APPENDIX B

Cable Specifications

If you prefer to build your own cables, this appendix provides cable specifications for the Cisco ASR 901 router.

This appendix includes the following sections:

Warning   **To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, use only shielded cables that are grounded on both ends for Type 2 and Type 4 ports that require shielded cables.**

Gigabit Ethernet Connector Pinouts

This section illustrates the Gigabit Ethernet RJ-45 connector and lists its pinout and signal descriptions. Note that the RJ-45 ports are capable of operating in both 100BaseT and 1000BaseT modes.

Figure B-1 shows the RJ-45 connector and port, and Table B-1 lists the connector pinouts and signals.
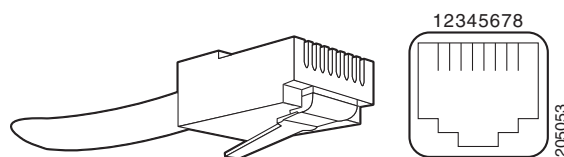
Figure B-1   RJ-45 Connector and Port

Table B-1   RJ-45 Connector Pinouts

Pin	FE Signal	GE Signal
1	TX data+	TX A+
2	TX data–	TX A–
3	RX data+	RX B+
4	Not used	TX C+
5	Not used	TX C–
6	RX data–	RX B–
7	Not used	RX D+
8	Not used	RX D–

SFP Port Pinouts and Cable Specifications

For information about SFP modules supported by the Cisco ASR 901 router, including pinouts, see the Cisco Interfaces and Modules support section on Cisco.com.

Note   Pins not listed in the tables in this appendix are not connected

T1/E1 Port Pinouts

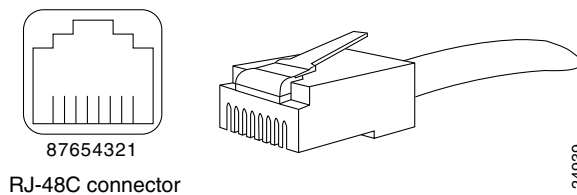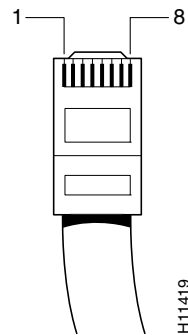Figure B-2 shows the RJ-48C connector used by the T1/E1 ports on the TDM interface module on the Cisco ASR 901 router.

Figure B-2   RJ-48C Connector

87654321

RJ-48C connector

24939

Figure B-3 shows the RJ-48C connector wiring for the T1/E1 cable.

Figure B-3   RJ-48-to-RJ-48 T1/E1 Cable Wiring

Note   We recommend using a shielded cable for RJ-48C connectors.

Table B-2 shows the pinout configuration for the RJ-48C connectors on the Cisco ASR 901 router for both the shielded and unsaddled cables for either T1 or E1. Table B-2 shows the pinout configuration for the RJ-45 connectors on the TDM interface module on the Cisco ASR 901 router.

Table B-2   T1/E1 Port Pinout for the Cisco ASR 901 router

Pin	Signal Name	Direction	Description
1	RX Tip	Input	Receive Tip
2	RX Ring	Input	Receive Ring
3			Not used
4	TX Tip	Output	Transmit Tip
5	TX Ring	Output	Transmit Ring
6			Not used
7			Not used
8			Not used

Console Port Signals and Pinouts

The Cisco ASR 901 router ships with a console cable kit, which contains the cable and adapters to connect a console terminal (an ASCII terminal or PC running terminal emulation software). The console cable kit includes the following items:

- RJ-45-to-RJ-45 rollover cable
- RJ-45-to-DB-9 female DTE adapter (labeled TERMINAL)
- RJ-45-to-DB-25 female DTE adapter (labeled TERMINAL)

To connect a modem, you need to order an auxiliary cable.

For console connections, see the "Console Port Signals and Pinouts" section on page B-4.

Console Port Signals and Pinouts

Use the thin, flat, RJ-45-to-RJ-45 rollover cable and the RJ-45-to-DB-9 female DTE adapter (labeled TERMINAL) to connect the console port to a PC running terminal emulation software. Figure B-4 shows how to connect the console port to a PC. Table B-4 lists the pinouts for the asynchronous serial console port, the RJ-45-to-RJ-45 rollover cable, and the RJ-45-to-DB-9 female DTE adapter (labeled TERMINAL).
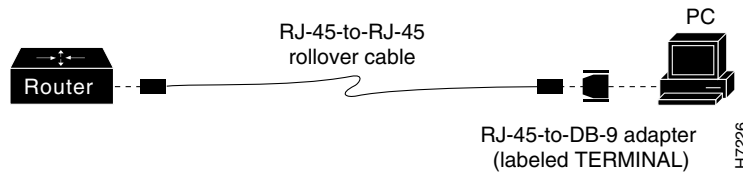
Figure B-4   *Connecting the Console Port to a PC*

Table B-3 lists the Console port pinouts for the Cisco ASR 901 router.

Table B-3   *Console Port Pinouts*

Pin	Signal Name	HP Pins	Direction	Description
1	RTS	UART_RTS1	Output	Request to send
2	DTR	NC		
3	TXD	UART_SOUT1	Output	Transmit data
4	RI	GND		Ring indicator
5	GND	GND		
6	RXD	UART_SIN1	Input	Receive data
7	DSR/DCD	NC	Input	Data set ready/Data Carrier detect
8	CTS	UART_CTS1	Input	Clear to send

Table B-4 describes the pinouts RJ-45-to-RJ-45 and RJ-45-to-DB-9 rollover cables.

Table B-4   *Console Port Signaling and Cabling Using a DB-9 Adapter*

Console Port (DTE)	RJ-45-to-RJ-45 Rollover Cable		RJ-45-to-DB-9 Terminal Adapter (Connected to Rollover Cable)	Console Device
Signal	RJ-45 Pin	RJ-45 Pin	DB-9 Pin	Signal
RTS	1[1]	8	8	CTS
DTR	2	7	6	DSR/DCD
TxD	3	6	2	RxD
GND/RI	4	5	5	GND
GND	5	4	5	GND/RI
RxD	6	3	3	TxD

Table B-4   Console Port Signaling and Cabling Using a DB-9 Adapter

Console Port (DTE)	RJ-45-to-RJ-45 Rollover Cable		RJ-45-to-DB-9 Terminal Adapter (Connected to Rollover Cable)	Console Device
Signal	RJ-45 Pin	RJ-45 Pin	DB-9 Pin	Signal
DSR/DCD	7	2	4	DTR
CTS	8[1]	1	7	RTS

1. Pin 1 is connected internally to pin 8.

Table B-5 lists the pinouts for the asynchronous serial console port, the RJ-45-to-RJ-45 rollover cable, and the RJ-45-to-DB-25 female DTE adapter (labeled TERMINAL).

Table B-5   Console Port Signaling and Cabling Using a DB-25 Adapter

Console Port (DTE)	RJ-45-to-RJ-45 Rollover Cable		RJ-45-to-DB-25 Terminal Adapter	Console Device
Signal	RJ-45 Pin	RJ-45 Pin	DB-25 Pin	Signal
RTS	1[1]	8	5	CTS
DTR	2	7	6	DSR/DCD
TxD	3	6	3	RxD
GND/RI	4	5	7	GND
GND	5	4	7	GND/RI
RxD	6	3	2	TxD
DSR/DCD	7	2	20	DTR
CTS	8[2]	1	4	RTS

1. Pin 1 is connected internally to pin 8.

Identifying a Rollover Cable

To identify a rollover cable, compare the modular plugs at the two ends of the cable. When you hold the plugs side by side, with the tab at the back, the wire connected to the pin on the outside of the left plug should be the same color as the wire connected to the pin on the outside of the right plug (Figure B-5.) If you purchased your cable from Cisco Systems, pin 1 is white on one connector, and pin 8 is white on the other (a rollover cable connects pins 1 and 8, 2 and 7, 3 and 6, and 4 and 5).

Figure B-5   Identifying a Rollover Cable
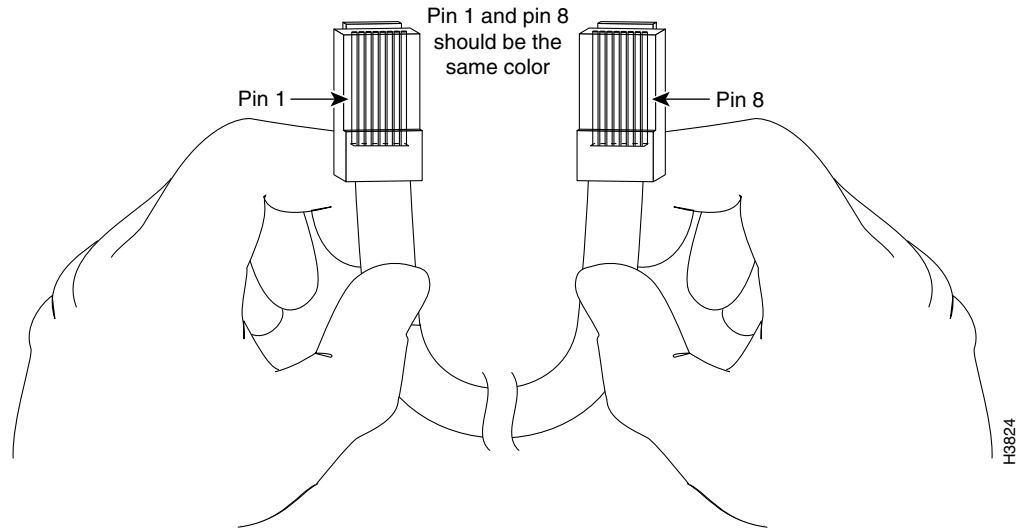
BITS Port Pinouts

Table B-6 list the pinouts for the BITS interface RJ-45 port on the Cisco ASR 901 router.

Table B-6   BITS Pinouts for the Cisco ASR 901 router

Pin	Signal Name	Direction	Description
1	RX ring	Input	Receive ring
2	RX tip	Input	Receive tip (T1/E1)
3	Not connected		
4	TX ring	Output	Transmit ring
5	TX tip	Output/input	Transmit tip (T1/E1)
6			Not connected
7			Not connected
8			Not connected

Time of Day Pinouts

Table B-6 list the pinouts for the Time of Day RJ-45 interface on the Cisco ASR 901 router.

Table B-7   Time of Day RJ45 Interface Pinout

Pin	Signal Name	Direction	Description
1			Not connected
2			Not connected

Table B-7   Time of Day RJ45 Interface Pinout

Pin	Signal Name	Direction	Description
3			Not connected
4	Ground		
5	Ground		
6			Not connected
7	TOD_N	Output/Input	Time of Day RS422 differential input or output
8	TOD_P	Output/Input	Time of Day RS422 differential input or output

GPS Port Pinouts

The Cisco ASR 901 router has a 10Mhz and a 1PPS GPS port that allow you to configure input or output clocking with a GPS device. Table B-8 summarizes the pinouts for the 10Mhz and 1PPS interfaces.

Note   For pinouts related to ToD and 1PPS using the BITS interface, see Console Port Signals and Pinouts.

Table B-8   GPS Port Pinouts for the Cisco ASR 901 router

	10 Mhz	1PPS
Waveform	Input—Sine wave Output—Square wave	Input—Pulse shape Output—Pulse shape
Amplitude	Input— > 1.7 volt p-p (+8 to +10 dBm) Output— > 2.4 volts TTL compatible	Input— > 2.4 volts TTL compatible Output— > 2.4 volts TTL compatible
Impedance	50 ohms	50 ohms
Pulse Width	50% duty cycle	26 microseconds
Rise Time	Input—AC coupled Output—5 nanoseconds	40 nanoseconds

The 1PPS interface type is Series 1.0 / 2.3, 200 ohms.

For instructions on how to configure the 10 Mhz and 1PPSs ports, see the *Cisco ASR 901 router Mobile Wireless Software Configuration Guide*.

Alarm Port Pinouts

The router has four alarm inputs. The alarm setting is open or closed.

- Open means that the normal condition has current flowing through the contact (referred to as *normally closed* contact). The alarm is generated when the current stops.

- Closed means that no current flows through the contact (referred to as *normally open* contact). The alarm is generated when the current flows.

The alarm input is a dry-contact alarm port. You can connect up to four alarm inputs from devices, such as a door, a temperature gauge, or a fire alarm, to the alarm port. You can use the CLI to set the alarm severity to minor, major, or critical. An alarm generates a system message.

Note External DC bias is not required for the alarm port inputs.

Figure B-6 shows the RJ-45 connector pinouts used for alarm, and Table B-9 lists the connector pinouts and signals.

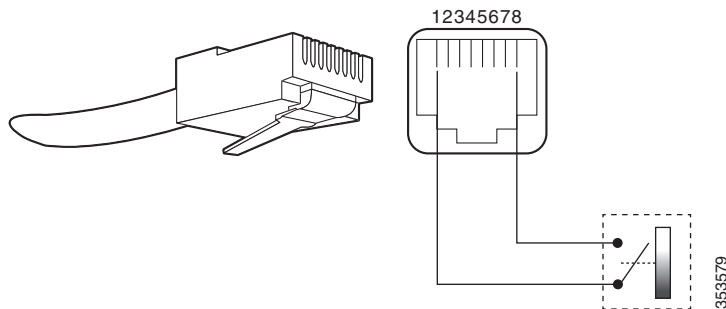*Figure B-6* **RJ-45 Connector Pinouts for Alarm**

Table B-9 list the pinouts for the alarm port (RJ45) on the Cisco ASR 901 router.

Table B-9 **Alarm port Pinout**

Pin	Signal Name	Description
1	Alarm input 1	
2	Alarm input 2	
3		Not connected
4	Alarm input 3	
5	Alarm input 4	
6		Not connected
7		Not connected
8	Alarm input return	

Management Ethernet Port Pinouts

Table B-10 list the pinouts for the management ethernet port (RJ45) on the Cisco ASR 901 router.

Table B-10   Management Ethernet Pinout

Pin	Signal Name	Description
1	RxD_P	
2	RxD_N	
3	TxD_P	
4		Not connected
5		Not connected
6	TxD_N	
7		Not connected
8		Not connected

Auxiliary Port

Auxiliary port is not supported on the Cisco ASR 901 router and you should not try to configure the auxiliary port.

Auxiliary Port