

Cabling Specifications for Cisco 4000 Series Routers

This appendix provides cable pinout descriptions for the Cisco 4000 series routers.

Note All pins not listed are not connected.

Following are the signal summaries contained in this appendix:

- EIA/TIA-232 console cable
- EIA/TIA-232 auxiliary cable
- Serial DTE and DCE EIA/TIA-232 cables
- Serial DTE and DCE EIA/TIA-449 cables
- Serial DTE and DCE V.35 cables
- Serial DTE and DCE X.21 cables
- Serial DTE EIA-530 cable
- E1-G.703/G.704 cable
- Ethernet (AUI) cable
- RJ-45 (10BaseT) cable
- Token Ring port
- BRI cable

EIA/TIA-232 Console and Auxiliary Port Pinouts

- Channelized T1 cable
- Channelized E1 cable

The cables available from Cisco meet Federal Communications Commission (FCC) part 15J Class A requirements and Verband Deutscher Electrotechniker (VDE) 0871 Limit B levels. When constructing your own cables, refer to the appropriate documentation regarding interference considerations and cable length limitations.

EIA/TIA-232 Console and Auxiliary Port Pinouts

Refer to Table B-1 when assembling an EIA/TIA-232 console cable or auxiliary port cable for the Cisco 4000-M and to Table B-2 when assembling an EIA/TIA-232 console cable or auxiliary port cable for the Cisco 4500-M and Cisco 4700-M.

Table B-1 Cisco 4000-M Console and Auxiliary Port Signals

Console Port			Auxiliary Port		
DCE DB-25 Connector			DCE DB-25 Connector		
Pin	Signal Name	Input/Output	Pin	Signal Name	Input/Output
1	Frame GND ¹	—	1	Frame GND	—
2	TXD	Input	2	TXD	Output
3	RXD	Output	3	RXD	Input
4	RTS	Shorted to pin 5	4	RTS	Output
5	CTS	Shorted to pin 4	5	CTS	Input
6	Shorted to pin 8	Output	7	GND	—
7	GND	—	8	CD	Input
8	CD ²	Output	20	DTR	Output
20	DTR	Input	22	Ring Indicator	Input

1. GND = Ground

2. CD = Carrier Detect

Table B-2 Cisco 4500-M and Cisco 4700-M Console Port Signals

Console Port		
DCE DB-25 Connector		
Pin	Signal Name	Direction
1	Frame Ground	–
2	Received Data	Input
3	Transmitted Data	Output
4	Request To Send	Looped to Clear To Send
5	Clear To Send	Looped to Request To Send
6	Connected to Pin 8	Output
7	Signal Ground	–
8	Data Carrier Detect	Output
20	Data Terminal Ready	Input

Table B-3 Cisco 4500-M and Cisco 4700-M Auxiliary Port Signals

Auxiliary Port		
DCE DB-25 Connector		
Pin	Signal Name	Direction
1	Frame Ground	–
2	Transmitted Data	Output
3	Received Data	Input
4	Request To Send	Output
5	Clear To Send	Input
7	Signal Ground	–
8	Data Carrier Detect	Input
20	Data Terminal Ready	Output

Serial Cable Pinouts

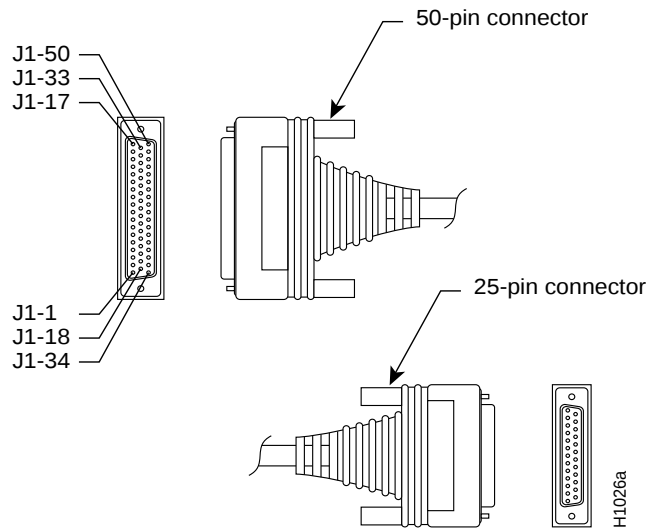
All interface types except EIA-530 are available in DTE or DCE format: DTE with a plug connector at the network end and DCE with a receptacle at the network end. V.35 is available in either mode with either gender at the network end. EIA-530 is available in DTE only.

The tables that follow list the signal pinouts for both the DTE-mode and DCE-mode serial port adapter cables for each serial interface type.

Note All four-port serial network processor modules use a universal high-density, 60-pin receptacle; all of the older dual serial network processor modules use a 50-pin receptacle. Each universal port requires a serial port adapter cable that determines the port's electrical interface type and mode: DTE or DCE. Although all port adapter cables use a universal plug at the quad serial module end, the network end of each cable type uses the physical connectors commonly used for the interface. (For example, the network end of the EIA/TIA-232 port adapter cable is a DB-25 connector, the most widely used EIA/TIA-232 connector.) The dual serial and four-port serial module pinouts are listed separately.

EIA/TIA-232 Dual Serial Module Cable Assembly

Figure B-1 shows the dual serial module EIA/TIA-232 cable assembly. Table B-4 lists the DTE and DCE pinouts.

Figure B-1 Dual Serial EIA/TIA-232 Cable Assembly**Table B-4 Dual Serial Module EIA/TIA-232 DTE and DCE Serial Cable Pinouts**

72-0670-01 DTE Connections			72-0736-01 DCE Connections			
50 Pin	25 Pin	Type	50 Pin	25 Pin	Signal	Type
J1-3	J1-36		J1-3	J1-36	MUX	
J1-39	J2-5	Twisted pair	J1-47	J2-24	SCTE	Twisted pair
J1-40	J2-4		J1-17	J1-38	DCE	
J1-9	J2-8	Twisted pair	J1-40	J2-5	CTS	Twisted pair
J1-42	J2-6		J1-39	J2-4	RTS	
J1-11	J2-2	Twisted pair	J1-14	J2-8	DCD	Twisted pair
J1-44	J2-7		J1-30	J2-6	DSR	

Serial Cable Pinouts

72-0670-01 DTE Connections			72-0736-01 DCE Connections			
50 Pin	25 Pin	Type	50 Pin	25 Pin	Signal	Type
J1-46	J2-3	Twisted pair	J1-46	J2-2	TXD	Twisted pair
J1-30	J2-20		J1-44	J2-7	GND	
J1-14	J2-18	Twisted pair	J1-11	J2-3	RXD	Twisted pair
J1-47	J2-17		J1-42	J2-20	DTR	
J1-31	J2-15	Twisted pair	J1-9	J2-18	LTST	Twisted pair
J1-15	J2-1		J1-23	J2-17	RXC	
J1-16	J2-24	Twisted pair	J1-16	J2-15	TXC	Twisted pair
			J1-15	J2-1	Chassis ground	

EIA/TIA-232 Four-Port Serial Module Cable Assembly

Figure B-2 shows the four-port serial module EIA/TIA-232 cable assembly; Table B-5 lists the DTE pinouts; and Table B-6 lists the DCE pinouts. Arrows indicate signal direction: —> indicates DTE to DCE, and <— indicates DCE to DTE.

Figure B-2 EIA/TIA-232 Cable Assembly

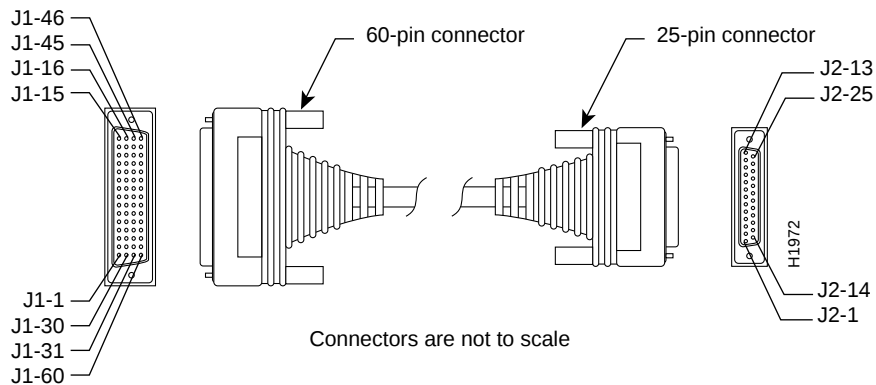


Table B-5 Four-Port Serial EIA/TIA-232 DTE Cable Pinouts (DB-60 to DB-25)

60 Pin	Signal	Note	Direction	25 Pin	Signal
J1-50	MODE_0	Shorting group	—	—	—
J1-51	GND				
J1-52	MODE_DC E				
J1-46	Shield GND	Single	—	J2-1	Shield GND
J1-46	Shield GND	Single	—	J2-1	Shield GND
J1-41	TXD/RXD	Twisted pair no. 5	—>	J2-2	TXD
Shield	—		—	Shield	—
J1-36	RXD/TXD	Twisted pair no. 9	<—	J2-3	RXD
Shield	—		—	Shield	—
J1-42	RTS/CTS	Twisted pair no. 4	—>	J2-4	RTS
Shield	—		—	Shield	—
J1-35	CTS/RTS	Twisted pair no. 10	<—	J2-5	CTS
Shield	—		—	Shield	—
J1-34	DSR/DTR	Twisted pair no. 11	<—	J2-6	DSR
Shield	—		—	Shield	—
J1-45	Circuit GND	Twisted pair no. 1	—	J2-7	Circuit GND
Shield	—		—	Shield	—
J1-33	DCD/LL	Twisted pair no. 12	<—	J2-8	DCD
Shield	—		—	Shield	—
J1-37	TXC/NIL	Twisted pair no. 8	<—	J2-15	TXC
Shield	—		—	Shield	—
J1-38	RXC/TXCE	Twisted pair no. 7	<—	J2-17	RXC
Shield	—		—	Shield	—
J1-44	LL/DCD	Twisted pair no. 2	—>	J2-18	LTST
Shield	—		—	Shield	—
J1-43	DTR/DSR	Twisted pair no. 3	—>	J2-20	DTR
Shield	—		—	Shield	—
J1-39	TXCE/TXC	Twisted pair no. 6	—>	J2-24	TXCE
Shield	—		—	Shield	—

Serial Cable Pinouts

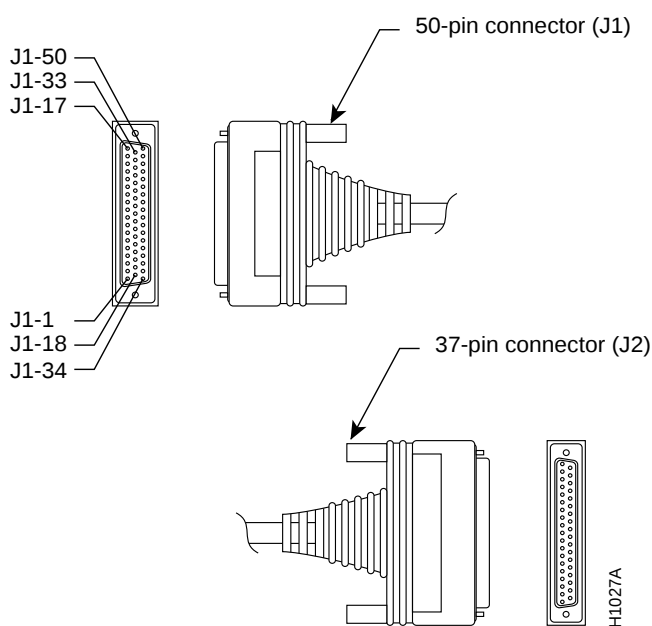
Table B-6 Four-Port Serial EIA/TIA-232 DCE Cable Pinouts (DB-60 to DB-25)

60 Pin	Signal	Note	Direction	25 Pin	Signal
J1-50 J1-51	MODE_0 GND	Shorting group	—	—	—
J1-36 Shield	RXD/TXD —	Twisted pair no. 9	<— —	J2-2 Shield	TXD —
J1-41 Shield	TXD/RXD —	Twisted pair no. 5	—> —	J2-3 Shield	RXD —
J1-35 Shield	CTS/RTS —	Twisted pair no. 10	<— —	J2-4 Shield	RTS —
J1-42 Shield	RTS/CTS —	Twisted pair no. 4	—> —	J2-5 Shield	CTS —
J1-43 Shield	DTR/DSR —	Twisted pair no. 3	—> —	J2-6 Shield	DSR —
J1-45 Shield	Circuit GND —	Twisted pair no. 1	— —	J2-7 Shield	Circuit GND
J1-44 Shield	LL/DCD —	Twisted pair no. 2	—> —	J2-8 Shield	DCD —
J1-39 Shield	TXCE/TXC —	Twisted pair no. 7	—> —	J2-15 Shield	TXC —
J1-40 Shield	NIL/RXC —	Twisted pair no. 6	—> —	J2-17 Shield	RXC —
J1-33 Shield	DCD/LL —	Twisted pair no. 12	<— —	J2-18 Shield	LTST —
J1-34 Shield	DSR/DTR —	Twisted pair no. 11	<— —	J2-20 Shield	DTR —
J1-38 Shield	RXC/TXCE —	Twisted pair no. 8	<— —	J2-24 Shield	TXCE —

EIA/TIA-449 Dual Serial Module Cable Assembly

Figure B-3 shows the dual serial module EIA/TIA-449 cable assembly. Table B-7 lists the DTE and DCE pinouts and signal descriptions.

Figure B-3 Dual Serial Module EIA/TIA-449 Cable Assembly



Serial Cable Pinouts

Table B-7 Dual Serial Module EIA/TIA-449 DTE and DCE Cable Pinouts

72-0672-01 DTE Connection Table			72-0738-01 DCE Connection Table			
50 Pin	37 Pin	Type	50 Pin	37 Pin	Type	Signal Name
J1-5	J1-38		J1-5	J1-38		MUX
J1-7	J2-10		J1-13	J2-10		LL
J1-1	J2-4	Twisted pair	J1-35	J2-4	Twisted pair	TXD+
J1-34	J2-22		J1-19	J2-22		TXD–
J1-2	J2-5	Twisted pair	J1-43	J2-5	Twisted pair	SCT+
J1-18	J2-23		J1-27	J2-23		SCT–
J1-35	J2-6	Twisted pair	J1-1	J2-6	Twisted pair	RXD+
J1-19	J2-24		J1-34	J2-24		RXD–
J1-4	J2-7	Twisted pair	J1-6	J2-7	Twisted pair	RTS+
J1-20	J2-25		J1-22	J2-25		RTS–
J1-37	J2-8	Twisted pair	J1-49	J2-8	Twisted pair	SCR+
J1-21	J2-26		J1-50	J2-26		SCR–
J1-22	J2-27	Twisted pair	J1-17	J1-44		DCE
J1-6	J2-9					
J1-8	J2-11	Twisted pair	J1-20	J2-27	Twisted pair	CTS–
J1-24	J2-29		J1-4	J2-9		CTS+
J1-41	J2-12	Twisted pair	J1-41	J2-11	Twisted pair	DSR+
J1-25	J2-30		J1-25	J2-29		DSR–
J1-10	J2-13	Twisted pair	J1-8	J2-12	Twisted pair	DTR+
J1-26	J2-31		J1-24	J2-30		DTR–
J1-43	J2-17	Twisted pair	J1-10	J2-13	Twisted pair	RLSD+
J1-27	J2-35		J1-26	J2-31		RLSD–
J1-36	J2-19	Twisted pair	J1-37	J2-17	Twisted pair	SCTE+
J1-15	J2-1		J1-21	J2-35		SCTE–
J1-44	J2-37	Twisted pair	J1-36	J2-19	Twisted pair	Ground
J1-48	J2-20		J1-15	J2-1		Chassis ground

EIA/TIA-449 Four-Port Serial Module Cable Assembly

Figure B-4 shows the four-port EIA/TIA-449 cable assembly; Table B-8 lists the DTE pinouts; Table B-9 lists the DCE pinouts. Arrows indicate signal direction: —> indicates DTE to DCE, and <— indicates DCE to DTE.

Figure B-4 EIA/TIA-449 Four-Port Module Cable Assembly

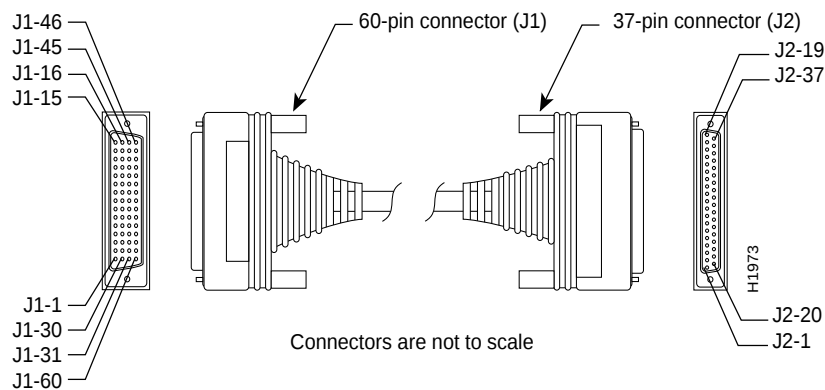


Table B-8 EIA/TIA-449 DTE Cable Pinouts (DB-60 to DB-37)

60 Pin	Signal Name	Note	Direction	37 Pin	Signal Name
J1-49	MODE_1	Shorting group	—	—	—
J1-48	GND				
J1-51	GND	Shorting group	—	—	—
J1-52	MODE_DCE				
J1-46	Shield_GND	Single	—	J2-1	Shield GND
J1-11	TXD/RXD+	Twisted pair no. 6	—>	J2-4	SD+
J1-12	TXD/RXD-		—>	J2-22	SD-
J1-24	TXC/RXC+	Twisted pair no. 9	<—	J2-5	ST+
J1-23	TXC/RXC-		<—	J2-23	ST-

Serial Cable Pinouts

60 Pin	Signal Name	Note	Direction	37 Pin	Signal Name
J1-28	RXD/TXD+	Twisted pair no. 11	<—	J2-6	RD+
J1-27	RXD/TXD—		<—	J2-24	RD—
J1-9	RTS/CTS+	Twisted pair no. 5	—>	J2-7	RS+
J1-10	RTS/CTS—		—>	J2-25	RS—
J1-26	RXC/TXCE+	Twisted pair no. 10	<—	J2-8	RT+
J1-25	RXC/TXCE—		<—	J2-26	RT—
J1-1	CTS/RTS+	Twisted pair no. 1	<—	J2-9	CS+
J1-2	CTS/RTS—		<—	J2-27	CS—
J1-44	LL/DCD	Twisted pair no. 12	—>	J2-10	LL
J1-45	Circuit_GND		—	J2-37	SC
J1-3	DSR/DTR+	Twisted pair no. 2	<—	J2-11	DM+
J1-4	DSR/DTR—		<—	J2-29	DM—
J1-7	DTR/DSR+	Twisted pair no. 4	—>	J2-12	TR+
J1-8	DTR/DSR—		—>	J2-30	TR—
J1-5	DCD/DCD+	Twisted pair no. 3	<—	J2-13	RR+
J1-6	DCD/DCD—		<—	J2-31	RR—
J1-13	TXCE/TXC+	Twisted pair no. 7	—>	J2-17	TT+
J1-14	TXCE/TXC—		—>	J2-35	TT—
J1-15	Circuit_GND	Twisted pair no. 9	—	J2-19	SG
J1-16	Circuit_GND		—	J2-20	RC

Table B-9 EIA/TIA-449 DCE Four-Port Cable Pinouts (DB-60 to DB-37)

60 Pin	Signal Name	Note	Direction	37 Pin	Signal Name
J1-49	MODE_1	Shorting group	—	—	—
J1-48	GND		—	—	—
J1-46	Shield_GND	Single	—	J2-1	Shield GND
J1-28	RXD/TXD+	Twisted pair no. 11	<—	J2-4	SD+
J1-27	RXD/TXD—		<—	J2-22	SD—

60 Pin	Signal Name	Note	Direction	37 Pin	Signal Name
J1-13	TXCE/TXC+	Twisted pair no. 7	—>	J2-5	ST+
J1-14	TXCE/TXC-		—>	J2-23	ST-
J1-11	TXD/RXD+	Twisted pair no. 6	—>	J2-6	RD+
J1-12	TXD/RXD-		—>	J2-24	RD-
J1-1	CTS/RTS+	Twisted pair no. 1	<—	J2-7	RS+
J1-2	CTS/RTS-		<—	J2-25	RS-
J1-24	TXC/RXC+	Twisted pair no. 9	—>	J2-8	RT+
J1-23	TXC/RXC-		—>	J2-26	RT-
J1-9	RTS/CTS+	Twisted pair no. 5	—>	J2-9	CS+
J1-10	RTS/CTS-		—>	J2-27	CS-
J1-29	NIL/LL	Twisted pair no. 12	—>	J2-10	LL
J1-30	Circuit_GND		—	J2-37	SC
J1-7	DTR/DSR+	Twisted pair no. 4	—>	J2-11	DM+
J1-8	DTR/DSR-		—>	J2-29	DM-
J1-3	DSR/DTR+	Twisted pair no. 2	<—	J2-12	TR+
J1-4	DSR/DTR-		<—	J2-30	TR-
J1-5	DCD/DCD+	Twisted pair no. 3	—>	J2-13	RR+
J1-6	DCD/DCD-		—>	J2-31	RR-
J1-26	RXC/TXCE+	Twisted pair no. 10	<—	J2-17	TT+
J1-25	RXC/TXCE-		<—	J2-35	TT-
J1-15	Circuit_GND	Twisted pair no. 8	—	J2-19	SG
J1-16	Circuit_GND		—	J2-20	RC

V.35 Dual Serial Module Cable Assembly

Figure B-5 shows the dual serial module V.35 cable assembly with the resistor (1/4 watt, $\pm 1\%$, 301 ohms). Table B-10 lists the DTE pinouts; Table B-11 lists the DCE pinouts. Arrows indicate signal direction: —> indicates DTE to DCE, and <— indicates DCE to DTE.

Figure B-5 Dual Serial Module V.35 Cable Assembly

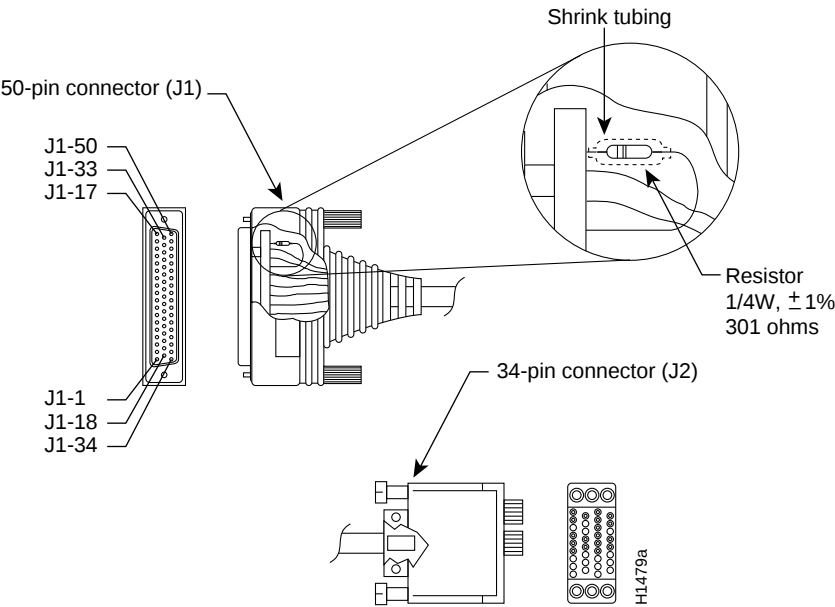


Table B-10 Dual Serial Module V.35 DTE Cable Pinouts

72-0671-02 DTE Connections				
50 Pin	34 Pin	Type	Signal Name	Direction
J1-3	J1-36	Jumper	MUX	To ground
J1-5	J1-38	Jumper	MUX	To ground
J1-14	J2-K	Twisted pair	LTST	—>
J1-Shield	J2-Shield		Not used	
d	d			

72-0671-02 DTE Connections				
50 Pin	34 Pin	Type	Signal Name	Direction
J1-2	J2-Y	Twisted pair	SCT+	<—
J1-18	J2-AA		SCT-	<—
J1-12	J2-P	Twisted pair	TXD+	—>
J1-28	J2-S		TXD-	—>
J1-35	J2-R	Twisted pair	RXD+	<—
J1-19	J2-T		RXD-	<—
J1-37	J2-V	Twisted pair	SCR+	<—
J1-21	J2-X		SCR-	<—
J1-45	J2-U	Twisted pair	SCTE+	—>
J1-29	J2-W		SCTE-	—>
J1-42	J2-E	Twisted pair	DSR	<—
J1-Shield	J2-Shield		Not used	
J1-9	J2-F	Twisted pair	RLSD	<—
J1-48	J2-A		Ground	<—
J1-40	J2-C	Twisted pair	RTS	—>
J1-Shield	J2-Shield		Not used	
J1-2	J1-3	Resistor	SCT+	R to
J1-18	J1-5	Resistor	SCT-	Ground
J1-35	J1-36	Resistor	RXD+	R to
J1-19	J1-38	Resistor	RXD-	Ground
J1-37	J1-44	Resistor	SCR+	R to
J1-21	J1-48	Resistor	SCR-	Ground
J1-30	J2-H	Twisted pair	DTR	—>
J1-44	J2-B		Ground	—>
J1-39	J2-D	Twisted pair	CTS	—>
J1-Shield	J2-Shield		Not used	

Serial Cable Pinouts

72-0671-02 DTE Connections

50 Pin	34 Pin	Type	Signal Name	Direction
J1-Shield	J2-Shield	Twisted pair	Not used	
d	d		Not used	
J1-Shield	J2-Shield			
d	d			
J1-Shield	J2-Shield	Single	Not used	
d	d			

Table B-11 Dual Serial Module V.35 DCE Cable Pinouts

72-0740-02 DCE Connections

50 Pin	34 Pin	Type	Signal Name	Direction
J1-3	J1-36	Jumper	MUX	To ground
J1-5	J1-38	Jumper	MUX	To ground
J1-9	J2-K	Twisted pair	LTST	<—
J1-Shield	J2-Shield			
d	d			
J1-45	J2-Y	Twisted pair	SCT+	—>
J1-29	J2-AA		SCT—	—>
J1-35	J2-P	Twisted pair	TXD+	<—
J1-19	J2-S		TXD—	<—
J1-12	J2-R	Twisted pair	RXD +	—>
J1-28	J2-T		RXD—	—>
J1-32	J2-V	Twisted pair	SCR+	—>
J1-33	J2-X		SCR—	—>
J1-37	J2-U	Twisted pair	SCTE+	<—
J1-21	J2-W		SCTE—	<—
J1-30	J2-E	Twisted pair	DSR	—>
J1-Shield	J2-Shield			
d	d			
J1-14	J2-F	Twisted pair	RLSD	—>
J1-48	J2-A		Ground	—>

72-0740-02 DCE Connections

50 Pin	34 Pin	Type	Signal Name	Direction
J1-39	J2-C	Twisted pair	RTS	<—
J1-Shield	J2-Shield		Not used	
d	d			
J1-17	J1-5	Jumper	DCE Mode	To ground
J1-Shield	J2-Shield	Single	Not used	
d	d			
J1-35 ¹	J1-36	Resistor	TXD+	R to ground
J1-19	J1-38	Resistor	TXD—	
J1-37	J1-44	Resistor	SCTE+	R to ground
J1-21	J1-48	Resistor	SCTE—	
J1-42	J2-H	Twisted pair	DTR	<—
J1-44	J2-B		Ground	<—
J1-40	J2-D	Twisted pair	CTS	—>
J1-Shield	J2-Shield		Not used	
d	d			
J1-Shield	J2-Shield	Twisted pair		
d	d			
J1-Shield	J2-Shield			
d	d			

1. See Figure B-5. Resistor = 1/4W, $\pm 1\%$, 301 ohms.

V.35 Four-Port Serial Module Cable Assembly

Figure B-6 shows the V.35 cable assembly; Table B-12 lists the DTE pinouts; Table B-13 lists the DCE pinouts. Arrows indicate signal direction: —> indicates DTE to DCE, and <— indicates DCE to DTE.

Figure B-6 Four-Port Serial Module V.35 Cable Assembly

Serial Cable Pinouts

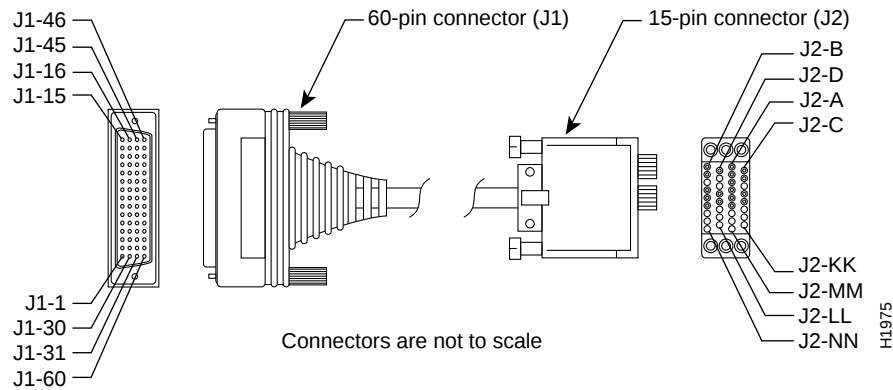


Table B-12 Four-Port Serial Module V.35 DTE Cable Pinouts (DB-60 to Winchester-Type 34 Pin)

60 Pin	Signal Name	Type	Direction	34 Pin	Signal Name
J1-49 J1-48	MODE_1 GND	Shorting group	—	—	—
J1-50 J1-51 J1-52	MODE_0 GND MODE_DCE	Shorting group	—	—	—
J1-53 J1-54 J1-55 J1-56	TXC/NIL RXC_TXCE RXD/TXD GND	Shorting group	—	—	—
J1-46	Shield_GND	Single	—	J2-A	Frame GND
J1-45 Shield	Circuit_GND —	Twisted pair no. 12	— —	J2-B Shield	Circuit GND —
J1-42 Shield	RTS/CTS —	Twisted pair no. 9	—> —	J2-C Shield	RTS —
J1-35 Shield	CTS/RTS —	Twisted pair no. 8	<— —	J2-D Shield	CTS —

Serial Cable Pinouts

60 Pin	Signal Name	Type	Direction	34 Pin	Signal Name
J1-34 Shield	DSR/DTR —	Twisted pair no. 7	<— —	J2-E Shield	DSR —
J1-33 Shield	DCD/LL —	Twisted pair no. 6	<— —	J2-F Shield	RLSD —
J1-43 Shield	DTR/DSR —	Twisted pair no. 10	—> —	J2-H Shield	DTR —
J1-44 Shield	LL/DCD —	Twisted pair no. 11	—> —	J2-K Shield	LT —

Serial Cable Pinouts

60 Pin	Signal Name	Type	Direction	34 Pin	Signal Name
J1-18	TXD/RXD+	Twisted pair no. 1	—>	J2-P	SD+
J1-17	TXD/RXD–		—>	J2-S	SD–
J1-28	RXD/TXD+	Twisted pair no. 5	<—	J2-R	RD+
J1-27	RXD/TXD–		<—	J2-T	RD–
J1-20	TXCE/TXC+	Twisted pair no. 2	—>	J2-U	SCTE+
J1-19	TXCE/TXC–		—>	J2-W	SCTE–
J1-26	RXC/TXCE+	Twisted pair no. 4	<—	J2-V	SCR+
J1-25	RXC/TXCE–		<—	J2-X	SCR–
J1-24	TXC/RXC+	Twisted pair no. 3	<—	J2-Y	SCT+
J1-23	TXC/RXC–		<—	J2-AA	SCT–

Table B-13 Four-Port Serial V.35 DCE Cable Pinouts (DB-60 to Winchester-Type 34 Pin)

60 Pin	Signal Name	Type	Direction	34 Pin	Signal Name
J1-49 J1-48	MODE_1 GND	Shorting group	–	–	–
J1-50 J1-51	MODE_0 GND		–	–	–
J1-53 J1-54 J1-55 J1-56	TXC/NIL RXC_TXCE RXD/TXD GND	Shorting group	–	–	–
J1-46	Shield_GND	Single	–	J2-A	Frame GND
J1-45 Shield	Circuit_GND –	Twisted pair no. 12	–	J2-B	Circuit GND
			–	Shield	–

60 Pin	Signal Name	Type	Direction	34 Pin	Signal Name
J1-35 Shield	CTS/RTS —	Twisted pair no. 8	<— —	J2-C Shield	RTS —
J1-42 Shield	RTS/CTS —	Twisted pair no. 9	—> —	J2-D Shield	CTS —
J1-43 Shield	DTR/DSR —	Twisted pair no. 10	—> —	J2-E Shield	DSR —
J1-44 Shield	LL/DCD —	Twisted pair no. 11	—> —	J2-F Shield	RLSD —
J1-34 Shield	DSR/DTR —	Twisted pair no. 7	<— —	J2-H Shield	DTR —
J1-33 Shield	DCD/LL —	Twisted pair no. 6	<— —	J2-K Shield	LT —
J1-28 J1-27	RXD/TXD+ RXD/TXD—	Twisted pair no. 5	<— <—	J2-P J2-S	SD+ SD—
J1-18 J1-17	TXD/RXD+ TXD/RXD—	Twisted pair no. 1	—> —>	J2-R J2-T	RD+ RD—
J1-26 J1-25	RXC/TXCE+ RXC/TXCE—	Twisted pair no. 4	<— <—	J2-U J2-W	SCTE+ SCTE—
J1-22 J1-21	NIL/RXC+ NIL/RXC—	Twisted pair no. 3	—> —>	J2-V J2-X	SCR+ SCR—
J1-20 J1-19	TXCE/TXC+ TXCE/TXC—	Twisted pair no. 2	—> —>	J2-Y J2-AA	SCT+ SCT—

X.21 Dual Serial Module Cable Assembly

Figure B-7 shows the dual serial module X.21 cable assembly. Table B-14 lists the DTE pinouts; Table B-15 lists the DCE pinouts. Arrows indicate signal direction: —> indicates DTE to DCE, and <— indicates DCE to DTE.

Figure B-7 Dual Serial Module X.21 Cable Assembly

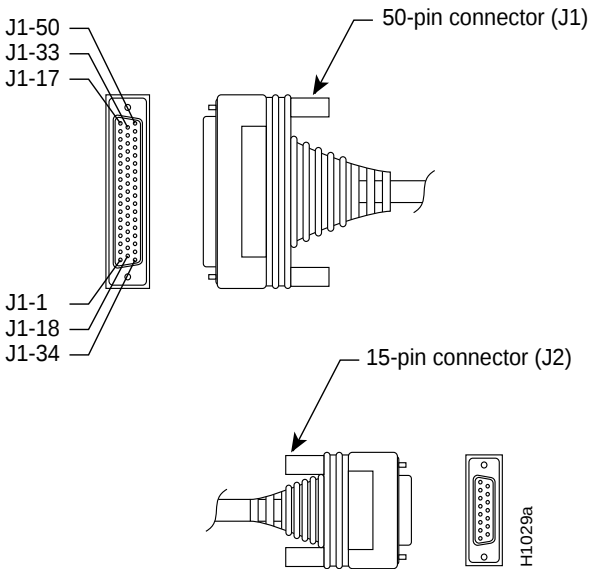


Table B-14 Dual Serial Module X.21 DTE Cable Pinouts

72-0683-02 DTE Connections				
From	Signal Name	Type	To	Signal Name
J1-5	MUX SEL		J1-38	GND
J1-36	449 GND		J2-8	X.21 GND
J1-41 J1-25	449 DTR	Jumper	J1-6 J1-22	449 CTS
J1-41 J1-25	449 DTR	Jumper	J1-8 J1-24	449 DSR
J1-43 J1-27	449 SCTE	Jumper	J1-37 J1-21	449 SCR

72-0683-02 DTE Connections

From	Signal Name	Type	To	Signal Name
J1-1 J1-34	449 TXD	Twisted pair	J2-2 J2-9	X.21 TXD
J1-4 J1-20	449 RTS	Twisted pair	J2-3 J2-10	X.21 CTL
J1-35 J1-19	449 RXD	Twisted pair	J2-4 J2-11	X.21 RXD
J1-10 J1-26	449 RLSD	Twisted pair	J2-5 J2-12	X.21 IND
J1-2 J1-18	449 SCT	Twisted pair	J2-6 J2-13	X.21 CLK

Table B-15 Dual Serial Module X.21 DCE Cable Pinouts**72-0737-01 DCE Connections**

From	Signal Name	Type	To	Signal Name
J1-5	MUX SEL		J1-38	GND
J1-36	449 GND		J2-8	X.21 GND
J1-41 J1-25	449 DSR	Jumper	J1-8 J1-24	449 DTR
J1-35 J1-19	449 TXD	Twisted pair	J2-2 J2-9	X.21 TXD
J1-6 J1-22	449-RTS	Twisted pair	J2-3 J2-10	X.21 CTL
J1-1 J1-34	449 RXD	Twisted pair	J2-4 J2-11	X.21 RXD

Serial Cable Pinouts

72-0737-01 DCE Connections

From	Signal Name	Type	To	Signal Name
J1-10 J1-26	449 RLSD	Twisted pair	J2-5 J2-12	X.21 IND
J1-43 J1-27	449 SCT		J2-6 J2-13	X.21 CLK
J1-17	DCE SEL		J1-44	
J1-15	Chassis GND		J2-1	

X.21 Four-Port Serial Module Cable Assembly

Figure B-8 shows the four-port serial X.21 cable assembly; Table B-16 lists the DTE pinouts; Table B-17 lists the DCE pinouts. Arrows indicate signal direction: —> indicates DTE to DCE, and <— indicates DCE to DTE.

Figure B-8 Four-Port Serial Module X.21 Cable Assembly

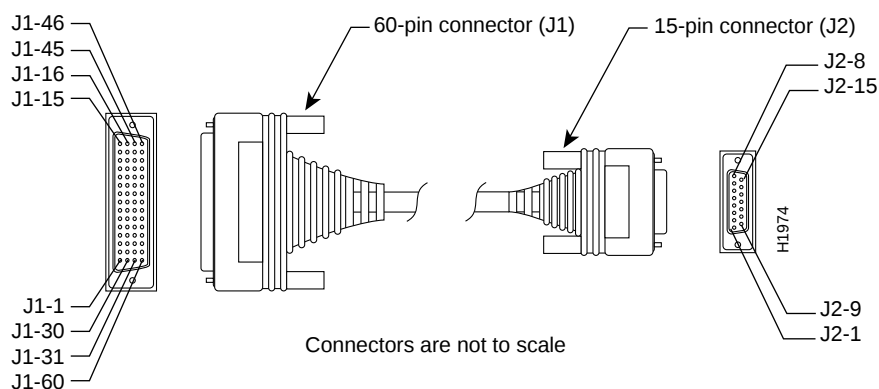


Table B-16 Four-Port Serial X.21 DTE Cable Pinouts (DB-60 to DB-15)

60 Pin	Signal Name	Type	Direction	15 Pin	Signal Name
J1-48 J1-47	GND MODE_2	Shorting group	-	-	-
J1-51 J1-52	GND MODE_DCE	Shorting group	-	-	-
J1-46	Shield_GND	Single	-	J2-1	Shield GND
J1-11 J1-12	TXD/RXD+ TXD/RXD-	Twisted pair no. 3	—> —>	J2-2 J2-9	Transmit+ Transmit-
J1-9 J1-10	RTS/CTS+ RTS/CTS-	Twisted pair no. 2	—> —>	J2-3 J2-10	Control+ Control-
J1-28 J1-27	RXD/TXD+ RXD/TXD-	Twisted pair no. 6	<— <—	J2-4 J2-11	Receive+ Receive-
J1-1 J1-2	CTS/RTS+ CTS/RTS-	Twisted pair no. 1	<— <—	J2-5 J2-12	Indication+ Indication-
J1-26 J1-25	RXC/TXCE+ RXC/TXCE-	Twisted pair no. 5	<— <—	J2-6 J2-13	Timing+ Timing-
J1-15 Shield	Control_GND -	Twisted pair no. 4	- -	J2-8 Shield	Control GND -

Table B-17 Four-Port Serial X.21 DCE Cable Pinouts (DB-60 to DB-15)

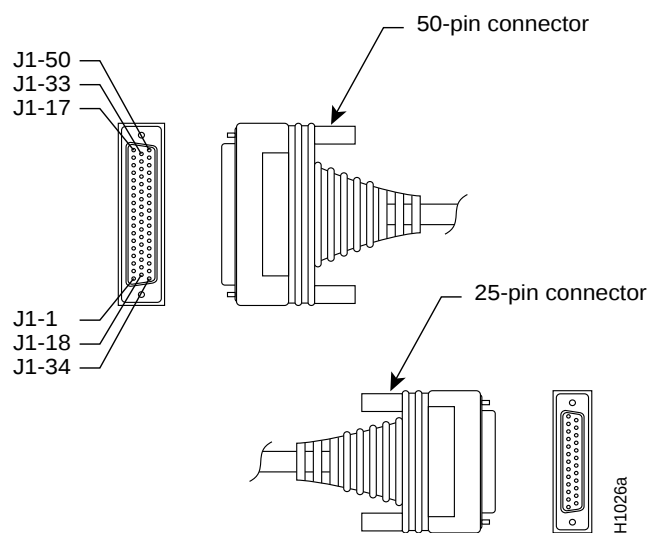
60 Pin	Signal Name	Type	Direction	15 Pin	Signal Name
J1-48 J1-47	GND MODE_2	Shorting group	-	-	-
J1-46	Shield_GND	Single	-	J2-1	Shield GND
J1-28 J1-27	RXD/TXD+ RXD/TXD-	Twisted pair no. 6	<— <—	J2-2 J2-9	Transmit+ Transmit-
J1-1 J1-2	CTS/RTS+ CTS/RTS-	Twisted pair no. 1	<— <—	J2-3 J2-10	Control+ Control-

Serial Cable Pinouts

60 Pin	Signal Name	Type	Direction	15 Pin	Signal Name
J1-11	TXD/RXD+	Twisted pair no. 3	—>	J2-4	Receive+
J1-12	TXD/RXD-		—>	J2-11	Receive-
J1-9	RTS/CTS+	Twisted pair no. 2	—>	J2-5	Indication+
J1-10	RTS/CTS-		—>	J2-12	Indication-
J1-24	TXC/RXC+	Twisted pair no. 4	—>	J2-6	Timing+
J1-23	TXC/RXC-		—>	J2-13	Timing-
J1-15	Control_GND	Twisted pair no. 5	-	J2-8	Control GND
Shield	-		-	Shield	-

EIA-530 Dual Serial Module Cable Assembly

Figure B-9 shows the dual serial module EIA-530 cable assembly and Table B-18 lists the EIA-530 DTE serial cable pinouts. Arrows indicate signal direction: —> indicates DTE to DCE, and <— indicates DCE to DTE.

Figure B-9 Dual Serial Module EIA-530 Cable Assembly**Table B-18 Dual Serial Module EIA-530 DTE Serial Cable Pinouts****72-0732-01 Connections**

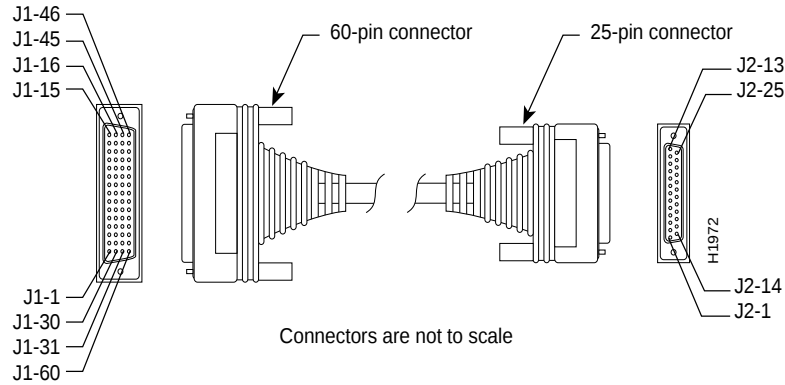
50 Pin	Signal Name	Direction	25 Pin	Type
J1-5 J1-38	Looped		NC	Jumper
J1-1 J1-34	TXD+ TXD-	—> —>	J2-2 J2-14	Twisted pair
J1-35 J1-19	RXD+ RXD-	<— <—	J2-3 J2-16	Twisted pair
J1-4 J1-20	RTS+ RTS-	—> —>	J2-4 J2-19	Twisted pair
J1-6 J1-22	CTS+ CTS-	<— <—	J2-5 J2-13	Twisted pair

Serial Cable Pinouts

72-0732-01 Connections				
50 Pin	Signal Name	Direction	25 Pin	Type
J1-10	RLSD+ (RR+)	<—	J2-8	Twisted pair
J1-26	RLSD– (RR–)	<—	J2-10	
J1-2	SCT+	<—	J2-15	Twisted pair
J1-18	SCT–	<—	J2-12	
J1-37	SCR+	<—	J2-17	Twisted pair
J1-21	SCR–	<—	J2-9	
J1-43	SCTE+ (TT+)	<—	J2-24	Twisted pair
J1-27	SCTE– (TT–)	<—	J2-11	
J1-7	LL	—>	J2-18	Twisted pair
J1-48	Ground		J2-23	Twisted pair
J1-36			J2-7	
J1-15	Shield		J2-1	Single wire
J1-8	DCE Ready	<—	J2-6	Twisted pair
J1-24	Ground		J2-23	
J1-41	DTE Ready	—>	J2-20	Twisted pair

EIA-530 Four-Port Serial Module Cable Assembly

Figure B-10 shows the four-port serial module EIA-530 cable assembly, and Table B-19 lists the pinouts. Arrows indicate signal direction: —> indicates DTE to DCE, and <— indicates DCE to DTE.

Figure B-10 Four-Port Serial Module EIA-530 Cable Assembly**Table B-19 Four-Port Serial EIA-530 DTE Cable Pinouts (DB-60 to DB-25)**

60 Pin	Signal Name	25 Pin	Signal Name	Direction	
				DTE	DCE ¹
J1-11	TXD/RXD+	J2-2	BA(A), TXD+	—>	
J1-12	TXD/RXD–	J2-14	BA(B), TXD–	—>	
J1-28	RXD/TXD+	J2-3	BB(A), RXD+	<—	
J1-27	RXD/TXD–	J2-16	BB(B), RXD–	<—	
J1-9	RTS/CTS+	J2-4	CA(A), RTS+	—>	
J1-10	RTS/CTS–	J2-19	CA(B), RTS–	—>	
J1-1	CTS/RTS+	J2-5	CB(A), CTS+	<—	
J1-2	CTS/RTS–	J2-13	CB(B), CTS–	<—	
J1-3	DSR/DTR+	J2-6	CC(A), DSR+	<—	
J1-4	DSR/DTR–	J2-22	CC(B), DSR–	<—	
J1-46	Shield_GND	J2-1	Shield	Shorted	
J1-47	MODE_2	—	—		
J1-48	GND	—	—	Shorted	
J1-49	MODE_1	—	—		

Serial Cable Pinouts

60 Pin	Signal Name	25 Pin	Signal Name	Direction	
				DTE	DCE ¹
J1-5	DCD/DCD+	J2-8	CF(A), DCD+	<—	
J1-6	DCD/DCD—	J2-10	CF(B), DCD—	<—	
J1-24	TXC/RXC+	J2-15	DB(A), TXC+	<—	
J1-23	TXC/RXC—	J2-12	DB(B), TXC—	<—	
J1-26	RXC/TXCE+	J2-17	DD(A), RXC+	<—	
J1-25	RXC/TXCE—	J2-9	DD(B), RXC—	<—	
J1-44	LL/DCD	J2-18	LL	—>	
J1-45	Circuit_GND	J2-7	Circuit_GND	—	
J1-7	DTR/DSR+	J2-20	CD(A), DTR+	—>	
J1-8	DTR/DSR—	J2-23	CD(B), DTR—	—>	
J1-13	TXCE/TXC+	J2-24	DA(A),	—>	
J1-14	TXCE/TXC—	J2-11	TXCE+	—>	
			DA(B),		
			TXCE—		
J1-51	GND	—	—	Shorted	
J1-52	MODE_DCE	—	—		

1. The EIA-530 interface cannot be operated in DCE mode. A DCE cable is not available for the EIA-530 interface.

E1-G.703/G.704 Cable Pinouts

Table B-20 shows the signal pinouts for each type of E1-G.703/G.704 interface cable. All cables use a DB-15 connector at the G.703/G.704 network processor module end.

Table B-20 E1-G.703/G.704 Adapter Cable Connector Pinouts

E1-G.703/G.704 Network Processor Module End		Network End				
DB-15 ¹		DB-15	Null Modem DB-15	BNC	Twinax	
Pin	Signal ²	Pin	Pin	Signal	Pin	Signal
9	TX Tip	1	3	TX Tip	Tip	Signal
2	TX Ring	9	11	TX Shield	Ring	Signal
10	TX Shield	2	4	—	Shield	Shield
8	RX Tip	3	1	RX Tip	Tip	Signal
15	RX Ring	11	9	RX Shield	Ring	Signal
7	RX Shield	4	2	—	Shield	Shield

1. Any pins not described in this table are not connected.

2. TX = transmit; RX = receive.

Ethernet Cable Pinouts

The following figures and tables provide the pinouts and signal descriptions for the Ethernet (AUI) cable and RJ-45 connector.

Ethernet (AUI) Cable Pinouts

Figure B-11 shows the Ethernet (AUI) cable assembly, and Table B-21 lists the pinouts.

Ethernet Cable Pinouts

Figure B-11 Ethernet (AUI) Cable Assembly

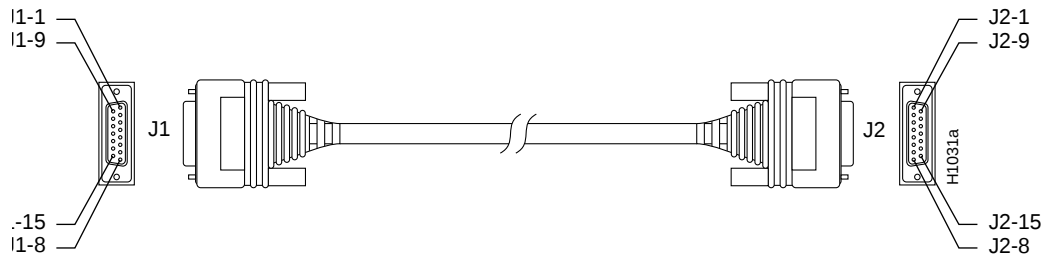


Table B-21 Ethernet (AUI) Pinouts

Pin ¹	Ethernet Circuit	Signal Name
3	DO-A	Data Out Circuit A
10	DO-B	Data Out Circuit B
11	DO-S	Data Out Circuit Shield
5	DI-A	Data In Circuit A
12	DI-B	Data In Circuit B
4	DI-S	Data In Circuit Shield
7	CO-A	Control Out Circuit A (not connected)
15	CO-B	Control Out Circuit B (not connected)
8	CO-S	Control Out Circuit Shield (not connected)
2	CI-A	Control In Circuit A
9	CI-B	Control In Circuit B
1	CI-S	Control In Circuit Shield
6	VC	Voltage Common
13	VP	Voltage Plus
14	VS	Voltage Shield (L25 and M25)
Shel l	PG	Protective Ground

1. Any pin not referenced on a connector is not connected.

RJ-45 10BaseT Connector Pinouts

Figure B-12 shows the RJ-45 10BaseT connector, and Table B-22 lists the pinouts.

Figure B-12 RJ-45 10BaseT Connector

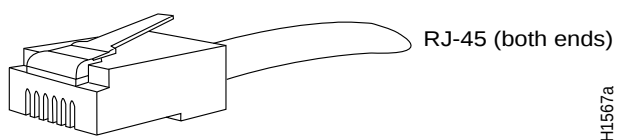


Table B-22 RJ-45 Connector Pinout

Pin ¹	Description
1	TX+
2	TX-
3	RX+
4	—
5	—
6	RX-
7	—
8	—

1. Any pin not shown is not connected.

Token Ring Port Pinouts

Table B-23 shows the original single-port Token Ring network processor module (Cisco product number NP-1R) port pinouts.

Table B-23 Token Ring Port Pinouts (DB-9 Connector)

9-Pin	Signal Name
1	RX–
2	NC ¹
3	NC
4	NC
5	TX–
6	RX+
7	NC
8	NC
9	TX+

1. NC = not connected.

Table B-24 shows the dual-port and newer single-port (Cisco product numbers NP-2R and NP-1RV2) Token Ring network processor module port pinouts:

Table B-24 Dual-Port Token Ring Pinouts (DB-9 Connector)

9-Pin	Signal Name
1	RX–
2	Ground
3	+5 Volt, fused
4	Ground

9-Pin	Signal Name
5	TX–
6	+RX
7	Ground
8	Ground
9	+TX

BRI Pinouts

The BRI interface port pinouts are shown in Table B-25.

Table B-25 **BRI Port Pinouts (RJ-45)**

8 Pin ¹	TE ²	NT ³	Polarity
3	Transmit	Receive	+
4	Receive	Transmit	+
5	Receive	Transmit	–
6	Transmit	Receive	–

1. Pins 1, 2, 7, and 8 are not used.
2. TE refers to terminal terminating layer 1 aspects of TE1, TA, and NT2 functional groups.
3. NT refers to network terminating layer 1 aspects of NT1 and NT2 functional groups.



Caution To prevent damage to the system, make certain you connect the BRI cable to the BRI connector *only* and not to any other RJ-45 connector.

Channelized T1 Pinouts

For the CT1, two standard T1 serial cables are available from Cisco Systems: null-modem and straight-through. A straight-through cable connects your router to an external CSU. Null-modem cables are used for back-to-back operation and testing.

The cables have male 15-pin DB connectors at each end to connect the CT1with the external CSU.

The T1 interface cable has two 15-pin DB connectors at each end to connect the CT1with the external T1 CSU. Figure B-13 shows the T1 interface cable, connectors and pinouts.

The T1 interface cables have two, male, 15-pin DB connectors (one at each end) to connect the CT1 with the external CSU. Table B-26 lists the pinouts for the null-modem T1 cable and Table B-27 lists the pinouts for the straight-through T1 cable.

Figure B-13 T1 Interface Cable

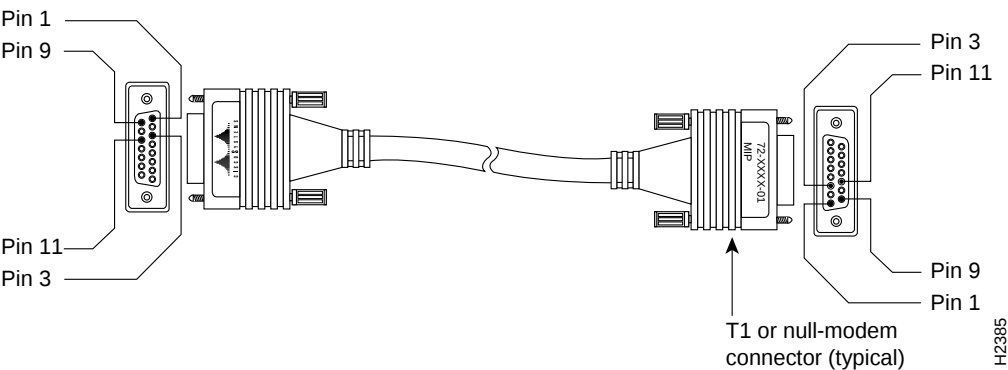


Table B-26 T1 Null-Modem Cable Pinouts

15-Pin DB Connector			15-Pin DB Connector
Signal	Pin	Pin	Signal
Transmit Tip	1	3	Receive Tip
Receive Tip	3	1	Transmit Tip

15-Pin DB Connector		15-Pin DB Connector	
Signal	Pin	Pin	Signal
Transmit Ring	9	11	Receive Ring
Receive Ring	11	9	Transmit Ring

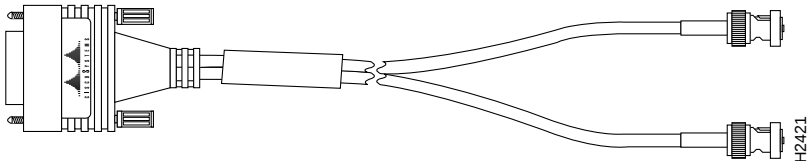
Table B-27 T1 Straight-Through Cable Pinouts

15-Pin DB Connector		15-Pin DB Connector	
Signal	Pin	Pin	Signal
Transmit Tip	1	1	Transmit Tip
Transmit Ring	9	9	Transmit Ring
Receive Tip	3	3	Receive Tip
Receive Ring	11	11	Receive Ring

Channelized E1 Pinouts

For the CE1 module, four serial cables are available from Cisco Systems. All three have DB-15 connectors on the CE1 end and either BNC, DB-15, twinax, or RJ-45 connectors on the network end. Figure B-14, Figure B-15, Figure B-16, and Figure B-17 show the E1 interface cables.

Figure B-14 E1 Interface Cable for 75-Ohm, Unbalanced Connections (with BNC Connectors)



Channelized E1 Pinouts

Figure B-15 E1 Interface Cable for 120-Ohm, Balanced Connections (with DB-15 Connector)

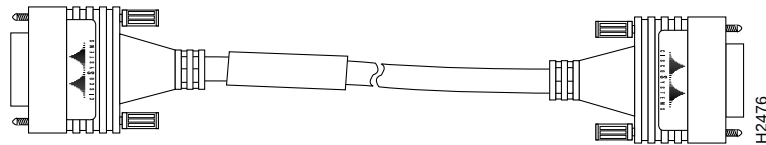


Figure B-16 E1 Interface Cable for 120-Ohm, Balanced Connections (with Twinax Connectors)

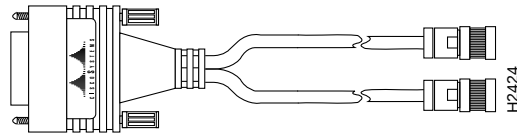
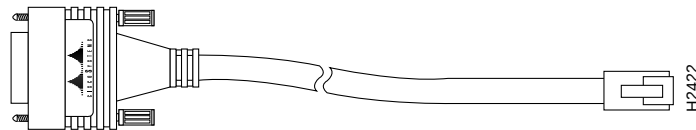


Figure B-17 E1 Interface Cable for 120-Ohm, Balanced Connections (with RJ-45 Connector)



The E1 interface cables have two, male, 15-pin DB connectors (one at each end) to connect the CE1 with the external CSU. Table B-28 lists the pinouts for the E1 interface cables available from Cisco Systems.

Table B-28 E1 Interface Cable Pinouts

CE1 End		Network End						
DB-15¹		BNC	DB-15		Twinax		RJ-45	
Pin	Signal²	Signal	Pin	Signal	Pin	Signal	Pin	Signal
9	TX Tip	TX Tip	1	TX Tip	TX-1	TX Tip	1	TX Tip
2	TX Ring	TX Shield	9	TX Ring	TX-2	TX Ring	2	TX Ring
10	TX Shield	–	2	TX Shield	Shield	TX Shield	3	TX Shield
8	RX Tip	RX Tip	3	RX Tip	RX-1	RX Tip	4	RX Tip
15	RX Ring	RX Shield	11	RX Ring	RX-2	RX Ring	5	RX Ring
7	RX Shield	–	4	RX Shield	Shield	RX Shield	6	RX Shield

1. Any pins not described in this table are not connected.

2. TX = transmit. RX = receive.