

# Interconnect Solutions for Aircraft Data Network Systems

ITT now offers interconnect solutions for the commercial avionics ARINC 664 Ethernet LAN installations, either 10BASE-T or 100BASE-TX.

ITT's offering includes a multi-pin Cannon Quadrax contact for use in ARINC 600, ARINC 404, and Mil-DTL 38999 series III connectors. The Quadrax contact, designed to ARINC 600 requirements, is a size 8 multi-pin contact providing four signal pins to yield a single Ethernet port. The details of the size 8 Quadrax contact are defined in Attachment 20 to ARINC Specification 600. Since the Quadrax contact must be keyed within the connector insert, it requires Ethernet application specific inserts. The crimp version of the size 8 Quadrax contact terminates a 100-ohm, "Star Quad" cable. Guidelines for the cable characteristics and insert arrangements utilizing the size 8 quadrax contacts are defined also in the ARINC Specification 600.



In addition, ITT has developed a size 5 "Quadrax" contact for use in ARINC 404 and MIL-C-81659 connectors. This contact terminates the same "Star Quad" cable as the size 8 "Quadrax" contact and its use requires modification to any standard insert containing size 5 contact cavities.



For a detailed overview of Quadrax technology, please refer to the Interconnect Solutions White Paper titled "Quadrax Technology White Paper," available for download on our website, [www.ittcannon.com](http://www.ittcannon.com).

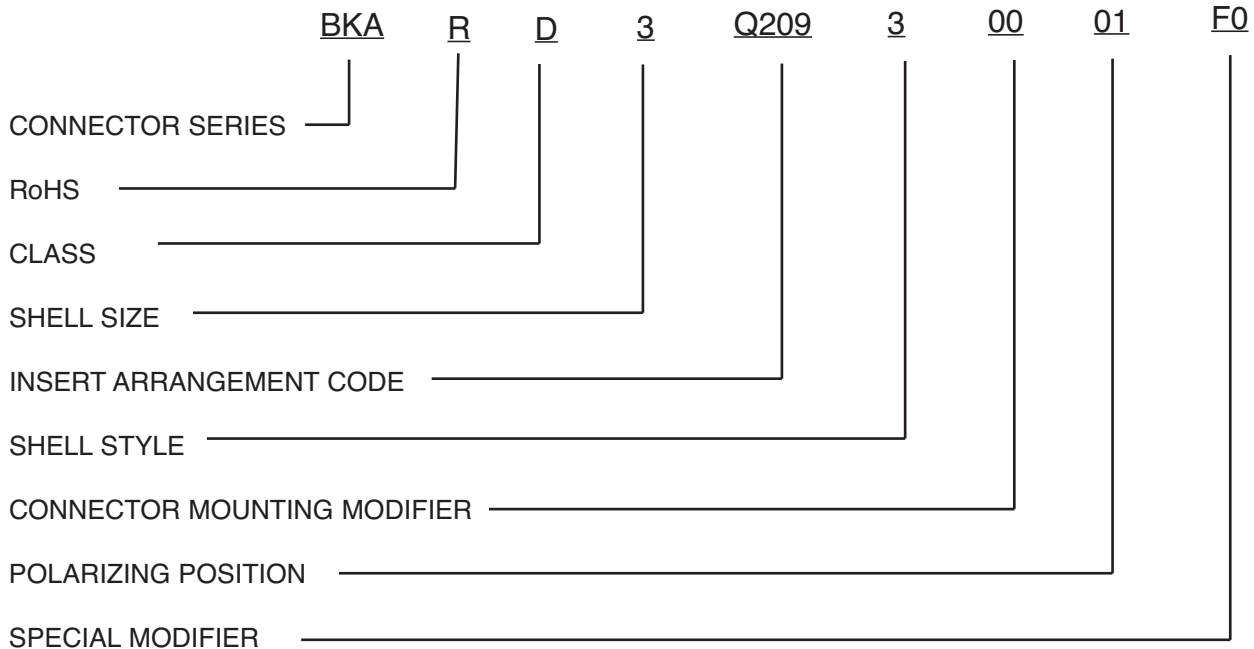
## Electrical Performance (Typical)

Attenuation (Maximum)	
Frequency (MHz)	Attenuation (dB)
1.00	0.01
4.00	0.03
10.00	0.03
16.00	0.03
20.00	0.03
32.25	0.04
32.50	0.10
100.00	0.30

Cross Talk (NEXT) Minimum	
Frequency (MHz)	Attenuation (dB)
1.00	65
4.00	65
10.00	60
16.00	56
20.00	54
32.25	50
32.50	44
100.00	40

Return Loss (Minimum)	
Frequency (MHz)	Attenuation (dB)
1.00	23
4.00	23
10.00	23
16.00	23
20.00	14
32.25	14
32.50	14
100.00	14

How to Order Rack and Panel Connectors



CONNECTOR SERIES  
 BKA - Rack and Panel Connector per ARINC 600 Requirements  
 (Standard Shell finish: Light Yellow Chromate Conversion)

**Class**

**C Semi-Environmental**

Connector contains removable inserts with sealing grommets.  
 Inserts accommodate rear-release, rear-removable crimp contacts.  
 Plug connector shells are supplied without peripheral o-ring seals.

**D Non-Environmental**

Connector contains removable inserts without sealing grommets.  
 Inserts accommodate rear-release, rear-removable crimp contacts.

**E Environmental**

Connector contains non-removable inserts with sealing grommets, bonded in the shell.  
 Inserts accommodate rear-release, rear-removable crimp contacts.  
 Plug connector shells are supplied with peripheral o-ring seals.

**F Front Release; Non-Environmental (Receptacle Connectors Only)**

Connector contains removable inserts without sealing grommets.  
 Insert arrangements accommodate front release, front removable solder post contacts and rear release-rear removable crimp contacts.

**X Front Release; Non-Environmental (Receptacle Connectors Only)**

Connector contains removable inserts without sealing grommets.

**All inserts in the connector** accommodate front release, front removable solder post contacts.

**NOTE:** An "R" after the connector series would mean supplied with RoHS compliant finish.

**Shell Size**

Size 2 Accommodates Maximum 28 size 8 Quadrax contacts

Size 3 Accommodates Maximum 56 Size 8 Quadrax contacts



Connector	Shell Cavity Identification					
Layout	A	B	C	D	E	F
Q035	11Q11	11Q11	13Q2			
Q074	4W4	11Q11	59			
Q075	11Q11	BLANK	64Q2			
Q086	11Q11	11Q11	64Q2			
Q089	4W4	BLANK	85			
Q096	BLANK	11Q11	85			
Q69	11Q11	24	34			
Q81	11Q11	11Q11	59			
Q107	11Q11	11Q11	85			
Q135	11Q11	24	100			
Q144	120T2	11Q11	13W2			
Q154	120T2	11Q11	13W2			
Q174	150	11Q11	13W2			
Q198	11Q11	11Q11	13Q2	11Q11	11Q11	13Q2
Q209	11Q11	11Q11	BLANK	11Q11	150	13Q2
Q225	11Q11	150	64Q2			
Q246	150	11Q11	85			
Q253	120T2	120T2	13WQ2			
Q253	150	121	13W2	11Q11	24	34
Q261	4W4	120T2	BLANK	4W4	120T2	13Q2
Q264	120T2	120T2	24Q4			
Q274	4W4	120T2	13Q2	4W4	120T2	13Q2
Q307	110	11Q11	6Q6	24	150	6Q6
Q313	150	150	13WQ2			
Q324	150	150	24Q4			
Q324	11Q11	METAL BLK	BLANK	150	150	13Q2
Q435	11Q11	11Q11	13Q2	150	150	100
Q487	11Q11	150	13Q2	150	150	13Q2
Q619	150	150	13Q2	150	150	6T6
Q626	150	150	13Q2	150	150	13Q2
QA096	11Q11	BLANK	85			
QA324	11Q11	METAL BLK	BLANK	150	150	13W2
<b>ADDITIONAL DESIGNS AVAILABLE UPON REQUEST</b>						

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 Insert Arrangement Code
 

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See ITT Cannon website [www.ittcannon.com](http://www.ittcannon.com) when new Insert Arrangement code is required. For rack and panel on-line catalog go to literature/literature by product/rack and panel/view PDF.

**Q** prefix denotes Quadrax contacts and inserts arrangements are used in this connector arrangement. Quadrax contact cavities will accommodate size 8 twinax and coax contacts of a similar type (i.e. front release, front removal or rear release, rear removal types).

**For Quadrax contact and cable recommendations see ARINC 600 Specification.**

**Shell Style**

- 3 Plug (Mounts on the Rack)
- 4 Receptacle (Mounts on the LRU)

**Connector Mounting Modifier**

- 00** Plug and Receptacle Connectors  
.148 dia. connector mounting holds (This is a standard configuration)
- 01** Plug and Receptacle Connectors  
With #6 (.138)- 32 ESNA clinch nuts (See table for quantities)
- 03** Plug and Receptacle Connectors  
With #4 (.112)- 32 ESNA clinch nuts (See table for quantities)
- 08** Size 2 and 3 Plug and Receptacle Connectors Only  
With #4 (.112)- 32 ESNA clinch nuts in all connector mounting holes (See table for quantities)
- 09** Size 2 and 3 Plug and Receptacle Connectors Only  
With #6 (.138)- 32 ESNA clinch nuts in all connector mounting holes (See table for quantities)
- 10** Size 2 Plug and Receptacle Connectors Only  
With #4 (.112)- 340 ESNA clinch nuts installed in two mounting holes located between shell cavities "B" and "C"
- 11** Receptacle Connectors Only  
With #6 (.138)- 32 ESNA clinch nuts installed in two mounting holes located between shell cavities "B" and "C"
- 12** Size 2 Plug and Receptacle Connectors Only  
With six #4 (.112) clinch nuts (PEM #KFS2-440)
- 15** Plug and Receptacle Only  
With four #6 (.138)- 32 clinch nuts per MIL-N-45938/7 and clear cadmium shell finish
- 17** Receptacle Connectors Only  
Standard configuration with .0008-.0012 thick nickel plated shell
- 21** Plug and Receptacle Connectors  
Standard Configuration with clear cadmium over nickel plated shells
- 22** Plug Connectors Only  
Standard Configuration with .0008-.0012 thick nickel plated shell  
The shell is provided with with an EMI/Grounding spring.  
Metallic inserts, if supplied, are selectively plated- I.D. Silver; O.D Nickel over Silver.  
The contact retaining/grounding clips are gold plated.

## Insert Arrangement Code

**Connector Mounting Modifier (continued)**

- 23** Plug and Receptacle Connectors  
With floating eyelets (.048 min. radial float) in four corner connector mounting holes
- 24** Plug Connectors Only  
With #4 (.112)- 32 ESNA clinch nuts (See table for quantities)
- 26** Receptacle Connectors Only  
Standard Configuration with .0008-.0012 thick nickel plated shell.  
Non-environmental inserts- BKAD
- 29** Applies to both Plug and Receptacle meeting the definitions of the 22 and 17 mode codes.  
All mounting holes shall have #6-32 clinch nuts installed.
- 33** Plug Connectors Only  
Standard Configuration with .0008-.0012 thick nickel plated shells, but without  
EMI/Grounding springs
- 34** Plug Connectors Only  
Standard Configuration with .0008-.0012 thick nickel plated shells, but without  
EMI/Grounding springs and #6-32 clinch nuts installed as in mod code -01.
- 37** Plug Connectors Only  
With metric clinch nuts M3.5X6 (See table quantities)
- 38** Plug Connectors Only  
With metric clinch nuts M3.5X6 (See table quantities) and with .0008- .0012 thick nickel  
plated shell. The shell is provided with an EMI/Grounding spring. Metallic inserts, if  
supplied, are selectively plated- I.D. Silver; O.D. Nickel over Silver. The contact  
retaining/grounding clips are gold plated.
- 41** Plug Connectors Only is the -22 mod code (nickel plated with EMI springs) and #6-32 clinch  
nuts ESNA type same as standard mod code -01.
- 43** Plug Connectors Only is the -22 mod code (nickel plated with EMI springs) and #4-40 clinch  
nuts ESNA type same as standard mod code -03.

Mounting Modifier	Shell Size	Quantity of Clinch Nuts	
		Plug Connector	Receptacle Connector
01, 03, 24, 37, 38	2	4	6
	3	8	10
08, 09	2	8	10
	3	12	14

Insert Arrangement Code

**Polarizing Positions**

- Blank** Polarizing hardware is supplied with the connector, but is not installed.
- 00** Polarizing hardware is not supplied with the connector.
- 01-216** Polarizing hardware is installed in positions per ARINC 600.

**Special Modifier**

- Blank** Connector is supplied with full complement of power and signal crimp contacts. Quadrax, triax, twinax, and coax contacts are purchased separately.
- F0** Connector is supplied without contacts (**F0** is not marked on the connector)
- F00** Connector is supplied without contacts and without waveguide (**F00** is not marked on the connector)

	Solder Post Dia.	Solder Post Extension	Size 22 Contact Part Number	
			Receptacle Connector	Plug Connector
<b>SA</b>	0.025	.150	031-1352-000	030-3288-000
<b>SB</b>	0.025	.250	031-1352-001	030-3288-003
<b>SC</b>	0.025	.375	031-1352-002	030-3288-004
<b>SD</b>	0.025	.500	031-1352-003	030-3288-005

- W\*** Connector is supplied with full complement of signal (size 22) and power contacts per ARINC 600. Signal contacts are front release, front removable with wrap post termination installed in the connector. Power contacts are rear release, rear removable with crimp termination supplied uninstalled.

	Wrap Post Square	Wrap Post Extension	Size 22 Contact Part Number	
			Receptacle Connector	Plug Connector
<b>WA</b>	0.025	.250	031-1351-000	030-3310-000
<b>WB</b>	0.025	.375	031-1351-001	030-3310-001
<b>WC</b>	0.025	.500	031-1351-002	030-3310-002

Note: For ARINC 404 connectors due to the lack of industry standards governing the use of Quadrax contacts, unique part numbers will be assigned for each customer application until such time that a mutually accepted standard is adopted.

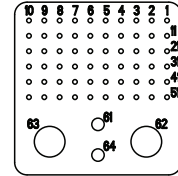
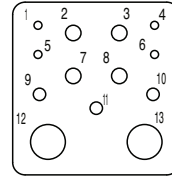
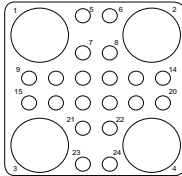
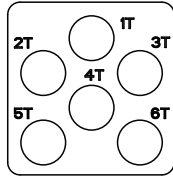
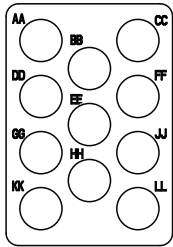


Insert Arrangements

*Insert Arrangements – the following inserts are currently available*

**ARINC 600 (BKA)**

<b>11Q11</b>	<b>6Q6</b>	<b>24T4</b>	<b>13Q2</b>	<b>64Q2</b>
Metallic	Metallic	4 Quadrax Contacts	2 Quadrax Contacts	2 Quadrax Contacts
11 Quadrax Contacts	6 Quadrax Contacts	20 #20 Contacts	4 #20HD Contacts	60 #22 Contacts
			3 #16 Contacts	2 #16 Contacts
			4 #12 Contacts	

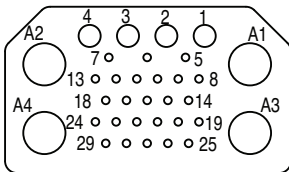


PIN FRONT  
ENGAGING FACE

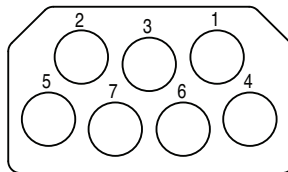
Note: Other ARINC Layouts under development. Consult factory for further details.

**ARINC 404, MIL-C-81659 (DPX)**

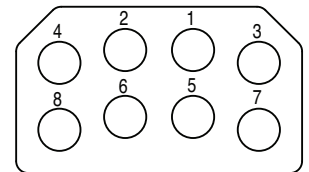
<b>33Q4M</b>	<b>7Q7</b>	<b>8Q8</b>
(4) #5 Quadrax Contacts	(7) #8 Quadrax Contacts	(8) #5 Quadrax Contacts
25 #20HD Contacts		
4 #16 contacts		



PIN FRONT  
ENGAGING FACE



PIN FRONT  
ENGAGING FACE



PIN FRONT  
ENGAGING FACE



Contact Data

Size 8 Quadrax – ARINC 600, ARINC 404, MIL-C-81659, MIL-DTL-38999			
Termination Type	Gender	Part Number	Type
Crimp***	Pin	224-0007-004	Rear Release/Rear Removable (RR-RR)
Crimp***	Socket	244-0011-000	Rear Release/Rear Removable (RR-RR)
Solder (PCB)	Pin	224-0007-000	Front Release/Front Removable* (FR-FR)
Solder (PCB)	Pin	224-0007-012	Front Release/Front Removable** (FR-FR)

\* .250 solder extension

\*\* .150 solder post extension

\*\*\* These contacts are designed to terminate 100 Ohm star Quad 24 AWG 100 Base-T Ethernet Cable with a max OD of .182. For other cable configurations consult factory.

Other PCB Solder configurations have been developed. Please contact Customer Service for further details.

Size 5 Quadrax – ARINC 404, MIL-C-81659 (33Q4M & 8Q8)			
Termination Type	Gender	Part Number	Type
Crimp (Cable)	Pin	224-0007-005	Rear Release/Rear Removable
Crimp (Cable)	Socket	244-0011-001	Rear Release/Rear Removable
Solder (PWB)	Pin	224-0007-000	Front Release/Front Removable

Crimping Tools		
	Tool Handle	Die Set/Positioner
Center Contact	M22520/5-01	M22510/2-37
Outer Body	M22520/5-01	M2252505-5-45A

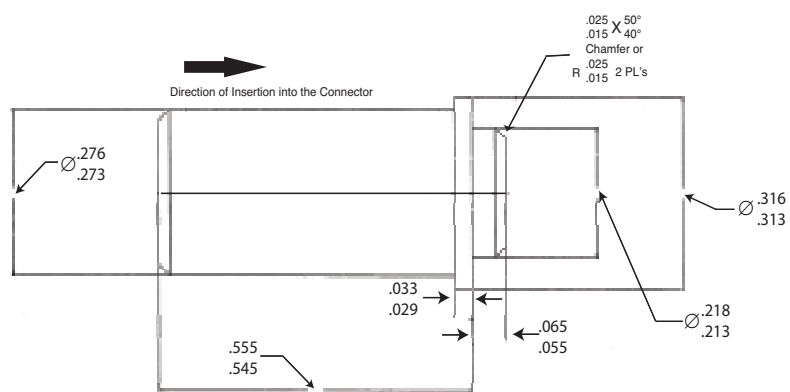
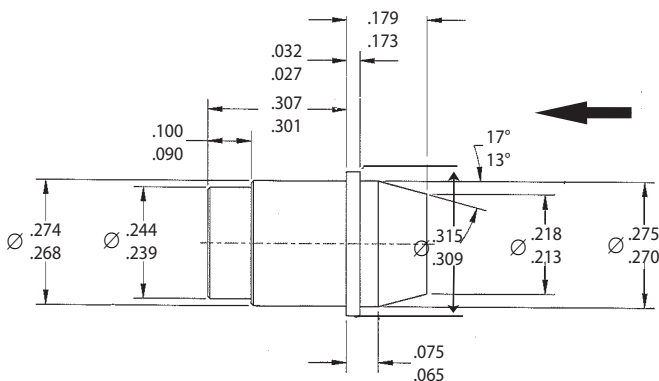
Insertion / Removal Tools				
Termination Type	Type	Contact Size	Insertion	Removal
Crimp (Cable)	RR-RR	8	None	Cannon Plastic Tool 323-7004-001
Crimp (Cable)	RR-RR	5	None	Cannon Plastic Tool 323-7011-000
Solder (PCB)	RR-RR	8	CIET 70369-8	CIET 70369-8

**Filler Plug (for pin or socket crimp contacts)**

Size 8, Aluminum Alloy with Nickel plating

For FR-FR Contacts Part Number 225-1065-001

For RR-RR Contacts Part Number 225-1066-000



Dimensions shown in inch (mm)  
Specifications and dimensions subject to change

www.ittcannon.com

