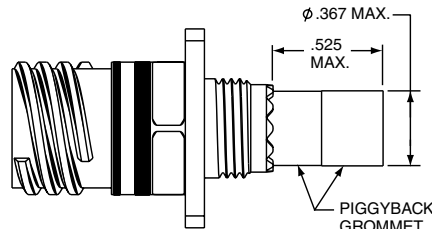


Quadrax in an Eight Wire Gigabit Ethernet Assembly

### Suggested Strain Relief - Insert Arrangements 9-5 or 19-18 with Quadrax Contacts

Due to the piggyback grommet interference with normal strain reliefs on the shell size 9 only, the recommended strain relief for the connector is: Amphenol part number TGW-R-5309-10 (OD Cad) or TGF-R-5309-10 (Electroless nickel)

- shell size 9 only. For 19-18 insert pattern, recommended backshell: Glenair 367-221-NF. This is recommended due to the proximity of the size 8 contacts in relation to the shell.



Also see Quadrax contacts for ARINC 600 and R27 Rack and Panel Connectors on page 411 and 412.

**TYPICAL QUADRIX SOCKET CONTACT**  
has socket outer contact  
with a socket inner contact

**TYPICAL QUADRIX PIN CONTACT**  
has pin outer contact with a pin  
inner contact

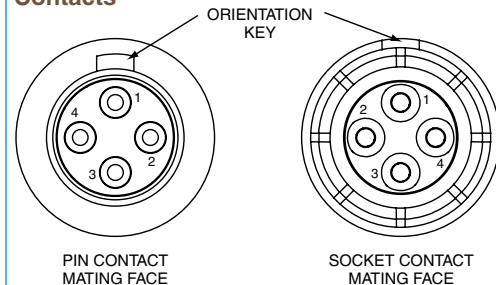
### Quadrax Contacts are gold plated, crimp termination

Finish of mating contacts parts: supplied with 0.000050 min. gold over nickel on mating parts. Consult Amphenol for availability of other finishes.

#### Quadrax Size 8 Contact Performance:

- Bandwidth: Up to 3 Gigahertz
- Data Rate: Exceeding 3 Gbits/sec.
- 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 for Quadrax Contacts



Differential Pairs, contacts 1-3, 2-4.

See page 389 for part number ordering of popularly used 38999 Series III connectors with 100 ohm quadrax contacts.

Quadrax differential pairs are 1 and 3, 2 and 4.

38999  
III  
II  
I  
SJT

26482  
Matrix 2

83723 III  
Matrix  
Pyle

5015  
Crimp Rear  
Release Matrix

26500 Pyle

Printed  
Circuit Board

EMI Filter  
Transient

Fiber Optics

High Speed  
Contacts

Options  
Others

### TV-R Series, MIL-DTL-38999 Series III\* Connectors

#### QUADRAX CONTACTS FOR USE IN TV-R CONNECTORS

| Cable                                                                                                                                                                                                                                                                                   | Contact Part Number<br>(Termination Instruction Sheet)** |                             | Impedance<br>(Ohms) | Inner<br>Conductor<br>(AWG) | Contact<br>Size | Electrical<br>Protocol††                                   | Crimping Tools                                                          |                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------|---------------------|-----------------------------|-----------------|------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------|
|                                                                                                                                                                                                                                                                                         | Pin                                                      | Socket                      |                     |                             |                 |                                                            | Inner<br>Contact                                                        | Outer<br>Contact                                  |
| Draka Fileca F-4703-3, F4704-4, Filotex ET 2PC236, Filotex ET2PF870, PIC Wire E50424 ABS0972, Tensolite 23450/04090X-4(LD)                                                                                                                                                              | 21-33384-21<br>(L-2119-A)                                | 21-33385-21<br>(L-2119-A)   | 100                 | 24                          | 8               | Ethernet, 1000 Base-T Gigabit Ethernet                     | M22520/2-01 with Positioner M22520/2-37 or with Daniels Positioner K709 | M22520/5-01 with Die Set M22520/5-45 (Location A) |
| Tensolite NF24Q100, NF24Q100-01, 24443/9P025X-4(LD), S280W502-4, 24443/03130X-4(LD), 24443/C20714X-4(LD), 24450/0120X-4(LD), NF24-2Q100, TYCO CEC-RWC-18664, GORE GSC-01-81869-01, 24443/03166X-4(LD), Thermax T956-4T200, Pic Wire E51424, Thermax MX100Q-24, NF24Q100-01-200C (Space) | 21-33384-51<br>(L-2119-D)                                | 21-33385-51<br>(L-2119-D)   |                     | 24                          |                 | Ethernet, 1000 Base-T Gigabit Ethernet                     |                                                                         |                                                   |
| Tensolite NF22Q100, NF22Q100-01, Thermax 956-5, GORE RCN 7688 Draka Fileca F-4704-5, ABS1503 KD 24                                                                                                                                                                                      | 21-33384-61<br>(L-2119-H)                                | 21-33385-61<br>(L-2119-H)   |                     | 22                          |                 | Ethernet (100 Mbps), 1000 Base-T Gigabit Ethernet (1 Gbps) |                                                                         |                                                   |
| Tensolite NF26Q100, NF26Q100-01, NF26-2Q100, PIC E51426                                                                                                                                                                                                                                 | 21-33384-71<br>(L-2119-AB)                               | 21-33385-71<br>(L-2119-AB)  |                     | 26                          |                 | Ethernet (100 Mbps), 1000 Base-T Gigabit Ethernet (1 Gbps) |                                                                         |                                                   |
| Draka Fileca F-4704-6, Gore RCN 8672                                                                                                                                                                                                                                                    | 21-33384-151<br>(L-2119-AW)                              | 21-33385-151<br>(L-2119-AW) |                     | 26                          |                 | Ethernet (100 Mbps), 1000 Base-T Gigabit Ethernet (1 Gbps) |                                                                         |                                                   |
| Tensolite NF24Q100-01 (same as 21-3338( ) -51, uses EMI Piggyback)                                                                                                                                                                                                                      | 21-33384-161<br>(L-2119-BE)                              | 21-33385-161<br>(L-2119-BE) |                     | 24                          |                 | Ethernet (100 Mbps), 1000 Base-T Gigabit Ethernet (1 Gbps) |                                                                         |                                                   |
| Gore RCN8513, JSFY18-3                                                                                                                                                                                                                                                                  | 21-33384-171<br>(L-2119-BN)                              | 21-33385-171<br>(L-2119-BN) |                     | 22                          |                 | Ethernet (100 Mbps), 1000 Base-T Gigabit Ethernet (1 Gbps) |                                                                         |                                                   |
| Tensolite NF22Q100 Special Box pattern, only mates with 21-333 ( )-181                                                                                                                                                                                                                  | 21-33384-181<br>(L-2119-BP)                              | 21-33384-181<br>(L-2119-BP) |                     | 22                          |                 | Ethernet (100 Mbps), 1000 Base-T Gigabit Ethernet (1 Gbps) |                                                                         |                                                   |
| Tensolite NF24Q100, NF24Q100-01 for 2.5 Gbps applications                                                                                                                                                                                                                               | 21-33384-191<br>(L-2119-BS)                              | 21-33385-191<br>(L-2119-BS) | 110                 | 24                          |                 | Serial FPDP Applications (2.5 Gbps)                        |                                                                         |                                                   |
| USB2 (28433/02171LX-4)                                                                                                                                                                                                                                                                  | 21-33384-101†                                            | 21-33385-101†               |                     |                             |                 | USB2.0 (480 Mbps)                                          |                                                                         |                                                   |
| Tensolite 24450/03089X-4(LD)                                                                                                                                                                                                                                                            | 21-33384-211                                             | 21-33385-211                |                     | 24                          |                 | IEEE 1394B Firewire                                        |                                                                         |                                                   |
| JSFY02-1, JSFY18                                                                                                                                                                                                                                                                        | 21-33384-221                                             | 21-33385-221                |                     | 24                          |                 | IEEE 1394B Firewire                                        |                                                                         |                                                   |
| Gore RCN8487, JSFY18                                                                                                                                                                                                                                                                    | 21-33384-231                                             | 21-33385-231                |                     | 24                          |                 | IEEE 1394B Firewire                                        |                                                                         |                                                   |
| Tensolite 24450/03089X-4(LD) Same as 21-3338( )-211 but Box pattern, mates with 21-3338( )-241 only                                                                                                                                                                                     | 21-33384-241†                                            | 21-33385-241†               |                     | 24                          |                 | IEEE 1394B Firewire                                        |                                                                         |                                                   |
| Tensolite 26473/02006X-4(LD)/Gore RCN8328 (not for new designs, use 21-33450/1 series)                                                                                                                                                                                                  | 21-33384-31<br>(L-2119-B)                                | 21-33385-31<br>(L-2119-B)   |                     | 26                          |                 |                                                            |                                                                         |                                                   |

CHART CONTINUES ON NEXT PAGE

#### QUADRAX 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 above 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.

CONTACT ORDERING: Example number given in chart 21-33384-21 should be ordered as 21-033384-021; example number 21-33384-151 should be ordered as 21-033384-151. Adding Zeros is necessary for Amphenol ordering process on all contact numbers Daniels crimping tools are available from Daniels Mfg. Corp. 6103 Anno Ave., Orlando, FL 32809

\* Requires modified connector to accommodate keyed contacts.

\*\*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 contact or instruction sheet if applicable.

†† Test reports available for indicated protocols. Consult Amphenol Aerospace.

### TV-R Series, MIL-DTL-38999 Series III\* Connectors

| QUADRAX CONTACTS FOR USE IN TV-R CONNECTORS                                                                         |                                                          |                             |                     |                             |                 |                                                                                    |                                                                         |                                                   |
|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------|---------------------|-----------------------------|-----------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------|
| Cable                                                                                                               | Contact Part Number<br>(Termination Instruction Sheet)** |                             | Impedance<br>(Ohms) | Inner<br>Conductor<br>(AWG) | Contact<br>Size | Electrical<br>Protocol††                                                           | Crimping Tools                                                          |                                                   |
|                                                                                                                     | Pin                                                      | Socket                      |                     |                             |                 |                                                                                    | Inner<br>Contact                                                        | Outer<br>Contact                                  |
| Tensolite 26473/02006X-4(LD) Same as 21-33384/5-31 but box pattern (not for new designs, use 21-33450/1 series)     | 21-33384-201†                                            | 21-33385-201†               | 150                 | 26                          | 8               | Fibre-Channel (1 GBPS, 2 GBPS, 1G/2G), 1000 Base-CX (1.25 GBPS), SCSI-2 (3.2 GBPS) | M22520/2-01 with Positioner M22520/2-37 or with Daniels Positioner K709 | M22520/5-01 with Die Set M22520/5-45 (Location A) |
| Tensolite 26473/02006X-4(LD), Gore RCN8328                                                                          | 21-33450-001<br>(L-2119-BW)                              | 21-33451-001<br>(L-2119-BW) |                     | 26                          |                 |                                                                                    |                                                                         |                                                   |
| Tensolite 26473/02006X-4(LD), Gore RCN8328 (same as 21-33450/1-1 except box pattern. Mates with 21-33450/1-11 only. | 21-33450-011†                                            | 21-33451-011†               |                     | 26                          |                 |                                                                                    |                                                                         |                                                   |

| PCB QUADRAX CONTACTS FOR USE IN TV-R CONNECTORS              |                     |              |                     |                 |
|--------------------------------------------------------------|---------------------|--------------|---------------------|-----------------|
| PCB Quadrax<br>Contacts                                      | Contact Part Number |              | Impedance<br>(Ohms) | Contact<br>Size |
|                                                              | Pin                 | Socket       |                     |                 |
| PCB (.1035 Length) Pre-tinned tails                          | 21-33398-21         | 21-33397-21  | 100                 | 8               |
| PCB (.866 Length)                                            | 21-33398-31         | 21-33397-31  | 100                 |                 |
| PCB Right Angle, inner contacts box pattern                  | 21-33425-1          |              | 100                 |                 |
| PCB (.494 Length) Pre-tinned tails                           | 21-33398-71         |              | 150                 |                 |
| PCB (1.194 Length) Pre-tinned tails                          | 21-33398-101        |              | 100                 |                 |
| PCB (.859 Length)                                            | 21-33398-121        |              | 100                 |                 |
| PCB (.741 Length)                                            | 21-33398-271†       |              | 100                 |                 |
| PCB (1.035 Length)                                           | 21-33398-291        | 21-33397-291 | 100                 |                 |
| PCB (.836 Length)                                            |                     | 21-33397-301 | 150                 |                 |
| PCB (1.035 Length) Pre-tinned tails                          | 21-33398-61         | 21-33397-61  | 150                 |                 |
| PCB (1.035 Length) mates to 21-33451 series                  | 21-33452-11†        |              | 150                 |                 |
| PCB (1.035 Length) mates to 21-33450 series                  |                     | 21-33453-11† | 150                 |                 |
| PCB (.815 Length) mates to 21-33451 series                   | 21-33452-21†        |              | 150                 |                 |
| PCB (.815 Length) mates to 21-33450 series                   |                     | 21-33453-21† | 150                 |                 |
| PCB (.815 Length) Pre-tinned tails, mates to 21-33451 series | 21-33452-31†        |              | 150                 |                 |
| PCB (.815 Length) Pre-tinned tails, mates to 21-33450 series |                     | 21-33453-31† | 150                 |                 |
| PCB .866 Length mates to 21-33451 series                     | 21-33452-41†        |              | 150                 |                 |
| PCB (.866 Length) mates to 21-33450 series                   |                     | 21-33453-41† | 150                 |                 |
| PCB (.494 Length) mates to 21-33451 series                   | 21-33452-51†        |              | 150                 |                 |
| PCB (.494 Length) mates to 21-33450 series                   |                     | 21-33453-51† | 150                 |                 |
| PCB (.840 Length) Pre-tinned tails                           | 21-33398-81         |              | 150                 |                 |
| PCB (.780 Length) Pre-tinned tails                           | 21-33398-131        |              | 150                 |                 |
| PCB (.840 Length) Pre-tinned tails                           | 21-33398-91         |              | 100                 |                 |
| PCB (.708 Length)                                            | 21-33398-111        |              | 100                 |                 |
| PCB (.605 Length)                                            | 21-33398-191        |              | 100                 |                 |
| PCB (.494 Length)                                            | 21-33398-231        |              | 100                 |                 |
| PCB (.741 Length)                                            | 21-33398-241        | 21-33397-241 | 100                 |                 |
| PCB (.806 Length)                                            | 21-33398-281        |              | 100                 |                 |
| PCB (.940 Length)                                            | 21-33398-311        |              | 100                 |                 |
| PCB (.939 Length)                                            | 21-33398-361        |              | 100                 |                 |
| PCB (.672 Length)                                            | 21-33398-371        |              | 100                 |                 |
| PCB (.914 Length)                                            | 21-33398-381        |              | 100                 |                 |
| PCB (.866 Length)                                            | 21-33398-411        |              | 100                 |                 |
| PCB (.901 Length)                                            |                     | 21-33397-341 | 100                 |                 |
| PCB (.871 Length)                                            |                     | 21-33397-351 | 100                 |                 |
| PCB (1.169 Length)                                           |                     | 21-33397-421 | 100                 |                 |

CONTACT ORDERING: Example number given in chart above 21-33384-201 should be ordered as 21-033384-201; example number given in chart at left 21-33398-21 should be ordered as 21-033398-021. Adding Zeros is necessary for Amphenol ordering process on all contact numbers

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

\* Requires modified connector to accommodate keyed contacts.

\*\*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)

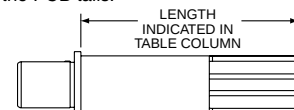
† Consult Amphenol Aerospace for current release of this contact or instruction sheet if applicable.

†† Test reports available for indicated protocols. Consult Amphenol Aerospace.

| SEALING PLUGS                                                                                  |              |
|------------------------------------------------------------------------------------------------|--------------|
| Sealing Plugs<br>for use with D38999 Connectors<br>using Quadrax Contacts -<br>Size 8 Cavities | Part Number  |
| Standard Plastic                                                                               | T3-4008-59P  |
| Standard Plastic to be used with<br>PCB tails (shorter tail length)                            | T3-4008-59P1 |
| Metal sealing plug - can be used<br>when mating with contacts on<br>mating half                | 21-33899-8Q1 |
| Metal sealing plug used with PCB's<br>and mating contact on mating half                        | 21-33899-8Q2 |

| PIGGYBACK GROMMET                                                   |             |
|---------------------------------------------------------------------|-------------|
| Grommet for use with D38999<br>Connectors<br>using Quadrax Contacts | Part Number |
| Metallized piggyback grommet                                        | 21-33321-23 |

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.

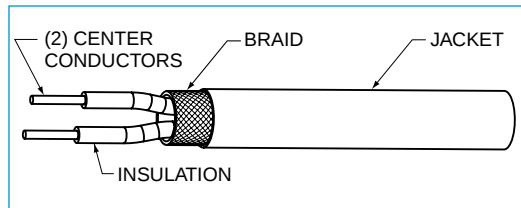


Note: it does not indicate stickout length when installed in D38999 connector.

### Amphenol® Differential Twinax Contacts -

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

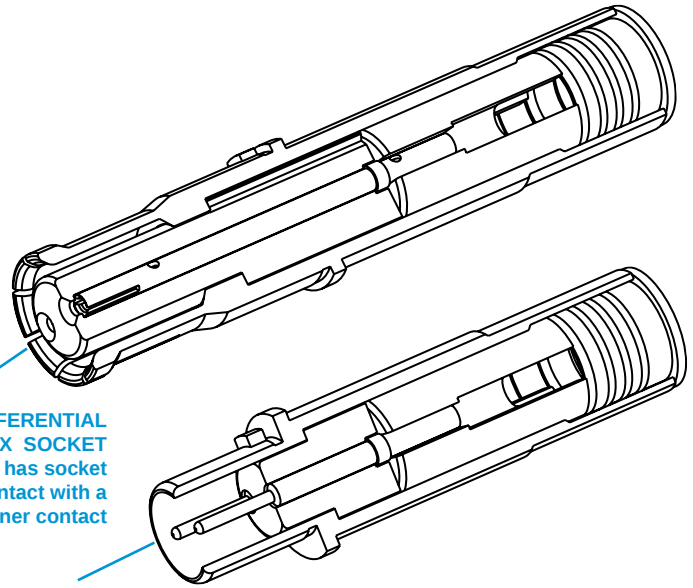
- Two strategically spaced inner contacts form two 100 or 150 Ohm matched impedance differential pairs
- Outer contact has rugged wall section for durability
- Available in size 8 crimp termination style
- Also available in size 8 with PC tails (see page 381)
- Requires modification of MIL-DTL-38999 connector to accommodate keyed contacts



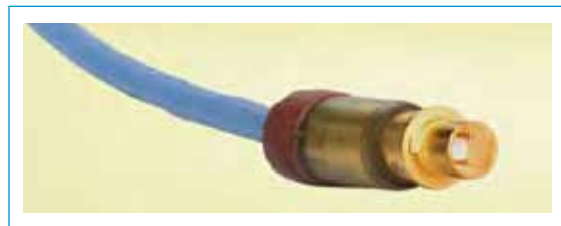
Cable Illustration - Differential Twinax Contact

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



Differential Twinax Socket Contact



Differential Twinax Pin Contact

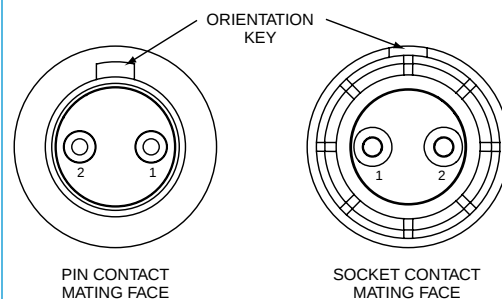
### Differential Twinax Contacts are Gold plated, Crimp Termination

Finish of mating contacts parts: supplied with 0.000050 min. gold over nickel on mating parts. Consult Amphenol for availability of other finishes.

### Differential Twinax Size 8 Contact Performance:

- Bandwidth: Up to 3 Gigahertz
- Data Rate: Exceeding 3 Gbits/sec.
- 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 for Differential Twinax Contacts



### TV-R Series, MIL-DTL-38999 Series III\* Connectors

| DIFFERENTIAL TWINAX CONTACTS FOR USE IN TV-R CONNECTORS                                                                                                                                                    |                                                          |                               |                     |                 |                                         |                                                                               |                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------|---------------------|-----------------|-----------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------|
| Cable                                                                                                                                                                                                      | Contact Part Number<br>(Termination Instruction Sheet)** |                               | Impedance<br>(Ohms) | Contact<br>Size | Electrical<br>Protocol††                | Crimping Tools                                                                |                                                      |
|                                                                                                                                                                                                            | Pin                                                      | Socket                        |                     |                 |                                         | Inner<br>Contact                                                              | Outer<br>Contact                                     |
| Tensolite 24463/05099X-8(LD), Thermax MX 100-24, Tensolite 24463/9P025X-2(LD), Thermax 12814, ST5M1284-003 (98 Ohm), 26463/70460X-2 (98 Ohm), PIC E10224, Fileca 2709-3, NF24T100-200C (Space), S280W502-1 | 21-33387-21<br>(L-2119-E)                                | 21-33388-21<br>(L-2119-E)     | 100                 | 8               | Ethernet, USB                           | M22520/2-01 with Positioner<br>M22520/2-37 or with Daniels<br>Positioner K709 | M22520/5-01 with Die Set<br>M22520/5-45 (Location A) |
| GORE GSC-05-827300-00                                                                                                                                                                                      | 21-33387-51***<br>(L-2119-AY)                            | 21-33388-51***<br>(L-2119-AY) |                     |                 |                                         |                                                                               |                                                      |
| Tensolite 26453/03184X-2(LD), Thermax 956-626Z, GORE GSC-05-827300-00                                                                                                                                      | 21-33387-41<br>(L-2119-T)                                | 21-33388-41<br>(L-2119-T)     |                     |                 |                                         |                                                                               |                                                      |
| 23460/05114X-2(LD), PIC E1024                                                                                                                                                                              | 21-33387-61<br>(L-2119-BH)                               | 21-33388-61<br>(L-2119-BH)    |                     |                 |                                         |                                                                               |                                                      |
| Raychem 0026A0024, M17/176-00002 (77 Ohm)                                                                                                                                                                  | 21-33387-71<br>(L-2119-BJ)                               | 21-33388-71<br>(L-2119-BJ)    |                     |                 |                                         |                                                                               |                                                      |
| JSFY11-24, Tensolite 24463/03220T-2(LD), Thermax 956-1T200                                                                                                                                                 | 21-33387-91<br>(L-2119-BT)                               | 21-33388-91<br>(L-2119-BT)    |                     |                 |                                         |                                                                               |                                                      |
| S280W502-6, Tensolite 24463/9P026X-2(LD)                                                                                                                                                                   | 21-33387-101<br>(L-2119-AK)                              | 21-33388-101<br>(L-2119-AK)   | 150                 |                 |                                         |                                                                               |                                                      |
| Tensolite 26483/03071X-2(LD)                                                                                                                                                                               | 21-33387-31<br>(L-2119-AC)                               | 21-33388-31<br>(L-2119-AC)    |                     |                 |                                         |                                                                               |                                                      |
| Tensolite 26483/03071X-2(LD)                                                                                                                                                                               | 21-33456-1<br>(L-2119-BX)†                               | 21-33457-1<br>(L-2119-BX)†    |                     |                 | Fibre Channel, 1000 Base-CX<br>Ethernet |                                                                               |                                                      |

| PCB DIFFERENTIAL TWINAX CONTACTS FOR USE IN TV-R CONNECTORS |                     |              |                     |                 |
|-------------------------------------------------------------|---------------------|--------------|---------------------|-----------------|
| PCB Quadrx<br>Contacts                                      | Contact Part Number |              | Impedance<br>(Ohms) | Contact<br>Size |
|                                                             | Pin                 | Socket       |                     |                 |
| PCB (1.035 Length)                                          | 21-33834-1          | 21-33835-1   | 100                 | 8               |
| PCB (.788 Length)                                           | 21-33834-31         | 21-33835-31  |                     |                 |
| PCB (.494 Length)                                           | 21-33834-41         | 21-33835-41  |                     |                 |
| PCB (.939 Length)                                           | 21-33834-51         | 21-33835-51  |                     |                 |
| PCB (.780 Length)                                           | 21-33834-61         | 21-33835-61  |                     |                 |
| PCB (.871 Length)                                           | 21-33834-71         | 21-33835-71  |                     |                 |
| PCB (.937 Length)                                           | 21-33834-81         | 21-33835-81  |                     |                 |
| PCB (1.035 Length)                                          | 21-33834-91         | 21-33835-91  |                     |                 |
| PCB (.843 Length)                                           | 21-33834-101        | 21-33835-101 |                     |                 |
| PCB (.806 Length)                                           | 21-33834-111        | 21-33835-111 |                     |                 |
| PCB (.908 Length)                                           | 21-33834-121        | 21-33835-121 |                     |                 |
| PCB (.530 Length)                                           | 21-33834-131        | 21-33835-131 |                     |                 |
| PCB (.819 Length)                                           | 21-33834-141        | 21-33835-141 | 150                 |                 |
| PCB (1.035 Length)                                          | 21-33834-21         | 21-33835-21  |                     |                 |
| PCB (1.035 Length) mates to 21-33456/57 series              | 21-33458-001        | 21-33457-001 |                     |                 |

#### 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 above 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.

CONTACT ORDERING: Example number given in chart above 21-33387-21 should be ordered as 21-033387-021; example number given in chart left 21-33834-1 should be ordered as 21-033834-001. Adding Zeros is necessary for Amphenol ordering process on all contact numbers. 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

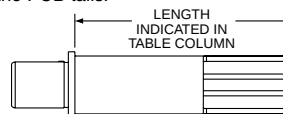
†† Test reports available for indicated protocols. Consult Amphenol Aerospace.

\*\*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.

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.

38999  
III  
II  
I  
SJT

26482  
Matrix 2

83723 III  
Matrix  
Pyle

5015  
Crimp Rear  
Release Matrix

26500 Pyle

Printed  
Circuit Board

EMI Filter  
Transient

Fiber Optics

High Speed  
Contacts

Options  
Others

#### Amphenol® Quadrax Contacts for Printed Circuit Board Attachment

Available for MIL-DTL-38999 Series III Circular connectors with straight PC tail termination and with compliant pin termination. These provide the ideal solution for bringing high speed data transmission to the board.



Compliant Pin Quadrax and PC Tail Quadrax Contacts



MIL-DTL-38999, SERIES III CONNECTOR WITH PC TAIL CONTACTS. This arrangement has 33 size 22D and 2 Quadrax PC tail contacts.

MIL-DTL-38999, SERIES III CONNECTOR WITH PC TAIL CONTACTS. This arrangement has 8 Quadrax PC tail contacts.

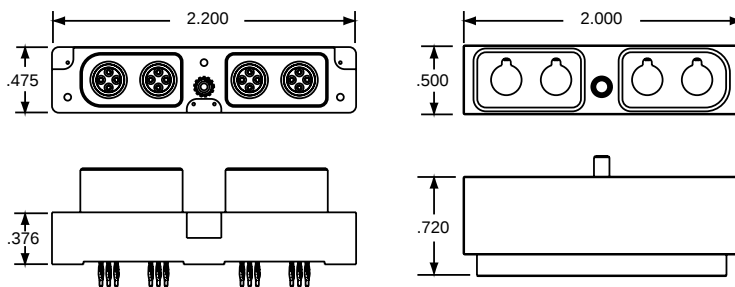


#### Amphenol® Quadrax Contacts for Rectangular Board Level Connectors

Incorporate the same size 8 Quadrax PCB contacts as used in circular 38999 connectors.

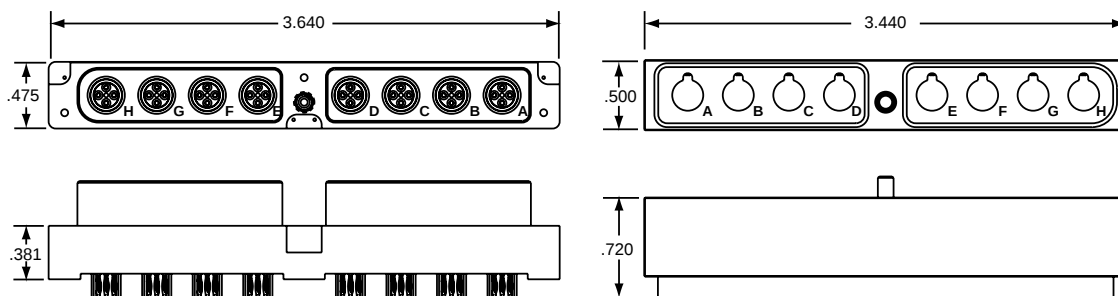
- Size 8 Quadrax Compliant contacts with hole diameters:  
 $.025 \pm .002$  PTH Quadrax contact  
 $.040 \pm .003$  PTH shell grounding  
 Accommodates backplane .125 inch min. thickness
- Consult Amphenol Aerospace for availability of additional connector configurations

##### 4 POSITION BOARD LEVEL CONNECTOR WITH QUADRIX



Compliant Pin Quadrax Board Level Connector

##### 8 POSITION BOARD LEVEL CONNECTOR WITH QUADRIX



# Quadrax Transition Adapters and Differential Twinax Transition Adapters

## General Description

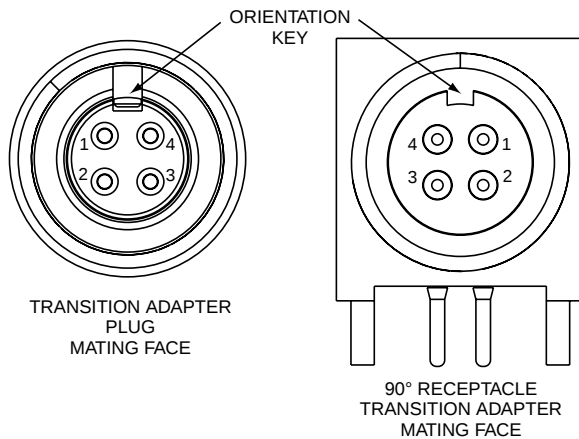
**Amphenol® Transition Adapters** - Are used to facilitate launching of controlled impedance signals to printed circuit boards. Amphenol provides transition adapters in both contact types:

- Quadrax transition adapters, 90° or straight receptacles threaded or cable to board style
- Differential twinax transition adapters, 90° or straight receptacles, threaded or cable to board style



90° Quadrax Receptacle and Plug Transition Adapter

### Suggested Numbering for Transition Adapters with Quadrax Contacts



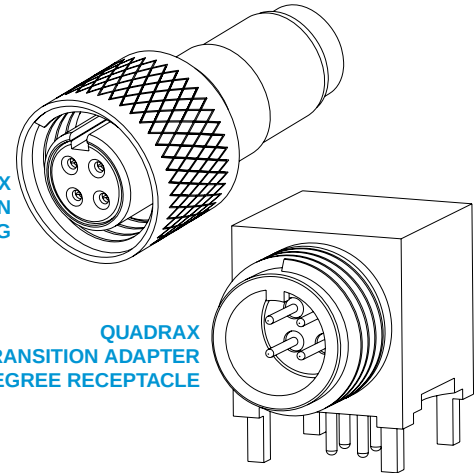
90° Differential Twinax Receptacle and Plug Transition Adapter

### 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.

QUADRAX  
TRANSITION  
ADAPTER PLUG

QUADRAX  
TRANSITION ADAPTER  
90 DEGREE RECEPTACLE



### ELECTRICAL PROTOCOLS FOR QUADRAX TRANSITION ADAPTERS

| Part Number  |                          | Impedance (Ohms) | Electrical Protocol††       |
|--------------|--------------------------|------------------|-----------------------------|
| Plug         | Receptacle               |                  |                             |
| 21-33836-31  |                          | 100              | Ethernet, gigabit Ether     |
| 21-33836-41  |                          |                  | Ethernet, gigabit Ether     |
| 21-33836-51  |                          |                  | Ethernet, gigabit Ether     |
| 21-33836-61  |                          |                  | Ethernet, gigabit Ether     |
|              | 21-33837-81 (90 degree)  |                  |                             |
|              | 21-33837-91 (90 degree)  |                  |                             |
|              | 21-33837-41 (90 degree)  |                  |                             |
|              | 21-33837-51 (straight)   |                  | Ethernet, gigabit Ether     |
|              | 21-33837-61 (90 degree)  | 150              |                             |
|              | 21-33837-141 (90 degree) |                  |                             |
| 21-33837-101 |                          |                  |                             |
| 21-33836-21  |                          |                  | 1000 Base CX, Fibre channel |
|              | 21-33837-21 (90 degree)  |                  |                             |
|              | 21-33837-211 (jam nut)   |                  | 1000 Base CX, Fibre channel |
|              | 21-33837-31 (straight)   |                  |                             |
|              | 21-33837-71 (90 degree)  |                  |                             |
| 21-33837-111 |                          |                  |                             |

### ELECTRICAL PROTOCOLS FOR DIFFERENTIAL TWINAX TRANSITION ADAPTERS

| Part Number   |                           | Impedance (Ohms) | Electrical Protocol†† |
|---------------|---------------------------|------------------|-----------------------|
| Plug          | Receptacle                |                  |                       |
| 21-33832-81   |                           | 100              |                       |
| 21-33832-21   |                           |                  | Ethernet              |
|               | 21-33833-21 (90 degree)   |                  |                       |
|               | 21-33833-31 (90 degree)   |                  | Ethernet              |
|               | 21-33833-151 (90 degree)  |                  |                       |
| 21-33832-111† |                           |                  |                       |
|               | 21-33833-161† (90 degree) |                  |                       |
|               | 21-33833-171† (90 degree) |                  |                       |
|               | 21-33833-91 (90 degree)   |                  |                       |
|               | 21-33833-51 (90 degree)   |                  |                       |
|               | 21-33833-141 (90 degree)  |                  |                       |
| 21-33832-91   |                           | 150              |                       |
|               | 21-33833-111 (90 degree)  |                  |                       |
|               | 21-33833-181† (90 degree) |                  |                       |
|               | 21-33833-101 (90 degree)  |                  |                       |

† Consult Amphenol Aerospace for current release of this adapter.

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

38999  
III II I SJT

26482  
Matrix 2

83723 III  
Matrix Pyle

5015  
Crimp Rear Release Matrix

26500 Pyle

Printed  
Circuit Board

EMI Filter  
Transient

Fiber Optics

High Speed  
Contacts

Options  
Others

### 100 OHM QUADRAX TRANSITION ADAPTERS FOR LAUNCHING CONTROLLED IMPEDANCE SIGNALS TO PC BOARDS

| Quadrax Type Adapter/<br>Cable or PCB Tail Length                                    | Illustration of Adapter | Part Number<br>(Termination Instruction Sheet)** |                              | Impedance<br>(Ohms) | Mating<br>Thread<br>Size | Crimping Tools                                                                            |                                                            |
|--------------------------------------------------------------------------------------|-------------------------|--------------------------------------------------|------------------------------|---------------------|--------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------|
|                                                                                      |                         | Plug                                             | Receptacle                   |                     |                          | Inner Contact                                                                             | Outer Contact                                              |
| Quadrax Plug Adapter/<br>Tensolite NF24Q100                                          |                         | 21-33836-31<br>(L-2119-U)                        |                              | 100                 | .375                     | M22520/2-01<br>with Positioner<br>M22520/2-37<br>or with<br>Daniels<br>Positioner<br>K709 | M22520/5-01<br>with Die Set<br>M22520/5-45<br>(Location A) |
| Quadrax Plug Adapter/<br>Tensolite NF22Q100,<br>NF22Q100-01, Thermax 956-5           |                         | 21-33836-41<br>(L-2119-W)†                       |                              |                     |                          |                                                                                           |                                                            |
| Quadrax Plug Adapter/<br>Draka Fileca F-4703-3,<br>F-4704-4                          |                         | 21-33836-51<br>(L-2119-Y)                        |                              |                     |                          |                                                                                           |                                                            |
| Quadrax Plug Adapter/<br>NF26Q100                                                    |                         | 21-33836-61<br>(L-2119-AM)†                      |                              |                     |                          |                                                                                           |                                                            |
| Quadrax Plug Adapter/<br>Hexnut with Lock Wire Holes<br>Tensolite NF24Q100           |                         | 21-33836-81                                      |                              |                     |                          | NA                                                                                        | NA                                                         |
| Quadrax Receptacle Straight<br>Adapter in-line jam nut<br>(threaded)/ GSC-10-8273900 |                         |                                                  | 21-33837-81<br>(L-2119-AR)†  |                     |                          |                                                                                           |                                                            |
| Quadrax Receptacle Straight<br>Adapter in-line (threaded)/<br>NF24Q100               |                         |                                                  | 21-33837-91<br>(L-2119-BL)   |                     |                          |                                                                                           |                                                            |
| PCB Quadrax Receptacle 90<br>Degree Adapter/<br>Tail Length .110                     |                         |                                                  | 21-33837-41                  |                     |                          |                                                                                           |                                                            |
| PCB Quadrax Receptacle 90<br>Degree Adapter/<br>Tail Length .200                     |                         |                                                  | 21-33837-201                 |                     |                          |                                                                                           |                                                            |
| PCB Quadrax Receptacle<br>Straight Adapter/<br>Tail Length .110                      |                         |                                                  | 21-33837-51                  |                     |                          |                                                                                           |                                                            |
| PCB Quadrax Receptacle<br>Straight Adapter/<br>Special Tail Length (.200)            |                         |                                                  | 21-33837-61                  |                     |                          |                                                                                           |                                                            |
| Quadrax Receptacle 90<br>degree Adapter with cable to<br>board/<br>NF24Q100          |                         |                                                  | 21-33837-141<br>(L-2119-BB)† | 100                 |                          | M22520/2-01<br>with Positioner<br>M22520/2-37<br>or with<br>Daniels<br>Positioner<br>K709 | M22520/5-01<br>with Die Set<br>M22520/5-45<br>(Location A) |
| Quadrax Receptacle 90<br>degree Adapter with cable to<br>board/<br>ABS1503KD24       |                         |                                                  | 21-33837-231                 |                     |                          |                                                                                           |                                                            |
| Quadrax Receptacle Straight<br>Adapter<br>with cable to board/<br>NF24Q100           |                         |                                                  | 21-33837-101<br>(L-2119-AN)  |                     |                          |                                                                                           |                                                            |

CONTACT ORDERING: Example number given in chart 21-33837-81 should be ordered as 21-033837-081; example number 21-33837-101 should be ordered as 21-033837-101. Adding Zeros is necessary for Amphenol ordering process on all contact numbers.  
Daniels crimping tools are available from Daniels Mfg. Corp. 6103 Anno Ave., Orlando, FL 32809

\*\*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 adapter and instruction sheet if applicable.  
See electrical protocols for transition adapters on page 383.

38999

SJT

Matrix 2

83723 III  
Matrix Pyle

5015  
Crimp Rear  
Release Matrix

26500 Pyle

Printed  
Circuit Board

EMI Filter  
Transient

Fiber Optics

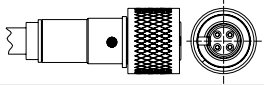
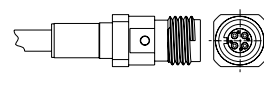
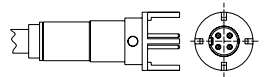
High Speed  
Contacts

Options  
Others

# Quadrax Transition Adapters

For Attachment to PC Boards

## Application Data

| 150 OHM QUADRAX TRANSITION ADAPTERS<br>FOR LAUNCHING CONTROLLED IMPEDANCE SIGNALS TO PC BOARDS                         |                                                                                   |                                                                                   |                                 |                     |                          |                                               |                                                            |  |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------|---------------------|--------------------------|-----------------------------------------------|------------------------------------------------------------|--|
| Quadrax Type Adapter/<br>Cable or PCB Tail Length                                                                      | Illustration of Adapter                                                           | Part Number<br>(Termination Instruction Sheet)**                                  |                                 | Impedance<br>(Ohms) | Mating<br>Thread<br>Size | Crimping Tools                                |                                                            |  |
|                                                                                                                        |                                                                                   | Plug                                                                              | Receptacle                      |                     |                          | Inner Contact                                 | Outer Contact                                              |  |
| Quadrax Plug Adapter/<br>Tensolite 26473/02006X-4(LD),<br>Gore RCN8328                                                 |  | 21-33836-21<br>(L-2119-S)                                                         |                                 | 150                 | .375                     | M22520/2-01<br>with Positioner<br>M22520/2-34 | NA                                                         |  |
| PCB Quadrax Receptacle 90<br>Degree Adapter/<br>Tail Length .110                                                       |                                                                                   |                                                                                   | 21-33837-21                     |                     |                          | NA                                            |                                                            |  |
| PCB Quadrax Receptacle<br>Straight Adapter/<br>Tail Length .110                                                        |                                                                                   |  | 21-33837-31                     |                     |                          |                                               |                                                            |  |
| Quadrax Receptacle Straight<br>Adapter in-line Jam Nut<br>(threaded) Tensolite<br>26473/02006X-4 (LD), Gore<br>RCN8328 |  |                                                                                   | 21-33837-211<br>(L-2119-BY)     | 150                 |                          | M22520/2-01<br>with Positioner<br>M22520/2-34 | M22520/5-01<br>with Die Set<br>M22520/5-45<br>(Location A) |  |
| Quadrax Receptacle 90<br>degree Adapter with cable to<br>board/<br>Tensolite 26473/02006X-4                            |                                                                                   |                                                                                   | 21-33837-71<br>(L-2119-AI)†     |                     |                          |                                               |                                                            |  |
| Quadrax Receptacle Straight<br>Adapter<br>with cable to board/<br>Tensolite 26473/02006X-4 (LD)                        |                                                                                   |  | 21-33837-<br>111<br>(L-2119-AP) |                     |                          |                                               |                                                            |  |

**CONTACT ORDERING:** Example number given in chart 21-33837-81 should be ordered as 21-033837-081; example number 21-33837-101 should be ordered as 21-033837-101. Adding Zeros is necessary for Amphenol ordering process on all contact numbers. Daniels crimping tools are available from Daniels Mfg. Corp. 6103 Anno Ave., Orlando, FL 32809

\*\*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 adapter and instruction sheet if applicable.

See electrical protocols for transition adapters on page 383.

38999  
III  
II  
I  
SJT

26482  
Matrix 2

83723 III  
Matrix  
Pyle

5015  
Crimp Rear  
Release Matrix

26500 Pyle

Printed  
Circuit Board

EMI Filter  
Transient

Fiber Optics

High Speed  
Contacts

Options  
Others

| 100 OHM DIFFERENTIAL TWINAX TRANSITION ADAPTERS<br>FOR LAUNCHING CONTROLLED IMPEDANCE SIGNALS TO PC BOARDS |              |                          |                                                  |                                                                                                                       |                     |                          |                              |               |     |       |                                                  |                                                            |                             |  |
|------------------------------------------------------------------------------------------------------------|--------------|--------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------|--------------------------|------------------------------|---------------|-----|-------|--------------------------------------------------|------------------------------------------------------------|-----------------------------|--|
| Differential Twinax Type Adapter/<br>Cable or PCB Tail Length                                              |              | Illustration of Adapter  | Part Number<br>(Termination Instruction Sheet)** |                                                                                                                       | Impedance<br>(Ohms) | Mating<br>Thread<br>Size | Crimping Tools               |               |     |       |                                                  |                                                            |                             |  |
|                                                                                                            |              |                          | Plug                                             | Receptacle                                                                                                            |                     |                          | Inner Contact                | Outer Contact |     |       |                                                  |                                                            |                             |  |
| 38999<br>SJT                                                                                               | Matrix 2     | Pyle                     | Mating plugs and receptacles                     | Differential Twinax Plug Adapter/<br>M17/176-00002 (77 ohms)                                                          |                     |                          | 21-33832-81<br>(L-2119-AJ)   |               | 100 | .3125 | M22520/2-01<br>with<br>Positioner<br>M22520/2-34 | M22520/5-01<br>with Die Set<br>M22520/5-05<br>(Location B) |                             |  |
|                                                                                                            |              |                          |                                                  | Differential Twinax Plug Adapter/<br>Tensolite 24463/9P025X-2(LD)<br>10-646060                                        |                     |                          |                              |               |     |       |                                                  |                                                            | 21-33832-21<br>(L-2119-P)   |  |
|                                                                                                            |              |                          |                                                  | PCB Differential Twinax<br>Receptacle 90 Degree Adapter/<br>Tail Length .110                                          |                     |                          | 21-33833-21                  |               |     |       | N/A                                              | N/A                                                        |                             |  |
|                                                                                                            |              |                          |                                                  | PCB Differential Twinax<br>Receptacle Straight Adapter/<br>Tail Length .110                                           |                     |                          | 21-33833-31                  |               |     |       |                                                  |                                                            |                             |  |
|                                                                                                            |              |                          |                                                  | PCB Differential Twinax<br>Receptacle Straight Adapter/<br>Tail Length .165                                           |                     |                          | 21-33833-151                 |               |     |       |                                                  |                                                            |                             |  |
| 5015<br>Crimp Rear<br>Release Matrix                                                                       | 26500 Pyle   | Printed<br>Circuit Board | Mating plugs and receptacles                     | Differential Twinax Plug Adapter/Tensolite<br>CAN22TDT120 (120 Ohm)                                                   |                     |                          | 21-33832-111†                |               | 100 | .375  | M22520/2-01<br>with<br>Positioner<br>M22520/2-34 | M22520/5-01<br>with Die Set<br>M22520/5-45<br>(Location A) |                             |  |
|                                                                                                            |              |                          |                                                  | PCB Differential Twinax<br>Receptacle 90 degree Adapter/<br>Tail Length .283                                          |                     |                          |                              |               |     |       |                                                  |                                                            |                             |  |
|                                                                                                            |              |                          |                                                  | PCB Differential Twinax<br>Receptacle Straight Adapter/<br>Tail Length .283                                           |                     |                          | 21-33833-171†                |               |     |       |                                                  |                                                            |                             |  |
| EMI Filter<br>Transient                                                                                    | Fiber Optics | High Speed<br>Contacts   | Wired to board                                   | Differential Twinax Receptacle<br>90 degree Adapter (low profile)<br>with cable to board/ Tensolite<br>24463/9P026X-2 |                     |                          | 21-33833-91<br>(L-2119-AF)   |               | 100 | N/A   | M22520/2-01<br>with<br>Positioner<br>M22520/2-34 | M22520/5-01<br>with Die Set<br>M22520/5-45<br>(Location A) |                             |  |
|                                                                                                            |              |                          |                                                  | Differential Twinax Receptacle<br>90 degree Adapter with cable to<br>board/<br>Tensolite 24463/9P025X-2               |                     |                          |                              |               |     |       |                                                  |                                                            | 21-33833-51<br>(L-2119-V)   |  |
|                                                                                                            |              |                          |                                                  | Differential Twinax Receptacle<br>90 degree Adapter with cable to<br>board/Tensolite<br>24463/9P025X-2                |                     |                          |                              |               |     |       |                                                  |                                                            | 21-33833-141<br>(L-2119-BU) |  |
| 150 OHM DIFFERENTIAL TWINAX TRANSITION ADAPTERS<br>FOR LAUNCHING CONTROLLED IMPEDANCE SIGNALS TO PC BOARDS |              |                          |                                                  |                                                                                                                       |                     |                          |                              |               |     |       |                                                  |                                                            |                             |  |
| Differential Twinax Type Adapter/<br>Cable or PCB Tail Length                                              |              | Illustration of Adapter  | Part Number<br>(Termination Instruction Sheet)** |                                                                                                                       | Impedance<br>(Ohms) | Mating<br>Thread<br>Size | Crimping Tools               |               |     |       |                                                  |                                                            |                             |  |
|                                                                                                            |              |                          | Plug                                             | Receptacle                                                                                                            |                     |                          | Inner Contact                | Outer Contact |     |       |                                                  |                                                            |                             |  |
| 26482<br>Matrix 2                                                                                          | SJT          | Pyle                     | Mating plugs and receptacles                     | Differential Twinax Plug Adapter/<br>Tensolite 26483/03071X-2                                                         |                     |                          | 21-33832-91<br>(L-2119-BR)   |               | 150 | .375  | M22520/2-01<br>with<br>Positioner<br>M22520/2-34 | M22520/5-01<br>with Die Set<br>M22520/5-45<br>(Location A) |                             |  |
|                                                                                                            |              |                          |                                                  | PCB Differential Twinax<br>Receptacle 90 Degree Adapter/<br>Tail Length .110                                          |                     |                          |                              |               |     |       |                                                  |                                                            |                             |  |
|                                                                                                            |              |                          |                                                  | PCB Differential Twinax<br>Receptacle Straight Adapter/<br>Tail Length .110                                           |                     |                          | 21-33833-181†                |               |     |       | N/A                                              | N/A                                                        |                             |  |
| Options<br>Others                                                                                          | Fiber Optics | High Speed<br>Contacts   | Wired to board                                   | Differential Twinax Receptacle<br>90 degree Adapter with cable to<br>board/<br>Tensolite 26483/03071X-2               |                     |                          | 21-33833-101<br>(L-2119-BM)† |               | 150 | N/A   | M22520/2-01<br>with<br>Positioner<br>M22520/2-34 | M22520/5-01<br>with Die Set<br>M22520/5-45<br>(Location A) |                             |  |
|                                                                                                            |              |                          |                                                  |                                                                                                                       |                     |                          |                              |               |     |       |                                                  |                                                            |                             |  |

CONTACT ORDERING: Example number given in chart 21-33832-21 should be ordered as 21-033832-021; example number 21-338373-141 should be ordered as 21-033833-141. Adding Zeros is necessary for Amphenol ordering process on all contact numbers.

\*\*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 adapter and instruction sheet if applicable. See electrical protocols for transition adapters on page 383.

# Insert Arrangements - MIL-DTL-38999, Series III

## Incorporating Quadrax & Differential Twinax Contacts



This illustrated listing represents the most readily available patterns incorporating quadrax and differential twinax contacts within D38999, Series III connectors. If you require other arrangements than what are shown here, consult Amphenol for further availability. In most cases, unless otherwise stated, size 8 cavities can be filled with quadrax or differential twinax contacts. Arrangements can be mixed with any size 8 coax, and/or concentric twinax or triax contacts.

Front face of pin inserts illustrated

| Insert Arrangement | 9-5      | 17-2 | 17-22    | 17-52                      | 17-60 |
|--------------------|----------|------|----------|----------------------------|-------|
| Number of Contacts | 1        | 38   | 2 2      | 2                          | 8 2   |
| Contact Size       | 8        | 22D  | 8 Twinax | 8                          | 22D   |
|                    | Grounded |      |          | Meets Boeing Specification |       |

| Insert Arrangement | 19-18 | 19-31    | 19-AD | 21-75 |
|--------------------|-------|----------|-------|-------|
| Number of Contacts | 14 4  | 12 1 2   | 16 1  | 4     |
| Contact Size       | 22D 8 | 22D 12 8 | 20 8  | 8     |

| Insert Arrangement | 21-79 | 23-6 | 25-7  |
|--------------------|-------|------|-------|
| Number of Contacts | 17 2  | 6    | 97 2  |
| Contact Size       | 22D 8 | 8    | 22D 8 |

CONTACT LEGEND

8  
Quadrax or  
Differential Twinax

10

12

16

20

22D

III

38999

II

I

SJT

26482

Matrix 2

83723 III

Matrix

Pyle

5015

Crimp Rear

Release Matrix

26500 Pyle

Printed

Circuit Board

EMI Filter

Transient

Fiber Optics

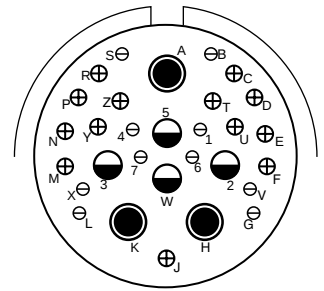
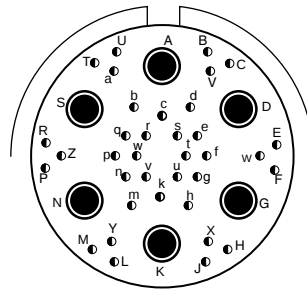
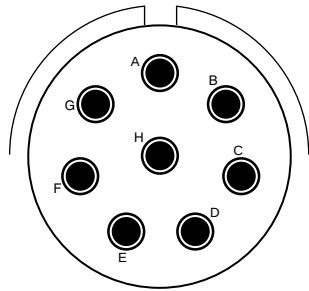
High Speed

Contacts

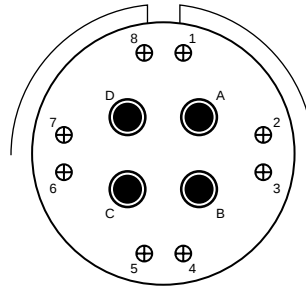
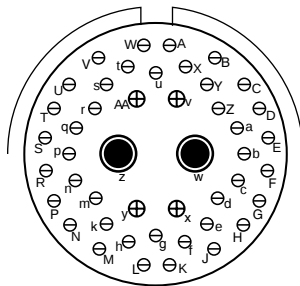
Options

Others

Front face of pin inserts illustrated



| Insert Arrangement | 25-8 |  |  | 25-17 |   |  |  | 25-20 |    |   |    |
|--------------------|------|--|--|-------|---|--|--|-------|----|---|----|
| Number of Contacts | 8    |  |  | 36    | 6 |  |  | 10    | 13 | 3 | 4  |
| Contact Size       | 8    |  |  | 22D   | 8 |  |  | 20    | 16 | 8 | 12 |



| Insert Arrangement | 25-46 |    |   | 25-62             |   |
|--------------------|-------|----|---|-------------------|---|
| Number of Contacts | 40    | 4  | 2 | 8                 | 4 |
| Contact Size       | 20    | 16 | 8 | 16                | 8 |
|                    |       |    |   | Ground plane only |   |

#### CONTACT LEGEND



8



10



12



16



20



22D

Quadrax or  
Differential Twinax

# How to Order 38999, Series III Circular With Quadrax 100 Ohm Contacts

Amphenol Tri-Start, 38999 Series III\* Connectors can be ordered with the following popularly used Quadrax contacts:  
100 ohm quadrax 21-033385-051 socket contacts  
100 ohm quadrax 21-033384-051 pin contacts  
Use the following coded number ordering procedure :

| 1.             | 2.         | 3.            | 4.                              | 5.           | 6.                        |
|----------------|------------|---------------|---------------------------------|--------------|---------------------------|
| Connector Type | Shell Type | Service Class | Shell Size – Insert Arrangement | Contact Type | Alternate Keying Position |
| <b>TVP</b>     | <b>00</b>  | <b>RQW</b>    | <b>21-75</b>                    | <b>P</b>     | <b>B</b>                  |

For ordering of connectors with any other quadrax contacts or differential twinax contacts, please consult Amphenol Aerospace for part numbers.

## Step 1. Select a Connector Type

|             |                                                     |
|-------------|-----------------------------------------------------|
| <b>TV</b>   | Tri-Start Series Connector with metal shells        |
| <b>TVP</b>  | Back panel mounted receptacle with metal shells     |
| <b>CTV</b>  | Tri-Start Series Connector with composite shells    |
| <b>CTVP</b> | Back panel mounted receptacle with composite shells |

## Step 2. Select a Shell Style

|           |                                                                                             |
|-----------|---------------------------------------------------------------------------------------------|
| <b>00</b> | Wall mount receptacle                                                                       |
| <b>02</b> | Box mount receptacle available only with the PCB tails and epoxy backfilled (non-removable) |
| <b>06</b> | Straight plug                                                                               |
| <b>07</b> | Jam nut receptacle                                                                          |

## Step 3. Select a Service Class with Quadrax

|             |                                                     |
|-------------|-----------------------------------------------------|
| <b>RQF</b>  | Electroless nickel plated aluminum                  |
| <b>RGQF</b> | Electroless nickel plated ground plane aluminum     |
| <b>RQW</b>  | Olive drab cadmium plate                            |
| <b>RGQW</b> | Olive drab cadmium plated ground plane aluminum     |
| <b>RQB</b>  | NiAlBronze                                          |
| <b>RGQB</b> | NiAlBronze ground plane                             |
| <b>RQK</b>  | Corrosion resistance stainless steel                |
| <b>RGQK</b> | Stainless steel ground plane                        |
| <b>QDT</b>  | Durmalon plated, Nickel-PTFE alternative to cadmium |
| <b>GQDT</b> | Groundplane Durmalon                                |

## Step 4. Select a Shell Size and Insert Arrangement

See insert arrangements available with quadrax contacts on preceding pages. Shell Size and Insert Arrangements are together in one chart. First number represents Shell Size, second number is the Insert Arrangement

## Step 5. Select Contact Type

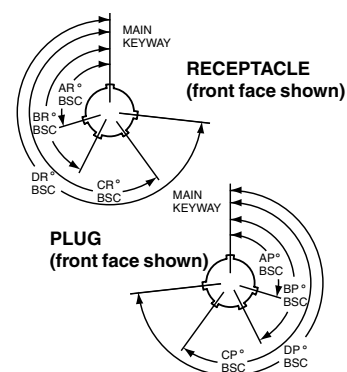
|          |                 |
|----------|-----------------|
| <b>P</b> | Pin contacts    |
| <b>S</b> | Socket contacts |

## Step 6. Select an Alternate Keying Position

Locksmith keying—rotation of minor keys. See Series III Alternate Positions below “N” not required for normal position

### Tri-Start Alternate Positions

A plug with a given rotation letter will mate with a receptacle with the same rotation letter. The angles for a given connector are the same whether it contains pins or sockets. Inserts are not rotated in conjunction with the master key/keyway.



| Shell Size      | Key & Keyway Arrangement Identification Letter | AR <sup>o</sup> or AP <sup>o</sup> BSC | BR <sup>o</sup> or BP <sup>o</sup> BSC | CR <sup>o</sup> or CP <sup>o</sup> BSC | DR <sup>o</sup> or DP <sup>o</sup> BSC |
|-----------------|------------------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
| 9               | N                                              | 105                                    | 140                                    | 215                                    | 265                                    |
|                 | A                                              | 102                                    | 132                                    | 248                                    | 320                                    |
|                 | B                                              | 80                                     | 118                                    | 230                                    | 312                                    |
|                 | C                                              | 35                                     | 140                                    | 205                                    | 275                                    |
|                 | D                                              | 64                                     | 155                                    | 234                                    | 304                                    |
| 11, 13, and 15  | E                                              | 91                                     | 131                                    | 197                                    | 240                                    |
|                 | N                                              | 95                                     | 141                                    | 208                                    | 236                                    |
|                 | A                                              | 113                                    | 156                                    | 182                                    | 292                                    |
|                 | B                                              | 90                                     | 145                                    | 195                                    | 252                                    |
|                 | C                                              | 53                                     | 156                                    | 220                                    | 255                                    |
| 17 and 19       | D                                              | 119                                    | 146                                    | 176                                    | 298                                    |
|                 | E                                              | 51                                     | 141                                    | 184                                    | 242                                    |
|                 | N                                              | 80                                     | 142                                    | 196                                    | 293                                    |
|                 | A                                              | 135                                    | 170                                    | 200                                    | 310                                    |
|                 | B                                              | 49                                     | 169                                    | 200                                    | 244                                    |
| 21, 23, and 25  | C                                              | 66                                     | 140                                    | 200                                    | 257                                    |
|                 | D                                              | 62                                     | 145                                    | 180                                    | 280                                    |
|                 | E                                              | 79                                     | 153                                    | 197                                    | 272                                    |
|                 | N                                              | 80                                     | 142                                    | 196                                    | 293                                    |
|                 | A                                              | 135                                    | 170                                    | 200                                    | 310                                    |
| 25L, 33, and 37 | B                                              | 49                                     | 169                                    | 200                                    | 244                                    |
|                 | C                                              | 66                                     | 140                                    | 188                                    | 257                                    |
|                 | D                                              | 62                                     | 145                                    | 188                                    | 280                                    |
|                 | E                                              | 79                                     | 153                                    | 188                                    | 272                                    |
|                 | N                                              | 80                                     | 142                                    | 188                                    | 293                                    |

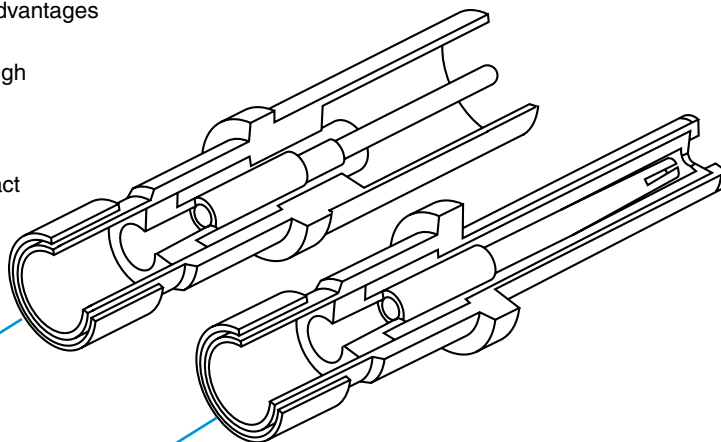
\* The incorporation of quadrax or differential twinax contacts requires a modified connector to accommodate keyed contacts.

For more information on Tri-Start, MIL-DTL-38999 Series III connectors see the section in this catalog.

|                           |                      |
|---------------------------|----------------------|
| III                       | 38999                |
| II                        |                      |
| I                         |                      |
| SJT                       |                      |
| Matrix 2                  | 26482                |
| Matrix                    | 83723 III            |
| Pyle                      | 5015                 |
| Crimp Rear Release Matrix | 26500 Pyle           |
| Printed Circuit Board     | EM1 Filter Transient |
| Fiber Optics              | High Speed Contacts  |
| Options Others            |                      |

**Amphenol® Coaxial Contacts** - Offer several advantages for reliable interconnection and continued performance:

- Large crimping area assures low contact resistance and high tensile strength
- Back insulator positively captivates inner contact against axial loads
- Front insulator provides closed entry for socket inner contact
- Recessed inner contact is protected
- Outer contact has rugged wall section for durability



TYPICAL SUBMINIATURE COAX  
SOCKET CONTACT has socket outer  
contact with a pin inner contact

TYPICAL SUBMINIATURE COAX  
PIN CONTACT has pin outer con-  
tact with a socket inner contact



MIL-DTL-38999 LJT-R, JT-R, TV-R, SJT-R MS Type,  
Coax Size 12 Socket Assembled Contact



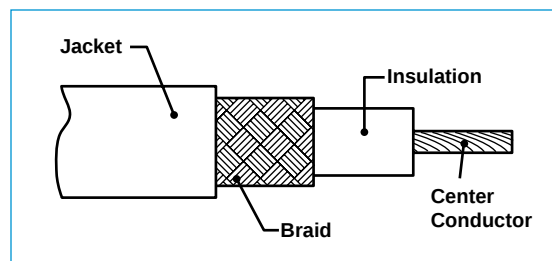
MIL-DTL-38999 LJT-R, JT-R, TV-R, SJT-R MS Type,  
Coax Size 16 Pin Unassembled Contact



MIL-DTL-38999 LJT-R, JT-R, TV-R, SJT-R MS Type,  
Coax Size 8 Pin Assembled Contact



MIL-DTL-38999 LJT-R, JT-R, TV-R, SJT-R MS Type,  
Coax Size 8 Socket Unassembled Contact



Cable Illustration - Coax Contact

#### Coax Contacts are gold plated, crimp termination

Finish of mating contacts parts: supplied with 0.000050 min. gold over nickel on mating parts. Other finishes are available; consult Amphenol for further information.

#### Coax Size 12 & 16 Contact Performance:

- Typical VSWR: 1.5:1 maximum up to 700 MHz and 500 MHz respectively, for properly cabled size 12 and 16 coaxial contacts in the M38999 Series I, II and III
- Insulation Resistance: 5,000 megohms minimum @ 25°C
- Dielectric Withstanding Voltage:  
Size 12: 1,000 VAC Rms @ sea level, 250 VAC Rms @ 50,000 ft.  
Size 16: 800 VAC Rms @ sea level, 250 VAC Rms @ 50,000 ft.
- Contact Resistance: See MIL-C-39029/27, /28, /75, /76, /77, /78

#### Coax Size 8 Contact Performance:

- Typical VSWR when terminated to specified 50 ohm cable:  
1.5:1 maximum up to 3 GHz (excluding 21-33101/2-27)
- Insulation Resistance: 5,000 megohms minimum @ 25°C
- Dielectric Withstanding Voltage:  
1,300 VAC Rms @ sea level, 250 VAC Rms @ 50,000 ft.
- Contact Resistance: See MIL-C-39029/59, /60

# Coaxial Contacts for MIL-DTL-38999

## Application Data



### JT-R Series, MIL-DTL-38999 Series II, SAE AS39029 (27, 28, 76, 78)

| COAX CONTACTS FOR USE IN JT-R CONNECTORS                                                                                               |                                                          |                                                |              |                                                                                        |                                                                                                              |                                                                              |                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------|--------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Cable                                                                                                                                  | Contact Part Number<br>(Termination Instruction Sheet)** |                                                | Contact Size | Crimping Tools                                                                         |                                                                                                              | Installation Tools                                                           |                                                                              |
|                                                                                                                                        | Pin                                                      | Socket                                         |              | Inner Contact                                                                          | Crimp Ferrule                                                                                                | Insertion                                                                    | Removal                                                                      |
| RG-178B/U, RG-196A/U                                                                                                                   | 21-33122-564<br>(M39029/76-425)<br>(L-2035-AG)           | 21-33121-564<br>(M39029/78-433)<br>(L-2035-AH) | 16           | M22520/2-01<br>with Positioner<br>M22520/2-35<br>or with<br>Daniels Positioner<br>K532 | M22520/4-01<br>with Positioner<br>M22520/4-02                                                                | M81969/8-07<br>or<br>M81969/14-03                                            | M81969/8-08<br>or<br>M81969/14-03                                            |
| Haveg<br>30-00761, 30-02024,<br>30-02033<br>Tensolite<br>24713/A955KK1, 26723/<br>A955KK1                                              | 21-33122-562†<br>(L-2035-AN)                             | 21-33121-562†<br>(L-2035-AP)                   |              |                                                                                        |                                                                                                              | Amphenol<br>11-8674-16<br>11-8794-16<br>or<br>MS27495A16<br>or<br>MS27534-16 | Amphenol<br>11-8675-16<br>11-8795-16<br>or<br>MS27495R16<br>or<br>MS27534-16 |
| Haveg 61-02051                                                                                                                         | 21-33122-561†<br>(L-2035-AK)                             | 21-33121-561†<br>(L-2035-AL)                   |              |                                                                                        |                                                                                                              |                                                                              |                                                                              |
| RG-174A/U, RG-188A/U,<br>RG-161/U,<br>RG-187A/U, RG-316/U,<br>RG-179B/U,<br>Haveg 8100207, Times<br>(HS-179)<br>AA3248, Teledyne 11299 | 21-33122-563<br>(M39029/76-424)<br>(L-2035-AD)           | 21-33121-563<br>(M39029/78-432)<br>(L-2035-AE) |              |                                                                                        |                                                                                                              |                                                                              |                                                                              |
|                                                                                                                                        | 21-33122-546<br>(M39029/28-211)<br>(L-2035-F)            | 21-33121-546<br>(M39029/27-210)<br>(L-2035-G)  | 12           | M22520/2-01<br>with Positioner<br>M22520/2-34<br>or with<br>Daniels Positioner<br>K323 | M22520/31-01<br>with Positioner<br>M22520/31-02<br>or<br>Daniels GS-200<br>Tool<br>with Positioner<br>G2P330 | M81969/8-09<br>or<br>M81969/14-04                                            | M81969/8-10<br>or<br>M81969/14-04                                            |
| RG-180B/U, RG-195A/U,<br>Raychem 9528A1318                                                                                             | 21-33122-541<br>(M39029/28-409)<br>(L-2035-C)            | 21-33121-541<br>(M39029/27-402)<br>(L-2035-E)  |              |                                                                                        |                                                                                                              | Amphenol<br>11-8674-12<br>11-8794-12<br>or<br>MS27495A12<br>or<br>MS27534-12 | Amphenol<br>11-8675-12<br>11-8795-12<br>or<br>MS27495R12<br>or<br>MS27534-12 |
| Raychem 5022E5111                                                                                                                      | 21-33122-543†<br>(L-2035-M)                              | 21-33121-543†<br>(L-2035-N)                    |              |                                                                                        |                                                                                                              |                                                                              |                                                                              |
| Raychem 9530A5314                                                                                                                      | 21-33122-544<br>(L-2035-R)                               | 21-33121-544<br>(L-2035-S)                     |              |                                                                                        |                                                                                                              |                                                                              |                                                                              |
| Raychem 9527A1318                                                                                                                      | 21-33122-545<br>(L-2035-U)                               | 21-33121-545<br>(L-2035-V)                     |              |                                                                                        |                                                                                                              |                                                                              |                                                                              |
| Gore GWN1159A                                                                                                                          | 21-33122-547†<br>(L-2035-X)                              | 21-33121-547†<br>(L-2035-Y)                    |              |                                                                                        |                                                                                                              |                                                                              |                                                                              |

### MIL-DTL-38999 CONTACT DATA

All contacts mate with other contacts in this series which have the same inner and outer contact diameters.

CONTACT ORDERING: Example number given in chart 21-33122-564 should be ordered as 21-033122-564.

Adding Zeros is necessary for Amphenol ordering process on all contact numbers

† Consult Amphenol Aerospace for current release of this contact or instruction sheet if applicable.

NOTE: SAE AS39029 supersedes MIL-C-39029

\*\*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)

|                                         |                                                                                                                                             |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| JT Example:                             | Socket 21-33121-564 on RG-196A/U cable will mate with pin 21-33122-563 on RG-188A/U cable which is used in both this and the LJ-T-R series. |
| LJT, TV, SJT,<br>Amphe-Lite<br>Example: | Socket 21-33123-564 on RG-196A/U cable will mate with pin 21-33122-563 on RG-188A/U cable which is used in both this and the JT-R series.   |

Finish of mating contact parts: Contact part numbers shown in the chart above are supplied with 0.000050 min. gold (Knoop hardness 130-200) over nickel on mating parts. Other finishes are available; consult Amphenol.

Daniels crimping tools are available from:

Daniels Mfg. Corp. 6103 Anno Ave., Orlando FL 32809

38999  
III  
II  
I  
SJT

26482  
Matrix 2

83723 III  
Matrix  
Pyle

5015  
Crimp Rear  
Release Matrix

26500 Pyle

Printed  
Circuit Board

EMI Filter  
Transient

Fiber Optics

High Speed  
Contacts

Options  
Others

### LJT-R, MIL-DTL-38999 Series I; TV-R, MIL-DTL-38999 Series III; Amphe-Lite and SJT-R Series, SAE AS39029 (28, 59, 60, 75, 76, 77)

#### COAX CONTACTS FOR USE IN LJTR, TVR, AMPHE-LITE AND SJTR CONNECTORS

| Cable                                                                                                                                 | Contact Part Number                            |                                                | Contact Size | Crimping Tools                                                                         |                                                                                                                                                                                                                                                                                           | Installation Tools                                                                                                      |                                                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------|--------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                       | Pin                                            | Socket                                         |              | Inner Contact                                                                          | Crimp Ferrule                                                                                                                                                                                                                                                                             | Insertion                                                                                                               | Removal                                                                                                                 |
| RG-178B/U, RG-196A/U                                                                                                                  | 21-33122-564<br>(M39029/76-425)<br>(L-2035-AG) | 21-33123-564<br>(M39029/77-429)<br>(L-2035-AJ) | 16           | M22520/2-01<br>with Positioner<br>M22520/2-35<br>or with<br>Daniels Positioner<br>K532 | M22520/4-01<br>with Positioner<br>M22520/4-02                                                                                                                                                                                                                                             | M81969/8-07<br>or<br>M81969/14-03<br>or<br>Amphenol<br>11-8674-16<br>11-8794-16<br>or<br>MS27495A16<br>or<br>MS27534-16 | M81969/8-08<br>or<br>M81969/14-03<br>or<br>Amphenol<br>11-8675-16<br>11-8795-16<br>or<br>MS27495R16<br>or<br>MS27534-16 |
| Haveg 30-00761, 30-02024,<br>30-02033<br>Tensolite 24713/A955KK1,<br>26723/A955KK1                                                    | 21-33122-562†<br>(L-2035-AN)                   | 21-33123-562†<br>(L-2035-AR)†                  |              |                                                                                        |                                                                                                                                                                                                                                                                                           |                                                                                                                         |                                                                                                                         |
| Haveg 61-02051                                                                                                                        | 21-33122-561†<br>(L-2035-AK) †                 | 21-33123-561†<br>(L-2035-AM) †                 |              |                                                                                        |                                                                                                                                                                                                                                                                                           |                                                                                                                         |                                                                                                                         |
| RG-174A/U, RG-188A/U,<br>RG-316/U,<br>RG-161/U RG-187A/U,<br>RG-179B/U,<br>Haveg 8100207, Times<br>(HS-179)<br>AA3248, Teledyne 11299 | 21-33122-563<br>(M39029/76-424)<br>(L-2035-AD) | 21-33123-563<br>(M39029/77-428)<br>(L-2035-AF) |              |                                                                                        |                                                                                                                                                                                                                                                                                           |                                                                                                                         |                                                                                                                         |
| RG-180B/U, RG-195A/U,<br>Raychem 9528A1318                                                                                            | 21-33122-541<br>(M39029/28-409)<br>(L-2035-C)  | 21-33123-541<br>(M39029/75-417)<br>(L-2035-D)  | 12           | M22520/2-01<br>with Positioner<br>M22520/2-34<br>or with<br>Daniels Positioner<br>K323 | M22520/31-01<br>with Positioner<br>M22520/31-02<br>or<br>Daniels<br>GS-200 Tool<br>with Positioner<br>G2P330                                                                                                                                                                              | M81969/8-09<br>or<br>M81969/14-04<br>or<br>Amphenol<br>11-8674-12<br>11-8794-12<br>or<br>MS27495A12<br>or<br>MS27534-12 | M81969/8-10<br>or<br>M81969/14-04<br>or<br>Amphenol<br>11-8675-12<br>11-8795-12<br>or<br>MS27495R12<br>or<br>MS27534-12 |
| Raychem 5022E5111                                                                                                                     | 21-33122-543†<br>(L-2035-M) †                  | 21-33123-543†<br>(L-2035-P)                    |              |                                                                                        |                                                                                                                                                                                                                                                                                           |                                                                                                                         |                                                                                                                         |
| Raychem 9530A5314                                                                                                                     | 21-33122-544†<br>(L-2035R)                     | 21-33123-544†<br>(L-2035-T) †                  |              |                                                                                        |                                                                                                                                                                                                                                                                                           |                                                                                                                         |                                                                                                                         |
| Raychem 9527A1318                                                                                                                     | 21-33122-545†<br>(L-2035-U) †                  | 21-33123-545†<br>(L-2035-W)                    |              |                                                                                        |                                                                                                                                                                                                                                                                                           |                                                                                                                         |                                                                                                                         |
| Raychem 9527A1314                                                                                                                     | 21-33122-585<br>(L-2035-GG)                    | 21-33123-585<br>(L-2035-GH)                    |              |                                                                                        |                                                                                                                                                                                                                                                                                           |                                                                                                                         |                                                                                                                         |
| Gore GWN1159A, Nexans<br>RG179-DT                                                                                                     | 21-33122-547<br>(L-2035-X) †                   | 21-33123-547<br>(L-2035-Z) †                   |              |                                                                                        |                                                                                                                                                                                                                                                                                           |                                                                                                                         |                                                                                                                         |
| M/A-Com 5M2869-001                                                                                                                    | 21-33122-589<br>(L-2035-GR)                    | 21-33123-589<br>(L-2035-GT)                    |              |                                                                                        |                                                                                                                                                                                                                                                                                           |                                                                                                                         |                                                                                                                         |
| RG-187A/U, RG-179B/U,<br>RG-174A/U,<br>RG-188A/U, RG-316/U,<br>RG-161/U<br>Haveg 8100207, Times<br>(HS-179)AA3248, Teledyne<br>11299  | 21-33102-23†<br>(L-1107-C)                     | 21-33101-23†<br>(L-1107-G)                     | 8            | M22520/2-01<br>with Positioner<br>M22520/2-31††<br>or solder                           | M22520/5-01<br>with die set<br>M22520/5-03 (A)<br>or M22520/5-08<br>(A)<br>M22520/5-35 (B)<br>or M22520/10-01<br>with Die Set<br>M22520/10-05<br>(A)<br>M22520/5-01<br>with die set<br>M22520/5-05 (A)<br>or M22520/5-19<br>(B)<br>or M22520/10-01<br>with Die Set<br>M22520/10-07<br>(A) | Hand<br>inserted                                                                                                        | 11-9170<br>or<br>MS                                                                                                     |
| RG-142B/U, RG-223/U                                                                                                                   | 21-33102-24*<br>(L-1107-D)                     | 21-33101-24*<br>(L-1107-H)                     |              |                                                                                        |                                                                                                                                                                                                                                                                                           |                                                                                                                         |                                                                                                                         |

NOTE: SAE AS39029 supersedes MIL-C-39029

CRIMPING TOOLS: Italicized letters in parenthesis that follow positioner part numbers indicate applicable die closure. Commercial equivalents with the same die closure dimension may be used.

CHART CONTINUES ON NEXT PAGE

CONTACT ORDERING: Example number given in chart 21-33122-564 should be ordered as 21-033122-564; example number 21-33102-23 should be ordered as 21-033102-023. Adding Zeros is necessary for Amphenol ordering process on all contact numbers

† Consult Amphenol Aerospace for current release of this contact or instruction sheet if applicable.

†† When inner contact is installed by crimping only, 11-10134 Expander Tool Kit must be used to assemble rear insulator over contact.

\*\*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)

**LJT-R, MIL-DTL-38999 Series I; TV-R, MIL-DTL-38999 Series III; Amphe-Lite and SJT-R Series, SAE AS39029 (28, 59, 60, 75, 76, 77), cont.**
**COAX CONTACTS FOR USE IN LJTR, TVR, AMPHE-LITE AND SJTR CONNECTORS, CONT.**

| Cable                                                                              | Contact Part Number<br>(Termination Instruction Sheet)***    |                                                              | Contact Size | Crimping Tools                                      |                                                                                                                    | Installation Tools |               |
|------------------------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|--------------|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------|---------------|
|                                                                                    | Pin                                                          | Socket                                                       |              | Inner Contact                                       | Crimp Ferrule                                                                                                      | Insertion          | Removal       |
| Haveg 51-03111, Tensolite 28895/2X1                                                | 21-33102-22<br>(L-1107-B)                                    | 21-33101-22<br>(L-1107-F)                                    | 8            | M22520/2-01 with Positioner M22520/2-31** or solder | M22520/5-01 with die set<br>M22520/5-05 (B) or M22520/5-41 (B)<br>or M22520/10-01 with Die Set<br>M22520/10-07 (B) | Hand inserted      | 11-9170 or MS |
| RG-180B/U, RG-195A/U, Raychem 9528A1318                                            | 21-33102-21 (M39029/60-367 Supersedes MS27536)<br>(L-1107-A) | 21-33101-21 (M39029/59-366 Supersedes MS27535)<br>(L-1107-E) |              | M22520/2-01 with Positioner M22520/2-31             | M22520/5-01 with Die Set<br>M22520/5-37 (B) or M22520/10-01 with Die Set<br>M22520/10-15 (A)                       |                    |               |
| RD-316 Double Shield (M17/152-00001)                                               | 21-33102-25<br>(L-1107-J)                                    | 21-33101-25<br>(L-1107-N)                                    |              |                                                     |                                                                                                                    |                    |               |
| Raychem 7524D5111-9 (triax cable - contact will terminate inner coax portion only) | 21-33102-26<br>(L-1107-M)                                    | 21-33101-26<br>(L-1107-M)                                    |              |                                                     |                                                                                                                    |                    |               |
| RG-400, ECS3C058A ECS352001                                                        | 21-33102-27<br>(L-1286-B)                                    | 21-33101-27<br>(L-1293-B)                                    |              | M22520/2-01 with Positioner M22520/2-10             | M22520/5-01 with Die Set<br>M22520/5-45 (A)                                                                        |                    |               |
| RG-58 (M17/155-00001), M17/028-RG-058                                              | 21-33102-29<br>(L-1107-AA)                                   | 21-33101-29<br>(L-1107-Y)†                                   |              | Solder                                              | M22520/5-01 with Die Set<br>M22520/5-05 (B)                                                                        |                    |               |
| 5021D1331-0                                                                        | 21-33102-36<br>(L-1107-P)                                    | 21-33101-36†<br>(L-1107-Q)                                   |              |                                                     |                                                                                                                    |                    |               |
| 5M2869-001 ESC432101                                                               | 21-33102-37<br>(L-1107-V)                                    | 21-33101-37<br>(L-1107-W)                                    |              | M22520/2-01 with Positioner M22520/2-31             | M22520/5-01 with Die Set<br>M22520/5-05 (B) or M22520/10-01 with Die Set<br>M22520/10-07 (B)                       |                    |               |
| 5022A1311-0                                                                        | 21-33102-39<br>(L-1107-AC)                                   | 21-33101-36†<br>(L-1107-AB)                                  |              |                                                     |                                                                                                                    |                    |               |
| FA-19X                                                                             | 21-33652-1<br>(L-2091-A)                                     | 21-033653-1<br>(L-2091-B)                                    |              | M22520/2-01 with Positioner K1106                   | M22520/5-01 with Die Set Y25 (B)                                                                                   |                    |               |
| T Flex-402                                                                         | 21-33102-41<br>(L-1107-AG)                                   | 21-33101-41<br>(L-1107-AF)                                   |              | Solder                                              | M22520/5-01 with Die Set<br>M22520/5-05 (B)                                                                        |                    |               |

NOTE: SAE AS39029 supersedes MIL-C-39029

NOTE: Contacts can be ordered by part numbers given in chart

CRIMPING TOOLS: Italicized letters in parenthesis that follow positioner part numbers indicate applicable die closure. Commercial equivalents with the same die closure dimension may be used.

CONTACT ORDERING: Example number given in chart 21-33102-22 should be ordered as 21-033102-022; example number 21-33652-1 should be ordered as 21-033652-001. Adding Zeros is necessary for Amphenol ordering process on all contact numbers.

† Consult Amphenol Aerospace for current release of this contact or instruction sheet if applicable

\*\*When inner contact is installed by crimping only. 11-10134 Expander Tool Kit must be used to assemble rear insulator over contact.

\*\*\*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)38999  
III  
II  
I  
SJT26482  
Matrix 283723 III  
Matrix  
Pyle5015  
Crimp Rear  
Release Matrix

26500 Pyle

Printed  
Circuit BoardEMI Filter  
Transient

Fiber Optics

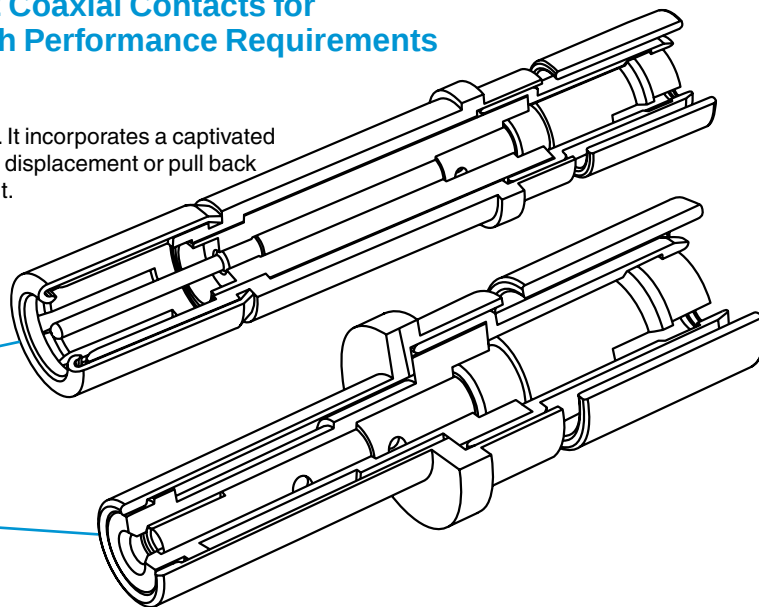
High Speed  
ContactsOptions  
Others

### Amphenol® Matched Impedance Size 12 Coaxial Contacts for RF/Microwave, High Frequency and High Performance Requirements

The matched impedance coax contact is available in size 12. It incorporates a captivated inner contact which “snaps into” the outer contact preventing displacement or pull back of the inner contact in situations where the cable may be bent.

**TYPICAL MATCHED IMPEDANCE COAX SOCKET CONTACT**  
has socket outer contact with a captivated pin inner contact

**TYPICAL MATCHED IMPEDANCE COAX PIN CONTACT**  
has pin outer contact with a captivated socket inner contact



Design features and benefits of the Matched Impedance:

- For use in 90 degree angle or bent cable applications
- Provides 50 ohm matched impedance resulting in low VSWR and low insertion loss
- Frequency range for a mated pair extends to 3 GHz and beyond, higher than other coaxial contacts previously offered.
- Ideally suited for D38999 high performance and MIL-STD-1760 high band coaxial contact requirements

### High Performance Size 12 Coax 50 Ohm matched

LJT-R, MIL-DTL-38999 Series I, JT-R, MIL-DTL-38999 Series II, and TV-R, MIL-DTL-38999 Series III

| Use with Cable                          | Comment                       | Pin<br>(Termination Instruction Sheet)*** | Socket<br>(Termination Instruction Sheet)*** |
|-----------------------------------------|-------------------------------|-------------------------------------------|----------------------------------------------|
| RG316, T-Flex-405                       | M39029/102/103                | 21-33651-11<br>(L-2092-C)                 | 21-33650-11<br>(L-2092-C)                    |
| RG-316, T-Flex-405                      | JT-R, MIL-DTL-38999 Series II |                                           | 21-33729-11<br>(L-2092-P)                    |
| RD316, Filotex, ET124962, M17/152-00001 | M39029/102/103 Type           | 21-33651-17<br>(L-2092-F)                 | 21-33650-17<br>(L-2092-F)                    |
| JN1088WT                                | JN1104*50C                    | 21-33213-42                               | 21-33214-42<br>(L-2092-D)                    |
| PAN6422XQ                               | PAN6841*50C                   | 21-33651-12<br>(L-2092-E)                 | 21-33650-12                                  |
| RG178, Gore CXN 3403                    | M39029/102/103 Type           | 21-33651-18<br>(L-2092-K)                 | 21-33650-18<br>(L-2092-K)                    |
| RG178, Gore CXN 3403                    | JT-R, MIL-DTL-38999 Series II |                                           | 21-33729-18<br>(L-2092-K)                    |
| SFT-316-TR                              | M39029/102/103 Type           | 21-33651-22<br>(L-2092-N)                 | 21-33650-22<br>(L-2092-N)                    |
| Semflex SW060                           | M39029/102/103 Type           | 21-33651-25                               | 21-33650-25                                  |
| Semflex SW086 (solid inner conductor)   | M39029/102/103 Type           | 21-33651-26                               | 21-33650-26                                  |

\* Add P or S for pin or socket

CONTACT ORDERING: Example number given in chart 21-33651-11 should be ordered as 21-033651-011. Adding Zeros is necessary for Amphenol ordering process on all contact numbers.

\*\*\*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)

### Matched Impedance Coax Contact Performance:

Electrical Specifications:

- Contact impedance = 50 ohms nominal
- Frequency range = 0–3 GHz Operable at higher frequencies depending on cable selection. Consult Amphenol for details.
- Dielectric withstanding voltage (for a mated pair):  
At sea level = 1000 VRMS  
At 50, 000 ft. = 250 VRMS
- Insulation resistance: 5 gigaohms min. @ 25°C
- VSWR: 1.20 + .04F (F in GHz) max. up to 3 GHz
- Insertion Loss:  $.11 \sqrt{f \text{ GHz}} \text{ dB max.}$

Environmental Specifications:

- Thermal limits: –55 ° to 200°C

Mechanical Specifications:

- Mating: slide-on
- Mounting: conforms to M39029/102 & /103 envelope dimensions

# Typical Contact Installation Instructions for Coax Contacts

The following is an example of a contact instruction sheet that would be shipped within the package of contacts for a Crimp, Size 12 Coax Contact for use in Subminiature, D38999 connectors. The sheet provides detailed instructions for assembling the component parts and for crimping the contact to coaxial cable, along with the recommended cable and tooling to be used. Installation instructions are included within all contacts for D38999 connectors. For installation instructions for other connector series, there are separate documents (not included in packaging of parts) as follows: L-633 for Miniature solder types, L-613 for Miniature SE types, L-660 for Miniature CE types, and L-650 for MS/Standard and Heavy Duty types. For any other instructions needed, consult Amphenol. Most installation instructions can be found on-line at [www.amphenol-aerospace.com](http://www.amphenol-aerospace.com) (from home page, go to Service Instructions and enter contact part number or instruction sheet number).

## 21-33651-11 (PIN)

## 21-33650-11 (SOCKET)

Contact, Pin and Socket, Coaxial,  
Type LJT-R & TV-R, (MIL-DTL-38999 Series I & III) Crimp, Size 12  
Installation Instructions

See table on reverse side for coaxial cable recommended and crimp tool information.

- A. 1. Slide outer crimp ferrule over cable outer jacket as shown.
2. Strip cable outer braid as illustrated. Ends must be cut cleanly and at right angles to the axial plane of the cable. The cable must not be deformed while making cuts.
3. Flare outer braid, then strip cable dielectric as shown.
- B. 1. Assemble inner contact assembly over cable center conductor and cable dielectric until inside bore of bushing butts against cable dielectric.
2. Cable center conductor must be visible through the inspection hole in the inner contact wire well.
3. Crimp inner contact wire well using crimp tool listed in table.
- C. 1. Carefully slide outer contact assembly over inner contact assembly and under cable outer braid until inner contact butts against insulator shoulder as illustrated. (Inner contact assembly will snap into the locked position when fully assembled inside the outer contact assembly.)
2. Bring outer crimp ferrule forward over cable outer braid as illustrated. (Continue to push the inner contact assembly fully forward while bringing the outer crimp ferrule into position.)
3. Crimp outer crimp ferrule using crimp tool listed in table (.156 Max. over ferrule after crimping). Trim excess braid ahead of crimp ferrule, if necessary.

### CONTACT INSERTION INTO CONNECTOR

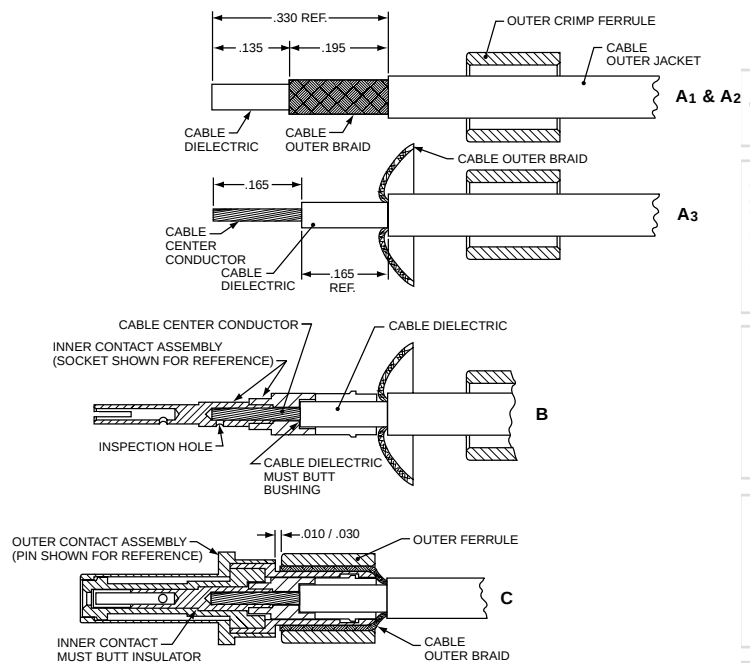
Using insertion tool (part number M81969/8-09 or M81969/14-04), insert contact assembly into rear connector grommet hole. Contact must be aligned with hole and not inserted at an angle. Push forward until contact is felt to snap into position within insert. Remove tool.

### CONTACT REMOVAL FROM CONNECTOR

Position removal tool (part number M81969/8-10 or M81969/14-04) around cable and slide tool down wire until tool tips enter rear grommet and come to a positive stop. Hold tool tip firmly against positive stop on contact, grip wire and simultaneously remove tool, contact and cable.

## 21-33651-11 (PIN)

## 21-33650-11 (SOCKET)



L-2092-C  
October 2001

FSCM77820

| Amphenol®<br>Part Number | Description                                  | Coaxial Cable<br>Accommodated | Tools           |         |                         |               |                                          |
|--------------------------|----------------------------------------------|-------------------------------|-----------------|---------|-------------------------|---------------|------------------------------------------|
|                          |                                              |                               | Inner Contact   |         |                         | Outer Contact |                                          |
|                          |                                              |                               | Crimp Tool      | Setting | Positioner<br>(Daniels) | Tool          | Positioner                               |
| 21-33651-11              | Matched Impedance*<br>Size 12 Coax<br>Pin    | RG316<br>(M17/113-RG316)      | MH992 (Daniels) | 5       | K1360                   | M22520/5-01   | M22520/5-03 (A)<br>or<br>M22520/5-35 (B) |
|                          |                                              | RG179<br>(M17/094-RG179)      | MH992 (Daniels) | 4       | K1360                   |               |                                          |
| 21-33650-11              | Matched Impedance*<br>Size 12 Coax<br>Socket | RG316<br>(M17/113-RG316)      | MH992 (Daniels) | 5       | K1360                   |               |                                          |
|                          |                                              | RG179<br>(M17/094-RG179)      | MH992 (Daniels) | 4       | K1360                   |               |                                          |

\* Matched Impedance applies when contacts are terminated to RG316 cable only.

### Amphenol® High Frequency Contacts

Amphenol and SV Microwave (an Amphenol company) offer DC to 40 GHz high frequency size 8, 12 and 16 coaxial contacts for the D38999 Series III housing and standard inserts. These contacts allow any application to continue to use the D38999 connector and be able to expand the use to include the microwave transmission lines. Features include:

- Superior electrical performance and high frequency capability
- Blindmate advantage and maintenance of an accurate phase length when mated
- Can be terminated to a multiple of cable types depending on the application
- Uses standard interfaces based on MIL-STD-348, and can be installed in any MIL-DTL-38999 size 8, 12 or 16 insert
- Unique "Float Mount" technology allows for consistent microwave performance while maintaining tight mechanical tolerances



Subminiature MIL-DTL-38999 Series III Connector with Size 8 High Frequency Contacts

### HIGH FREQUENCY CONTACTS SPECIFICATIONS

#### Electrical

(Mated pair size 8 - RG 405 Semi-Rigid Cable)

|                                 |                       |
|---------------------------------|-----------------------|
| Impedance                       | 50 Ω                  |
| Frequency Range                 | DC - 40 GHz           |
| VSWR                            | 1.05 +.01 (freq. GHz) |
| Insertion Loss                  | 0.03.√(freq. GHz)     |
| Insulation Resistance (Min.)    | 10,000 M Ω            |
| Contact Resistance (Max.)       |                       |
| Center conductor:               | 6.0 mΩ                |
| outer conductor:                | 3.0 mΩ                |
| outer to cable:                 | 0.5 mΩ                |
| Dielectric Withstanding Voltage | 1,000 VRMS            |
| Corona Extinction Voltage       | 250 VRMS              |
| RF High Potential Voltage       | 500 VRMS              |
| RF Leakage                      | - (80-freq. GHz)      |

#### Materials and Finish

|                      |                                                                                                                                                                             |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Body and Sleeve      | Stainless steel per AMS-5640 Alloy UNS S30300 Type 1                                                                                                                        |
| Ferrule              | Brass per ASTM B16, Alloy UNS C36000                                                                                                                                        |
| Contact & Lock Ring  | Beryllium copper per ASTM B196 Alloy UNS C17300, Td04                                                                                                                       |
| Insulator            | PTFE per ASTM D1710, Type 1, Grade 1, Class B                                                                                                                               |
| Spring               | Stainless steel per ASTM A313 Type 631                                                                                                                                      |
| Rear Body & Contacts | Gold per ASTM B488 Type II, Code C, Class 1.27; over Nickel per AMS-QQ-N-290 Class 1 (60μ inches); over Copper per MIL-C-14550 (10μ inches) Passivated per AMS-2700, Type 2 |

#### Environmental

|                                |                                                       |
|--------------------------------|-------------------------------------------------------|
| Temperature Range              | -65°C to +125°C                                       |
| Corrosion (Salt Spray)         | MIL-STD-202, Method 101, Condition B                  |
| Vibration                      | MIL-STD-202, Method 204, Condition D, 20 Gs           |
| Shock                          | MIL-STD-202, Method 213, Condition 1, 100 Gxs         |
| Thermal Shock                  | MIL-STD-202, Method 107, Condition B, -65°C to +125°C |
| Moisture Resistance            | MIL-STD-202, Method 106, Less step 7B                 |
| Barometric Pressure (Altitude) | MIL-STD-202, Method 105, Condition C, 70,000 ft.      |

### HIGH FREQUENCY COAX CONTACTS FOR USE IN D38999, SERIES III CONNECTORS

| High Frequency Amphenol Part Number<br>(Termination Instruction Sheet) | Interface     | Frequency | For use with Cable | Type   | Cavity Size | Piggyback Grommet |
|------------------------------------------------------------------------|---------------|-----------|--------------------|--------|-------------|-------------------|
| 21-033449-01HF<br>(300-17-008)                                         | BMZ           | 40 GHz    | TFLEX-405          | Socket | 8           | 21-033321-007     |
| 21-033448-01HF<br>(300-17-008)                                         |               |           |                    | Pin    |             |                   |
| 21-033449-02HF<br>(300-89-009)                                         | BMZ           | 18 GHz    | TFLEX-405          | Socket | 8           | 21-033321-007     |
| 21-033448-02HF<br>(300-89-009)                                         |               |           |                    | Pin    |             |                   |
| 21-033449-03HF<br>(300-89-008)                                         | BMZ           | 12 GHz    | RG-400/<br>RG-142  | Socket | 8           | 21-033321-009     |
| 21-033448-03HF<br>(300-89-008)                                         |               |           |                    | Pin    |             |                   |
| 21-033449-04HF<br>(300-89-002)                                         | BMZ           | 18 GHz    | TFLEX-402          | Socket | 8           | 21-033321-010     |
| 21-033448-04HF<br>(300-89-002)                                         |               |           |                    | Pin    |             |                   |
| 21-033449-06HF                                                         | BMA           | 26.5 GHz  | TFLEX-405          | Socket | 8           | 21-033321-007     |
| 21-033448-06HF                                                         |               |           |                    | Pin    |             |                   |
| 21-033449-07HF                                                         | BMA           | 26.5 GHz  | TFLEX-402          | Socket | 8           | 21-033321-010     |
| 21-033448-07HF                                                         |               |           |                    | Pin    |             |                   |
| 21-033449-08HF                                                         | BMZ-75<br>Ohm | 2 GHz     | LMR-240-75         | Socket | 8           | 21-033321-008     |
| 21-033448-08HF                                                         |               |           |                    | Pin    |             |                   |
| 21-033449-09HF                                                         | SMPM          | 65 GHz    | TFLEX-405          | Socket | 12          | N/A               |
| 21-033448-09HF                                                         |               |           |                    | Pin    |             |                   |
| 21-033449-10HF                                                         | SMPS          | 65 GHz    | 0.047 Dia. Cable   | Socket | 16          | N/A               |
| 21-033448-10HF                                                         |               |           |                    | Pin    |             |                   |

# Twinax Contacts for MIL-DTL-38999

## General Description, Application Data - Size 10 & 12

**Amphenol® Twinax Contacts** -Were designed for use with twinax cable in Data Bus systems. Twinax contacts provide the following benefits:

- Protection from magnetic interference
- Protection from electrostatic interference including nuclear electromagnetic pulse
- Meets parameters defined by MIL-STD-1553B
- Maintains shield integrity through a multi-pin circular connector and does not require contact polarization within the insert

### SIZE 10 & 12 CONCENTRIC TWINAX CONTACTS

The size 12 concentric twinax contact interface was developed for JN1104 EuroFighter contacts, and can be used in any size 12 cavity M38999 I, II or III or SJT connector.

Features:

- Operating temperature -55°C to 175°C
- Pins are scoop-proof
- Meets performance levels of M38999 connector
- 4 components, gold plated crimp termination
- For use with a variety of cables (See chart below)

### TYPICAL ELECTRICAL PERFORMANCE

#### Size 10 & 12 Concentric Twinax Contacts

Voltage Rating: 500 Vrms max. @ sea level

Contact Resistance:

Center @ 1 Amp, 55 millivolts max. voltage drop @ 25°C

Intermediate @ 1 Amp, 55 millivolts max. voltage drop @ 25°C

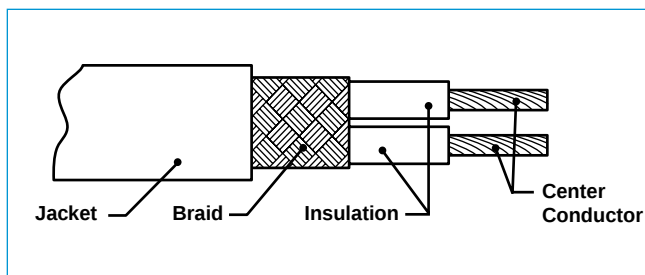
Outer @ 12 Amps, 85 millivolts max. voltage drop @ 25°C

Operating Frequency: 0-30 MHz

Dielectric Withstanding Voltage:

Center to Intermediate 800 VAC Rms @ Sea Level

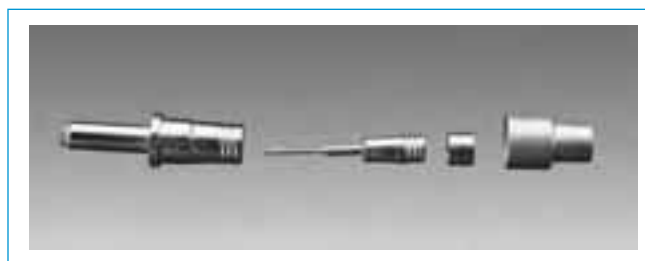
Intermediate to Outer 500 VAC Rms @ Sea Level



Cable Illustration - Twinax Contact



Concentric Twinax Contacts Size 12



Unassembled Components of Size 12 Concentric Twinax Contact

| SIZE 10 & 12 CONCENTRIC TWINAX CONTACTS FOR USE IN D38999 CONNECTORS |                                                                                   |                             |              |                                  |                      |
|----------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------|--------------|----------------------------------|----------------------|
| For use with Cable                                                   | Concentric Twinaxial Contact Part Number<br><br>(Termination Instruction Sheet)** |                             | Contact Size | Comments                         | Connector Series     |
|                                                                      | Pin                                                                               | Socket                      |              |                                  |                      |
| M17/176-00002, ST5M1212-002                                          | 21-33909-25<br>(L-2092-G)                                                         | 21-33908-25<br>(L-2092-G)   | 12           | JN1104 Interface                 | D38999 Series I, III |
| 0024A0024, Fileca F2709-13-CA                                        | 21-33909-28<br>(L-2092-G)                                                         | 21-33908-28<br>(L-2092-G)   |              |                                  |                      |
| EPD32263A,10612, GSC-12-2548-00                                      | 21-33909-29<br>(L-2092-H)                                                         | 21-33908-29<br>(L-2092-H)   |              |                                  |                      |
| ASNE0849, 5PTM1T04-1                                                 | 21-33909-81<br>(L-2092-AB)                                                        | 21-33908-81<br>(L-2092-AB)  |              |                                  |                      |
| VG95218T023D002                                                      | 21-33909-91<br>(L-2092-AC)                                                        | 21-33908-91<br>(L-2092-AC)  |              |                                  |                      |
| VG95218T023D002                                                      | 21-33909-101<br>(L-2092-AC)                                                       | 21-33908-101<br>(L-2092-AC) |              |                                  |                      |
| M17/176-00002, GSC-12-2549-00                                        |                                                                                   | 21-33640-25<br>(L-2092-W)   | 12           | JN1104 Interface                 | D38999 Series II     |
| 0024A0024                                                            |                                                                                   | 21-33640-28<br>(L-2092-V)   |              |                                  |                      |
| 5M2022-003                                                           | 21-33844-1<br>(L-1255-A)                                                          | 21-33843-1<br>(L-1255-B)    | 10           | Supplied with Thermal fit sleeve | D38999 Series I, III |

CONTACT ORDERING: Example number given in chart above 21-33909-25 should be ordered as 21-033909-025; example number 21-33843-1 should be ordered as 21-033843-001. Adding Zeros is necessary for Amphenol ordering process on all contact numbers.

\*\*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)

38999

SJT

I

II

III

26482

Matrix 2

83723 III

Matrix

Pyle

5015

Crimp Rear Release Matrix

26500 Pyle

Printed Circuit Board

EMI Filter Transient

Fiber Optics

High Speed Contacts

Options Others

High performance connectors within the D38999 families are the most commonly used connectors for incorporation of Twinax contacts. These connectors offer wide versatility in insert arrangements for not only concentric Twinax contacts, but also coax, triax, PCB, wire wrap, thermocouples and EMI filter contacts.

Other connectors available with concentric Twinax contacts:

- Wire Integrated Connectors (WICS) for Data Bus Systems. Consult Amphenol Aerospace, Sidney, NY.
- ARINC 404, ARINC 600 and R27 Series rectangular connectors. Supplied by Amphenol Canada.

### SIZE 8 CONCENTRIC TWINAX CONTACTS

The size 8 concentric Twinax contact was developed for use in MIL-STD-1553 Airborne multiplex data bus applications which require high performance interconnect characteristics in multi-pin circular connectors. Ideal for this application need is the high performance Tri-Start connector with its fully scoop-proof feature of recessed pins. The concentric Twinax contact is crimp terminable to twisted shielded cable. Features include:

- Provides protection from magnetic and electrostatic interference including nuclear electromagnetic pulse
- Maintains shield integrity through a multi-pin circular connector and does not require contact polarization within the insert
- 175°C rated and meets performance levels of MIL-DTL-38999 Series III connectors
- MIL-C-17/176-00002 cable termination
- Gold plated full crimp termination contacts qualified to M39029/90 & /91
- Integral part of the MIL-STD-1760 interconnection system
- Also available in modified but intermateable versions for termination to a host of cables (See chart on next page)

### TYPICAL ELECTRICAL PERFORMANCE

#### Size 8 Concentric Twinax Contacts

Voltage Rating: 500 Vrms max. @ sea level

Contact Resistance:

Center @ 1 Amp, 55 millivolts max. voltage drop @ 25°C

Intermediate @ 1 Amp, 55 millivolts max. voltage drop @ 25°C

Outer @ 12 Amps, 75 millivolts max. voltage drop @ 25°C

Operating Frequency: 0–20 MHz

Dielectric Withstanding Voltage:

Center to Intermediate: 1000 VAC Rms @ Sea Level

Intermediate to Outer: 500 VAC Rms @ Sea Level

### SHORT PROFILE TWINAX CONTACT OPTION

A Short Profile size 8 Twinax is available that can be used with a low profile right angle backshell and can offer increased packaging efficiency. Consult Amphenol Aerospace for further information.



MIL-DTL-38999 Series III Connector with Twinax Contacts and Standard Contacts



Concentric Twinax Contacts Size 8



Short Profile Twinax vs Standard Length Twinax Contact

# Twinax Contacts for MIL-DTL-38999

## General Description, Application Data - Size 8, cont.

### SIZE 8 CONCENTRIC TWINAX CONTACTS FOR USE IN D38999 CONNECTORS

| For use with Cable                                                         | Size 8 Concentric Twinaxial Contact Part Number<br>(Termination Instruction Sheet)** |                             | Comments                                                     | Connector Series     |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------|----------------------|
|                                                                            | Pin                                                                                  | Socket                      |                                                              |                      |
| M17/176-00002, 5PTM1T04-2                                                  | 21-33190-529<br>(L-1253-A)                                                           | 21-33191-530<br>(L-1253-B)  | M39029/90/91 (Amphenol)<br>Supplied with heat shrink seal    | D38999 Series I, III |
| M17/176-00002                                                              | T3-46T08-LD<br>(PN-430)                                                              | T3-47T08-LD<br>(PN-430)     | M39029/90/91 (Pyle)<br>Supplied with heat shrink seal        |                      |
| M17/176-00002                                                              | 21-33190<br>(L-1253-A)                                                               | 21-33191<br>(L-1253-B)      | Without seals                                                |                      |
| M17/176-00002                                                              | 21-33190-1<br>(L-1253-A)                                                             | 21-33191-1<br>(L-1253-B)    | Supplied with piggyback grommet seal                         |                      |
| Raychem 10612, 5M2022-003                                                  | 21-33190-26<br>(L-1253-AA)                                                           | 21-33191-26†                | Without seals                                                |                      |
| Raychem 10614, EPD22189B, 7724C8664, 05A0771, GC875TM24H, T10971           | 21-33190-22<br>(L-1253-C)                                                            | 21-33191-22<br>(L-1253-D)   | Without seals                                                |                      |
| Raychem 10613, PAN711-6421, 23089/RC                                       | 21-33190-27<br>(L-1253-K)                                                            | 21-33191-27<br>(L-1253-L)   | Supplied with heat shrink seal                               |                      |
| Raychem 10613, PAN711-6421, 23089/RC                                       | 21-33190-29<br>(L-1253-K)                                                            | 21-33191-29<br>(L-1253-L)   | Supplied with piggyback grommet seal                         |                      |
| Raychem 10613, PAN711-6421, 23089/RC                                       | 21-33190-30<br>(L-1253-K)                                                            | 21-33191-30<br>(L-1253-L)   | Without seals                                                |                      |
| GSC-12-2548-00, 7726D0664                                                  | 21-33190-40<br>(L-1253-S)                                                            | 21-33191-40<br>(L-1253-T)   | Supplied with heat shrink sleeve                             |                      |
| Axon P517417                                                               | 21-33190-81<br>(L-1253-W)†                                                           | 21-33191-81<br>(L-1253-Y)†  | Supplied with piggyback grommet seal                         |                      |
| Raychem 10612, 5M2022-003                                                  | 21-33190-261<br>(L-1253-AA)                                                          | 21-33191-261†               | Supplied with piggyback grommet seal                         |                      |
| Raychem 10612, 5M2022-003                                                  | 21-33190-262<br>(L-1253-AA)                                                          | 21-33191-262†               | Supplied with heat shrink seal                               |                      |
| Raychem 10614, 7724C8664                                                   | T3-46TB08-LD<br>(PN-494)                                                             | T3-47TB08-LD<br>(PN-494)    | Without seals                                                |                      |
| 7820D0111 (20 AWG)                                                         | T3-46TC08-LD<br>(PN-537)                                                             | T3-47TC08-LD<br>(PN-537)    | Without seals                                                |                      |
| Gore CXN2268                                                               | T3-46TE08-LD<br>(PN-1001)                                                            | T3-47TE08-LD<br>(PN-1001)   | Short profile<br>Supplied with heat shrink seal (.450)       |                      |
| M17/176-00002                                                              | T3-46TD08-LD<br>(PN-1000)                                                            | T3-47TD08-LD<br>(PN-1000)   | Short profile<br>Supplied with heat shrink seal (.450)       |                      |
| M17/176-00002                                                              | 21-33910-15†<br>(PN-1005)                                                            | 21-33922-15<br>(PN-1005)    | Short profile<br>Without seals (.263)                        |                      |
| M17/176-00002                                                              | 21-33617-1<br>(REF PN-100)                                                           |                             | Short profile<br>Supplied with piggyback grommet seal (.450) |                      |
| Gore CNX2702                                                               | T3-46TF08-LD<br>(PN-1002)                                                            | T3-47TF08-LD<br>(PN-1002)   | Short profile<br>Supplied with heat shrink seal (.450)       |                      |
| M17/176-00002                                                              |                                                                                      | P-209546-27†                | Short profile<br>Without seals (.303)                        |                      |
| S280W502-1, Fileca F2709-13-CA, HS5930, Raychem 10602 0024G0024, 0024A0024 | 21-33190-70<br>(L-1253-U)                                                            | 21-33191-70<br>(L-1253-V)   | Without seals                                                |                      |
| S280W502-1, Fileca F2709-13-CA, HS5930, Raychem 10602 0024G0024, 0024A0024 | 21-33190-71<br>(L-1253-U)                                                            | 21-33191-71<br>(L-1253-V)   | Supplied with piggyback grommet seal                         |                      |
| S280W502-1, Fileca F2709-13-CA, HS5930, Raychem 10602 0024G0024, 0024A0024 | 21-33190-72<br>(L-1253-U)                                                            | 21-33191-72<br>(L-1253-V)   | Supplied with heat shrink seal                               |                      |
| 0024A0311, PIC E10244                                                      | 21-33190-90†                                                                         | 21-33191-90<br>(L-1253-AD)  | Without seals                                                |                      |
| 0024A0311, PIC E1024                                                       | 21-33190-91†                                                                         | 21-33191-91<br>(L-1253-AD)  | Supplied with piggyback grommet seal                         |                      |
| 0024A0311, PIC E1024                                                       | 21-33190-92†                                                                         | 21-33191-92<br>(L-1253-AD)  | Supplied with heat shrink seal                               |                      |
| M17/176-00002                                                              | 21-33190-625<br>(L-1253-AG)                                                          | 21-33191-628<br>(L-1253-AG) | M39029/113-625 & /114-628<br>Supplied with heat shrink seal  |                      |

CONTACT ORDERING: Example number given in chart above 21-33190-529 should be ordered as 21-033190-529; example number 21-33190-1 should be ordered as 21-033190-001. Adding Zeros is necessary for Amphenol ordering process on all contact numbers.

\*\*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 contact or instruction sheet if applicable.

III  
II  
I  
SJT

26482  
Matrix 2

83723 III  
Matrix  
Pyle

5015  
Crimp Rear  
Release Matrix

26500 Pyle

Printed  
Circuit Board

EMI Filter  
Transient

Fiber Optics

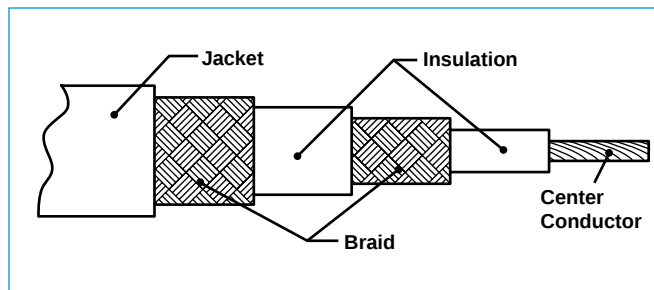
High Speed  
Contacts

Options  
Others

**Amphenol® Triax Contacts** -Provide additional shielding when terminated to triax cable having solid or stranded center conductors. Amphenol supplies triax contacts in sizes 8, 10 and 12 and they are ideally suited for use in D38999 Series I, II and III circular connectors.

Features and benefits of Amphenol triax contacts include:

- Incorporates three conductors, designed for use with triax cable
- Each of the three conductors are separated by dielectric insulation to isolate ground planes
- Shielding effectiveness is improved with two isolated shields
- May be specified for direct connection to printed circuit boards
- May be mixed with coax, twinax and power contacts in a single connector



Cable Illustration - Triax Contact



Triax Size 8 Pin Contact



Triax Size 12 Socket Contact

#### TYPICAL ELECTRICAL PERFORMANCE

##### Size 8, 10 and 12 Triax Contacts

Center @ 1 Amp, 120 millivolts max. voltage drop @ 25°C  
Intermediate @ 1 Amp, 60 millivolts max. voltage drop @ 25°C  
Outer @ 12 Amps, 90 millivolts max. voltage drop @ 25°C

Operating Frequency:

Size 12: 0-30 MHz

Size 10: 0-300 MHz

Size 8: 0-500 MHz

Dielectric Withstanding Voltage:

Center to Intermediate 800 VAC Rms @ Sea Level

Intermediate to Outer 500 VAC Rms @ Sea Level

Insulation Resistance:

1000 megohms minimum @ 25°C

#### SIZE 8, 10 & 12 TRIAX CONTACTS FOR USE IN D38999 SERIES I & III CONNECTORS

| For use with Cable                                                                                                                    | Size | Size 8, 10, 12 Triax Contact Part Number<br>(Termination Instruction Sheet)** |                                          | Comments                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------|------|-------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------------------------------|
|                                                                                                                                       |      | Pin                                                                           | Socket                                   |                                                                   |
| 5M2397-002, 81264-02, RGX-179, RT-179, Champlain 81-00321A, Tensolite 28883/02060X-1(LD), 7528A5314, Thermatics 12447, 28883/02060X-1 | 8    | 21-33198-3<br>(L-1254-F)                                                      | 21-33197-3<br>(L-1254-E)                 |                                                                   |
| 752866314, 7528G6314                                                                                                                  | 8    | 21-33198-11<br>(L-1254-V)                                                     | 21-33197-11<br>(L-1254-T)                |                                                                   |
| 5M2559-001, 81264-01, Tensolite 28598/9J063T-1, Teledyne 13809, Cheminax 9530F5214                                                    | 8    | 21-33198-4<br>(L-1254-D)                                                      | 21-33197-4<br>(L-1254-C)                 |                                                                   |
| ST5M1323-001, Champlain 81-00700, Teledyne 11914/1, Times AA6603, Tensolite 26895/90334X-1                                            | 8    | 21-33198-10<br>(L-1254-S)                                                     | 21-33197-10<br>(L-1254-S)                |                                                                   |
| 5M2397-002                                                                                                                            | 10   | 21-33800-1<br>(L-1256-A)                                                      | 21-33801-1<br>(L-1256-B)                 |                                                                   |
| JN1088WU (75Ω), JN1088WT (50Ω)                                                                                                        | 12   | 21-33909-12<br>(L-1256-J)                                                     | 21-33908-12<br>(L-1256-J)                | JN1104 Interface                                                  |
| GSC-03-81497-00 (75Ω)                                                                                                                 | 12   | 21-33909-23<br>(L-1256-M)                                                     | 21-33908-23<br>(L-1256-M)                | Replaced by -33 with improved rear insulator                      |
| GSC-03-81497-00 (75Ω)                                                                                                                 | 12   | 21-33909-33<br>(L-1256-P)                                                     | 21-33908-33<br>(L-1256-P)                | JN1104 Interface                                                  |
| Harbour TRX179, Times Microwave AA-6151 (RT-179), Axon RGX-179, 540-1050-000 (75Ω)                                                    | 12   | 21-33909-71<br>(L-1256-AA)                                                    | 21-33908-71<br>(L-1256-AA)               |                                                                   |
| 10602 (Twinax)                                                                                                                        | 8    | 21-33724-15<br>(L-1255-C)                                                     | (Consult with Amphenol for availability) | Special design with triax mating end and twinax cable termination |

CONTACT ORDERING: Example number given in chart 21-33198-3 should be ordered as 21-033198-003; example number given in chart 21-33198-10 should be ordered as 21-033198-010. Adding Zeros is necessary for Amphenol ordering process on all contact numbers.

\*\*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)

### Amphenol® Printed Circuit Tail Contacts

are currently supplied as follows:

- 8, 12 and 16 Coax
- 8, 10 and 12 Twinax
- 8 Triax (socket only)

PC Tail shielded contacts provide a cost effective packaging solution for limited space applications where connectors are attached to printed circuit boards. High reliability is assured with factory pre-assembled contacts and standardization termination to the board. PC Tail contacts are available for MIL-DTL-38999 Series I and III circular connectors and also for ARINC 404, ARINC 600 and R27 rectangular connectors. The following pages (402 & 403) show the available PC Tail contact part numbers for 38999 Circular connectors. See page 412 Rectangular Section of this catalog for information on twinax contacts for ARINC Rectangular connectors along with compatible cable terminations. Consult Amphenol Aerospace for further information on the applicable tooling for these contacts.



PC Tail Coax and Twinax Contacts for Attachment to Printed Circuit Boards

### TYPICAL ELECTRICAL PERFORMANCE

#### Size 8, 12 & 16 PC Tail Coax Contacts

Contact Resistance:

Center @ 1 Amp, 55 millivolts max. voltage drop @ 25°C

Outer @ 1 Amp, 55 millivolts max. voltage drop @ 25°C

Operating Frequency: 0–500 MHz

Dielectric Withstanding Voltage:

Center to Outer 500 VAC Rms @ Sea Level

Insulation Resistance

1,000 megohms minimum @ 25°C

### TYPICAL ELECTRICAL PERFORMANCE

#### Size 8, 10 & 12 PC Tail Twinax Contacts

Contact Resistance:

Center @ 1 Amp, 55 millivolts max. voltage drop @ 25°C

Intermediate @ 1 Amp, 55 millivolts max. voltage drop @ 25°C

Outer @ 1 Amp, 55 millivolts max. voltage drop @ 25°C

Operating Frequency: 0–20 MHz

Dielectric Withstanding Voltage:

Center to Intermediate 500 VAC Rms @ Sea Level

Intermediate to Outer 500 VAC Rms @ Sea Level

Insulation Resistance

1,000 megohms minimum @ 25°C

### TYPICAL ELECTRICAL PERFORMANCE

#### Size 8 PC Tail Triax Contacts

Contact Resistance:

Center @ 1 Amp, 55 millivolts max. voltage drop @ 25°C

Intermediate @ 1 Amp, 55 millivolts max. voltage drop @ 25°C

Outer @ 1 Amp, 55 millivolts max. voltage drop @ 25°C

Operating Frequency: 0–500 MHz

Dielectric Withstanding Voltage:

Center to Intermediate 500 VAC Rms @ Sea Level

Intermediate to Outer 500 VAC Rms @ Sea Level

Insulation Resistance

1,000 megohms minimum @ 25°C



Size 8, PC Tail Twinax Socket Contact for use in D38999 Connectors



D38999 Connector with PC Tail Coax Contacts, Sealing Plugs in unused contact cavities and PC Tail Alignment Disc

38999  
III  
II  
I  
SJT

26482  
Matrix 2

83723 III  
Matrix  
Pyle

5015  
Crimp Rear  
Release Matrix

26500 Pyle

Printed  
Circuit Board

EMI Filter  
Transient

Fiber Optics

High Speed  
Contacts

Options  
Others

### PC TAIL COAX, TWINAX, AND TRIAX CONTACTS FOR USE IN D38999 SERIES I & III CONNECTORS

| Size      | PC Tail Coax Contact Part Number | PC Tail Twinax Contact Part Number | PC Tail Triax Contact Part Number | Tails*                     | Comments                                            |
|-----------|----------------------------------|------------------------------------|-----------------------------------|----------------------------|-----------------------------------------------------|
| 8 Pin     | 21-33733-7                       |                                    |                                   | PCB 2 tails                |                                                     |
| 8 Pin     | 21-33733-2                       |                                    |                                   | PCB 2 tails                | For epoxy filled connector                          |
| 8 Pin     | 21-33733-4                       |                                    |                                   | PCB 2 tails                | For epoxy filled connector                          |
| 8 Pin     | 21-33733-5                       |                                    |                                   | PCB 4 outer tails, 1 inner |                                                     |
| 8 Pin     | 21-33733-9                       |                                    |                                   | PCB 2 tails                |                                                     |
| 8 Pin     | 21-33733-8                       |                                    |                                   | PCB 2 tails                |                                                     |
| 8 Socket  | 21-33426-1                       |                                    |                                   | PCB 2 tails                |                                                     |
| 8 Pin     |                                  | 21-33967-115                       |                                   | PCB 3 tails                | M39029/90/91 Interface                              |
| 8 Pin     |                                  | 21-33967-125                       |                                   | PCB 3 tails                |                                                     |
| 8 Pin     |                                  | 21-33967-15                        |                                   | PCB 3 tails                |                                                     |
| 8 Pin     |                                  | 21-33967-45                        |                                   | PCB 3 tails                |                                                     |
| 8 Pin     |                                  | 21-33967-55                        |                                   | PCB 3 tails                |                                                     |
| 8 Pin     |                                  | 21-33967-65                        |                                   | PCB 3 tails                |                                                     |
| 8 Pin     |                                  | 21-33967-85                        |                                   | PCB 3 tails                |                                                     |
| 8 Pin     |                                  | 21-33967-95                        |                                   | PCB 3 tails                |                                                     |
| 8 Pin     |                                  | P-209550†                          |                                   | PCB 3 tails                |                                                     |
| 8 Pin     |                                  | P-209532-1                         |                                   | PCB 9 tails                |                                                     |
| 8 Pin     |                                  | P-209532-2                         |                                   | PCB 9 tails                |                                                     |
| 8 Socket  |                                  | 21-33921-15                        |                                   | PCB 3 tails                |                                                     |
| 8 Socket  |                                  | 21-33921-45                        |                                   | PCB 3 tails                |                                                     |
| 8 Socket  |                                  | 21-33921-35                        |                                   | PCB 3 tails                |                                                     |
| 8 Socket  |                                  | 21-33921-65                        |                                   | PCB 3 tails                |                                                     |
| 8 Socket  |                                  | 21-33921-75                        |                                   | PCB 3 tails                |                                                     |
| 8 Socket  |                                  | 21-33921-115†                      |                                   | PCB 3 tails                |                                                     |
| 8 Socket  |                                  | 21-33921-105†                      |                                   | PCB 3 tails                | M39029/90/91 Interface<br>.040 dia. tails           |
| 8 Socket  |                                  | DB-109002                          |                                   | PCB 2 tails                | M39029/91 Interface<br>Outer body grounded to shell |
| 8 Socket  |                                  | 21-33919-15                        |                                   | PCB 2 tails                |                                                     |
| 8 Socket  |                                  | 21-33919-25                        |                                   | PCB 2 tails                |                                                     |
| 8 Pin     |                                  |                                    | 21-33828-1                        | PCB 3 tails                |                                                     |
| 8 Pin     |                                  |                                    | 21-33828-21                       | PCB 3 tails                |                                                     |
| 8 Pin     |                                  |                                    | 21-33828-41                       | PCB 3 tails                |                                                     |
| 8 Socket  |                                  |                                    | 21-33840-1                        | PCB 3 tails                |                                                     |
| 8 Socket  |                                  |                                    | 21-33840-21                       | PCB 2 tails                | Outer body grounded to shell                        |
| 8 Socket  |                                  |                                    | 21-33841-1                        | PCB 2 tails                | Outer body grounded to shell                        |
| 10 Pin    |                                  | 21-33844-2†                        |                                   | PCB 2 tails                | Outer body grounded to shell                        |
| 12 Socket |                                  |                                    |                                   |                            |                                                     |

\* Consult Amphenol Aerospace for tail configurations and tail diameters.

† Consult Amphenol Aerospace for current release of this contact.

CONTACT ORDERING: Example number given in chart 21-33733-7 should be ordered as 21-033733-007; example number given in chart 21-33967-115 should be ordered as 21-033967-115; example number given in chart 21-33840-21 should be ordered as 21-033840-021. Adding Zeros is necessary for Amphenol ordering process on all contact numbers.

# Coax, Twinax & Triax PC Tail Contacts

## Application Data, cont.

| PCTAIL COAX, TWINAX, AND TRIAX CONTACTS FOR USE IN D38999 SERIES I & III CONNECTORS |                                  |                                    |                                   |                        |                                        |
|-------------------------------------------------------------------------------------|----------------------------------|------------------------------------|-----------------------------------|------------------------|----------------------------------------|
| Size                                                                                | PC Tail Coax Contact Part Number | PC Tail Twinax Contact Part Number | PC Tail Triax Contact Part Number | Tails*                 | Comments                               |
| 12 Pin                                                                              | 21-33686-8                       |                                    |                                   | PCB 2 tails            |                                        |
| 12 Pin                                                                              | 21-33686-9                       |                                    |                                   | PCB 2 tails            | Outer tail clip type                   |
| 12 Pin                                                                              | 21-33686-5                       |                                    |                                   | PCB 2 tails            |                                        |
| 12 Pin                                                                              | 21-33686-10                      |                                    |                                   | PCB 2 tails            |                                        |
| 12 Pin                                                                              | 21-33686-13                      |                                    |                                   | PCB 2 tails            | Outer tail clip type                   |
| 12 Pin                                                                              | 21-33687-6                       |                                    |                                   | PCB 2 tails            | For epoxy filled connector             |
| 12 Pin                                                                              | 21-33687-7                       |                                    |                                   | PCB 2 tails            |                                        |
| 12 Pin                                                                              | 21-33686-16†                     |                                    |                                   | PCB 2 tails            |                                        |
| 12 Socket                                                                           | 21-33614-1                       |                                    |                                   | PCB 2 tails            |                                        |
| 12 Socket                                                                           | 21-33614-21                      |                                    |                                   | PCB 2 tails            |                                        |
| 12 Socket                                                                           | 21-33614-41                      |                                    |                                   | PCB 2 tails            |                                        |
| 12 Socket                                                                           | 21-33611-3                       |                                    |                                   | PCB 2 tails            | Outer tail clip type                   |
| 12 Socket                                                                           | 21-33440-1                       |                                    |                                   | PCB 3 tails            |                                        |
| 12 Socket                                                                           | 21-33430-1                       |                                    |                                   | PCB 2 tails            | Outer tail clip type, M38999 Series II |
| 12 Socket                                                                           | 21-33430-21                      |                                    |                                   | PCB 2 tails            | M38999 Series II                       |
| 12 Socket                                                                           | 21-33430-41                      |                                    |                                   |                        | M38999 Series II                       |
| 12 Pin                                                                              |                                  | 21-33633-1†**                      |                                   | PCB 4 tails            | JN1104 Interface                       |
| 12 Pin                                                                              |                                  | 21-33633-2**                       |                                   | PCB 4 tails            |                                        |
| 12 Pin                                                                              |                                  | 21-33633-6**                       |                                   | PCB 4 tails            |                                        |
| 12 Pin                                                                              |                                  | 21-33633-7**                       |                                   | PCB 4 tails            |                                        |
| 12 Socket                                                                           |                                  | 21-33393-6**                       |                                   | PCB 4 tails            |                                        |
| 12 Socket                                                                           |                                  | 21-33393-5**                       |                                   | PCB 4 tails            |                                        |
| 12 Socket                                                                           |                                  | 21-33433-1**                       |                                   | PCB 4 tails            | M38999 Series II, JN1104 Interface     |
| 16 Pin                                                                              | 21-33856-15                      |                                    |                                   | PCB 2 tails            |                                        |
| 16 Pin                                                                              | 21-33856-25                      |                                    |                                   | PCB 90 degree, 2 tails |                                        |
| 16 Pin                                                                              | 21-33856-65                      |                                    |                                   | PCB 2 tails            |                                        |
| 16 Pin                                                                              | 21-33634-15                      |                                    |                                   | PCB 1 tail             | Outer body grounded to shell           |
| 16 Pin                                                                              | 21-33634-35                      |                                    |                                   | PCB 1 tail             | Outer body grounded to shell           |
| 16 Pin                                                                              | 21-33634-45                      |                                    |                                   | PCB 1 tail             |                                        |
| 16 Pin                                                                              | 21-33386-1                       |                                    |                                   | PCB 2 tails            |                                        |
| 16 Socket                                                                           | 21-33857-1                       |                                    |                                   | PCB 2 tails            |                                        |
| 16 Socket                                                                           | 21-33857-8                       |                                    |                                   | PCB 2 tails            |                                        |
| 16 Socket                                                                           | 21-33857-7                       |                                    |                                   | PCB 2 tails            |                                        |
| 16 Socket                                                                           | 21-33610-1                       |                                    |                                   | PCB 2 tails            |                                        |
| 16 Socket                                                                           | 21-33610-2                       |                                    |                                   | PCB 2 tails            |                                        |
| 16 Socket                                                                           | 21-33441-1                       |                                    |                                   | PCB 2 tails            |                                        |
| 16 Socket                                                                           | 21-33606-1                       |                                    |                                   | PCB 2 tails            |                                        |
| 16 Socket                                                                           | 21-33606-21†                     |                                    |                                   | PCB 2 tails            | M38999 Series II                       |
| 16 Socket                                                                           | 21-33606-31†                     |                                    |                                   | PCB 2 tails            |                                        |
| 16 Socket                                                                           | 21-33610-3                       |                                    |                                   | PCB 2 tails            |                                        |
| 16 Socket                                                                           | 21-33857-3                       |                                    |                                   | PCB 2 tails            |                                        |

\* Consult Amphenol Aerospace for tail configurations and tail diameters.

\*\* Size 12 twinax and triax contacts are interchangeable.

† Consult Amphenol Aerospace for current release of this contact.

CONTACT ORDERING: Example number given in chart 21-33633-7 should be ordered as 21-033633-007; example number given in chart 21-33686-10 should be ordered as 21-033686-010. Adding Zeros is necessary for Amphenol ordering process on all contact numbers.

38999  
III  
II  
I  
SJT

26482  
Matrix 2

83723 III  
Matrix  
Pyle

5015  
Crimp Rear  
Release Matrix

26500 Pyle

Printed  
Circuit Board

EMI Filter  
Transient

Fiber Optics

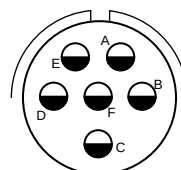
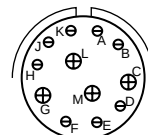
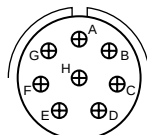
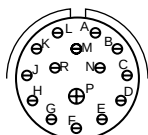
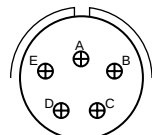
High Speed  
Contacts

Options  
Others

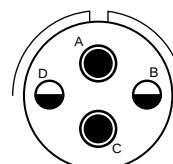
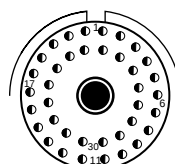
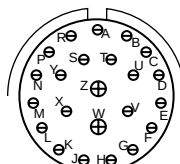
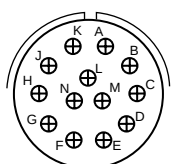
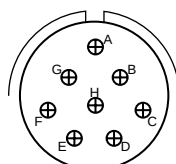
Front face of pin inserts illustrated



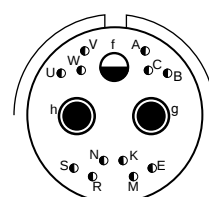
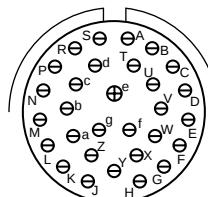
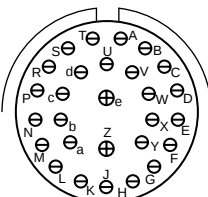
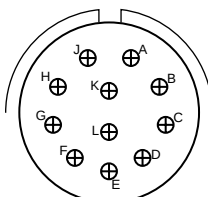
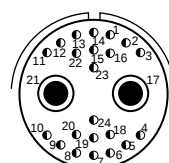
| Insert Arrangement | 9-5      | 10-2 | 11-2   | 12-3 | 13-3 | 12-4    | 13-4   | 14-4 | 15-4 |
|--------------------|----------|------|--------|------|------|---------|--------|------|------|
| Connector Series   | TV       | SJT  | LJT,TV | JT   | LJT  | JT, SJT | LJT,TV | JT   | LJT  |
| Service Rating     | Grounded | I    |        | II   |      | I       |        | I    |      |
| Number of Contact  | 1        | 2    |        | 3    |      | 4       |        | 4    |      |
| Contact Size       | 8 Twinax | 16   |        | 16   |      | 16      |        | 12   |      |



| Insert Arrangement            | 14-5    | 15-5   | 14-15   | 15-15  | 14-68 | 15-68 | 14-97   | 15-97  | 16-6    | 17-6   |
|-------------------------------|---------|--------|---------|--------|-------|-------|---------|--------|---------|--------|
| Available in Connector Series | JT, SJT | LJT,TV | JT, SJT | LJT,TV | JT    | LJT   | JT, SJT | LJT,TV | JT, SJT | LJT,TV |
| Service Rating                | II      |        | I       |        | I     |       | I       |        | I       |        |
| Number of Contact             | 5       |        | 14      | 1      | 8     |       | 8       | 4      | 6       |        |
| Contact Size                  | 16      |        | 20      | 16     | 16    |       | 20      | 16     | 12      |        |



| Insert Arrangement | 16-8    | 17-8   | 16-13   | 17-13 | 16-99   | 17-99  | 17-2 | 17-22 | 16-6 | 17-6 |
|--------------------|---------|--------|---------|-------|---------|--------|------|-------|------|------|
| Connector Series   | JT, SJT | LJT,TV | JT, SJT | LJT   | JT, SJT | LJT,TV | LJT  | TV    | LJT  | TV   |
| Service Rating     | II      |        | I       |       | I       |        | M    |       | Coax |      |
| Number of Contact  | 8       |        | 13      |       | 21      | 2      | 38   | 1     | 2    | 2    |
| Contact Size       | 16      |        | 16      |       | 20      | 16     | 22D  | 8     | 12   | 8    |



| Insert Arrangement | 17-25 | 18-11   | 19-11  | 18-28 | 19-28 | 18-30 | 19-30 | 19-31 |
|--------------------|-------|---------|--------|-------|-------|-------|-------|-------|
| Connector Series   | LJT   | JT, SJT | LJT,TV | JT    | LJT   | JT    | LJT   | TV    |
| Service Rating     | M     | II      |        | I     |       | I     |       | M     |
| Number of Contact  | 22    | 11      |        | 26    | 2     | 29    | 1     | 2     |
| Contact Size       | 22D   | 16      |        | 20    | 16    | 20    | 16    | 8     |

The insert arrangements shown on this page and the next page represent the most readily available patterns within the 38999 Circular Series. If you require other arrangements than what are shown here, consult Amphenol for further availability. In most cases, unless otherwise stated, size 8 and size 12 cavities can be filled with either coax, twinax, triax or power contacts.

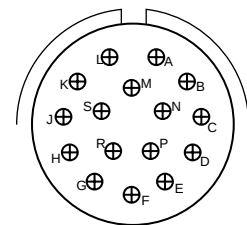
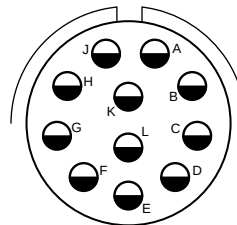
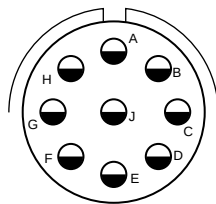
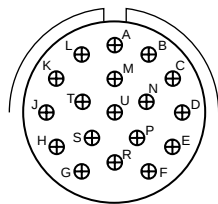
#### CONTACT LEGEND

|                            |                        |                            |               |       |       |
|----------------------------|------------------------|----------------------------|---------------|-------|-------|
|                            |                        |                            |               |       |       |
| 8                          | 10                     | 12                         | 16            | 20    | 22D   |
| Coax/Twinax/Triax or Power | Twinax/Triax/ or Power | Coax/Twinax/Triax or Power | Coax or Power | Power | Power |

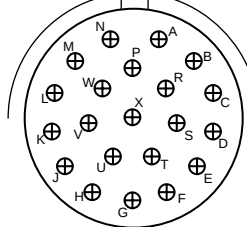
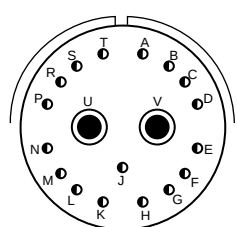
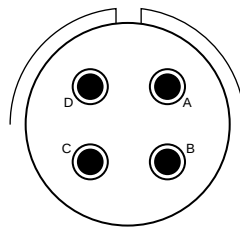
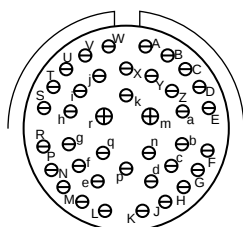
# Insert Patterns - MIL-DTL-38999

## Incorporating Coax, Twinax and Triax Contacts

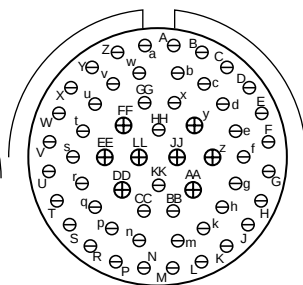
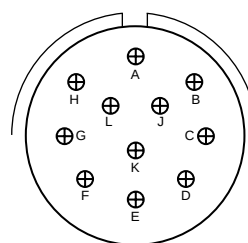
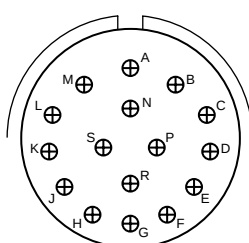
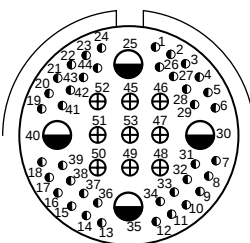
Front face of pin inserts illustrated



| Insert Arrangement | 18-68 | 19-68 | 18-96 | 20-11   | 21-11   | 20-16   | 21-16   |
|--------------------|-------|-------|-------|---------|---------|---------|---------|
| Connector Series   | JT    | LJT   | JT    | JT, SJT | LJT, TV | JT, SJT | LJT, TV |
| Service Rating     | I     |       | I     | I       |         | II      |         |
| Number of Contact  | 18    |       | 9     | 11      |         | 16      |         |
| Contact Size       | 16    |       | 12    | 12      |         | 16      |         |



| Insert Arrangement | 20-39   | 21-39   | 20-75 | 21-75   | 20-79 | 21-79 | 22-21   | 23-21   |
|--------------------|---------|---------|-------|---------|-------|-------|---------|---------|
| Connector Series   | JT, SJT | LJT, TV | SJT   | LJT, TV | SJT   | LJT   | JT, SJT | LJT, TV |
| Service Rating     | I       |         | M     |         | II    |       | II      |         |
| Number of Contact  | 37      | 2       | 4     |         | 17    |       | 21      |         |
| Contact Size       | 20      | 16      | 8     |         | 22D   |       | 16      |         |

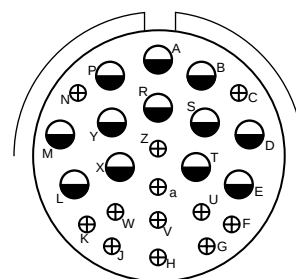
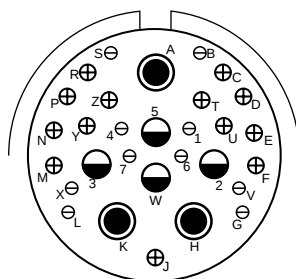
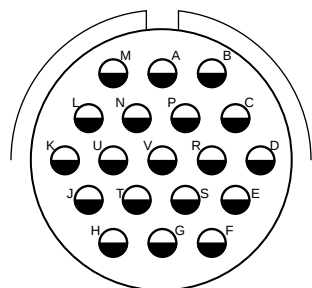


| Insert Arrangement | 23-54 | 23-97 | 23-99 | 24-4    | 25-4    |
|--------------------|-------|-------|-------|---------|---------|
| Connector Series   | TV    | LJT   | LJT   | JT, SJT | LJT, TV |
| Service Rating     | M     | II    | II    | I       |         |
| Number of Contact  | 40    | 9     | 11    | 48      | 8       |
| Contact Size       | 22D   | 16    | 16    | 20      | 16      |

### CONTACT LEGEND

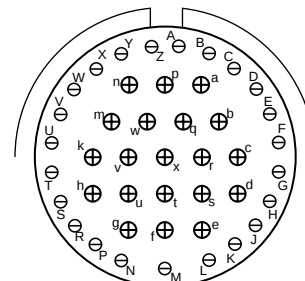
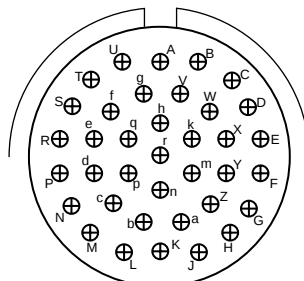
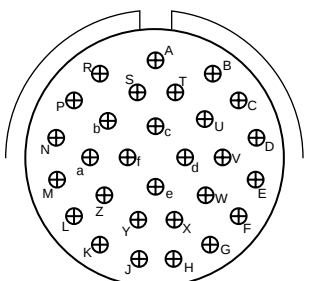
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|----------------------------|-----------------------|----------------------------|---------------|-------|-------|
|                            |                       |                            |               |       |       |
| 8                          | 10                    | 12                         | 16            | 20    | 22D   |
| Coax/Twinax/Triax or Power | Twinax/Triax or Power | Coax/Twinax/Triax or Power | Coax or Power | Power | Power |

|     |       |          |        |                |       |               |            |              |            |
|-----|-------|----------|--------|----------------|-------|---------------|------------|--------------|------------|
| III | 38999 | 26482    | 83723  | 5015           | 26500 | Printed       | EMI Filter | Fiber Optics | High Speed |
| II  |       | Matrix 2 | Matrix | Crimp Rear     | Pyle  | Circuit Board | Transient  |              | Contacts   |
| I   |       |          |        | Release Matrix |       |               |            |              |            |
| SJT |       |          |        |                |       |               |            |              | Options    |
|     |       |          |        |                |       |               |            |              | Others     |

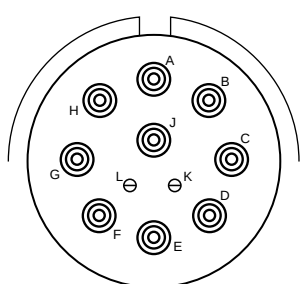
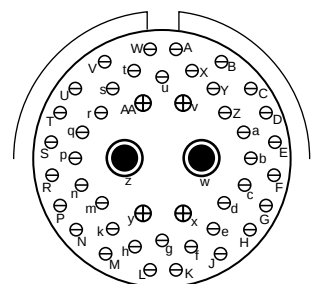


| Insert Arrangement | 24-19   | 25-19   | 24-20 | 25-20*  | 24-24   | 25-24   |
|--------------------|---------|---------|-------|---------|---------|---------|
| Connector Series   | JT, SJT | LJT, TV | SJT   | LJT, TV | JT, SJT | LJT, TV |
| Service Rating     |         | I       |       | N       |         | I       |
| Number of Contact  |         | 19      | 10    | 13      | 12      | 12      |
| Contact Size       |         | 12      | 20    | 16      | 16      | 12      |

(Locations U and Y - Dedicated to Fiber Optics)



| Insert Arrangement | 24-29   | 25-29   | 24-37   | 25-37   | 24-43   | 25-43   |
|--------------------|---------|---------|---------|---------|---------|---------|
| Connector Series   | JT, SJT | LJT, TV | JT, SJT | LJT, TV | JT, SJT | LJT, TV |
| Service Rating     |         | I       |         | I       |         | I       |
| Number of Contact  |         | 29      |         | 37      | 23      | 20      |
| Contact Size       |         | 16      |         | 16      | 20      | 16      |



| Insert Arrangement | 24-46 | 25-46   | 25-11*  |
|--------------------|-------|---------|---------|
| Connector Series   | SJT   | LJT, TV | LJT, TV |
| Service Rating     |       | I       | N       |
| Number of Contact  | 40    | 4       | 2       |
| Contact Size       | 20    | 16      | 8       |

\* For use in MIL-STD-1760 applications with MIL-DTL-38999 Series III.

#### CONTACT LEGEND

|                            |                       |                            |               |       |       |
|----------------------------|-----------------------|----------------------------|---------------|-------|-------|
|                            |                       |                            |               |       |       |
| 8                          | 10                    | 12                         | 16            | 20    | 22D   |
| Coax/Twinax/Triax or Power | Twinax/Triax or Power | Coax/Twinax/Triax or Power | Coax or Power | Power | Power |