Cable and Pin Information

This appendix provides information on cables that can be used with the Catalyst 3920 Token Ring Switch. It also provides minimum pinout information so that you can verify that the cables you are using are wired correctly.

This appendix contains the following information:

- Connecting to the Management (EIA 232) Port on page F-1
- Twisted-Pair Cable Pinouts on page F-2
- EIA 232 Port and Cable Pinouts on page F-2
- Cabling Recommendations on page F-4
- Cabling Length Recommendations for Dedicated-Media LAN Segments on page F-4
- Lobe Wiring Rules for Dedicated-Media LAN Segments on page F-5
- Cable Length and Lobe Wiring Rules for Shared-Media LAN Segments on page F-6
- Number of Attaching Devices on page F-6

Connecting to the Management (EIA 232) Port

Table F-1 lists the type of cables that are used when connecting to the EIA 232 port on the Catalyst 3920.

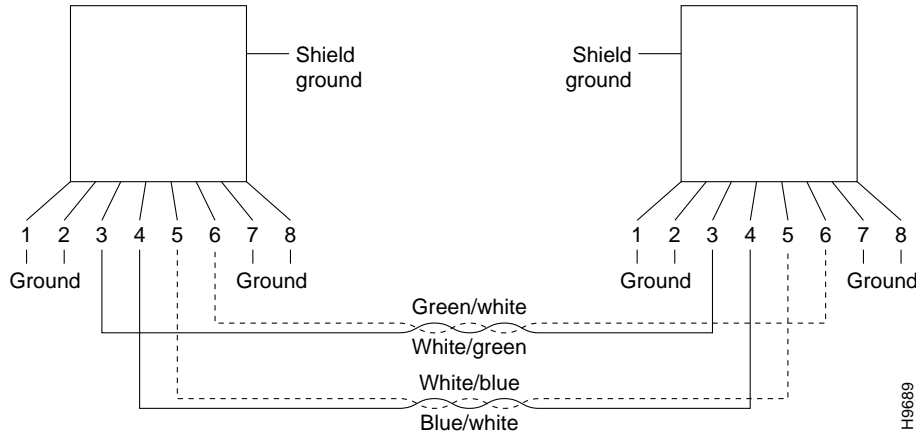**Table F-1   Connecting the Catalyst 3920 to the EIA 232 Port**

Cable Function	Cable Type or Cable Solution
Connect a modem to the EIA 232 port.	Connect one end of a straight-through, EIA 232 modem cable to the EIA 232 port and the other to the modem.
Connect a PC or other DTE device to the EIA 232 port.	Connect one end of a crossover EIA 232 cable to the EIA 232 port and the other end to the PC or DTE device. Attach a null-modem adapter to the EIA 232 port, then attach a straight-through modem cable to the null-modem adapter.

Twisted-Pair Cable Pinouts

When connecting devices to the Token Ring ports on the Catalyst 3920, you must use a straight-through cable (Figure F-1).

The Catalyst 3920 RJ-45 connector makes ground available on the shield and on pins 1, 2, 7, and 8. Shielded cables will provide continuity for ground to any shielded connector on the other end of the cable.

Figure F-1　　Straight-Through Cable

EIA 232 Port and Cable Pinouts

The Catalyst 3920 has an EIA 232 port wired as a DTE. For this reason, you cannot use a straight-through modem cable to directly connect a terminal to the EIA 232 port.

For a terminal connection, you can use either a null-modem cable or a modem cable with a null-modem adapter attached. For a modem connection, you can use a standard modem cable.

This section provides pinout information for the cables you can use to connect to the EIA 232 port.

EIA 232 Modem Cable Connections

Use a straight-through modem cable to connect the EIA 232 port of the Catalyst 3920 to a modem (Figure F-2).

Figure F-2　　EIA 232 Modem Cable

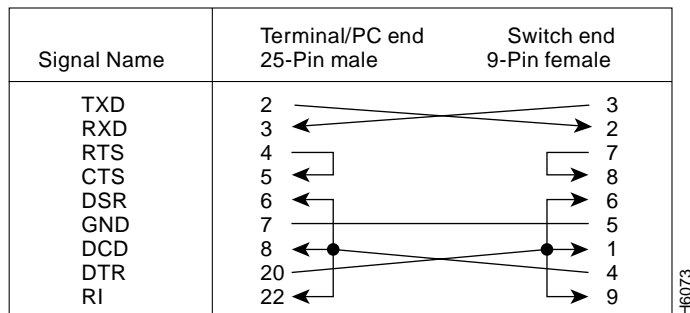| Signal name	Terminal/PC end 25-pin male	Switch end 9-pin female
TXD	2 ←	3
RXD	3 →	2
RTS	4 ←	7
CTS	5 →	8
DSR	6 →	6
GND	7 →	5
DCD	8 →	1
DTR	20 ← →	4
RI	22 →	9

EIA 232 Null-Modem Connections

Use a null-modem (crossover) cable (Figure F-3) to connect the EIA 232 port to a terminal (DTE) with a 25-pin connector. Alternatively, you can use a modem cable and a null-modem adapter. Data Terminal Ready (DTR), pin 20, and Ready to Send (RTS), pin 4, must be on, or high, on your terminal or in your terminal emulation program.

Figure F-3   **EIA 232 Null-Modem Cable for Terminal with 25-Pin Connector**

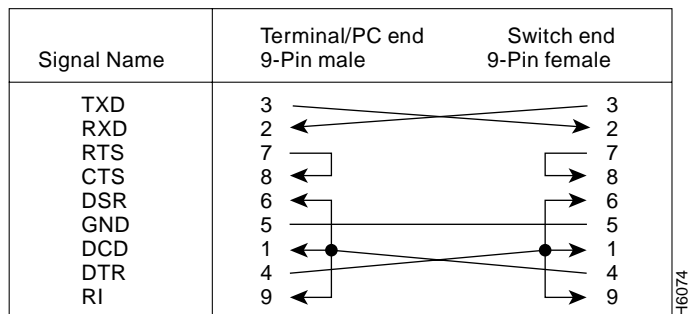| Signal Name	Terminal/PC end 25-Pin male	Switch end 9-Pin female
TXD	2	3
RXD	3	2
RTS	4	7
CTS	5	8
DSR	6	6
GND	7	5
DCD	8	1
DTR	20	4
RI	22	9

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Use a null-modem (crossover) cable (Figure F-4) to connect the EIA 232 port to a terminal (DTE) with a 9-pin connector. Alternatively, you can use a modem cable and a null-modem adapter. DTR (pin 4) and RTS (pin 7) must be on, or high, on your terminal or in your terminal emulation program.

Figure F-4   **EIA 232 Null-Modem Cable for Terminal with 9-Pin Connector**

Signal Name	Terminal/PC end 9-Pin male	Switch end 9-Pin female
TXD	3	3
RXD	2	2
RTS	7	7
CTS	8	8
DSR	6	6
GND	5	5
DCD	1	1
DTR	4	4
RI	9	9

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Cabling Recommendations

Table F-1 contains the maximum supported lobe lengths. The maximum lengths reflect the longest lengths supported by the transmission characteristics of IEEE 802.5-compliant adapters. The recommended distances for the various cable types are set by North American and international commercial building wiring standards. It is good practice to follow the cabling standards guidelines when installing building cabling to help ensure a longer useful life for your cabling infrastructure, migration to new technologies, and maximum flexibility for the network configuration.

Table F-2   Copper Cable Types

Cable Type	Impedance
Type 1 and 1A	150 ohm
Type 2 and 2A	150 ohm
Type 8	150 ohm
Type 9	150 ohm
Type 3	100 ohm
Category 3	100 and 120 ohm
Category 4	100 and 120 ohm
Category 5	100 and 120 ohm

If you are installing new cabling for data applications, it is recommended that you use the following types of cable:

- For lobe cabling from the telecommunications closet to the wall outlet, use 150-ohm STP or four-pair Category 5 cable that meets the international cable standard (ISO/IEC 11801) or North American cabling standard (EIA/TIA 568A).

- For backbone cabling, use 62.5/125-micron multimode optical fiber cable that meets the international cable standard (ISO/IEC 11801) or the North American cabling standard (EIA/TIA 568A).

Cabling Length Recommendations for Dedicated-Media LAN Segments

The IBM Token Ring Network dedicated-media connections support only one attached entity (workstation or Catalyst 3920) per connection. In a Token Ring network, the section of cable that attaches a device to an access unit is called a lobe.

For all supported cable types except optical fiber, the recommended maximum cable lobe length is 625 feet (190 m) plus a 33 foot (10 m) total allowance for the patch cords in the office and the telecommunications closets.

Lobe Wiring Rules for Dedicated-Media LAN Segments

Table F-3, Table F-4, Table F-5, and Table F-6 specify the maximum supported lobe lengths for the following types of cables.

- 150-ohm, shielded media lobe lengths cable

- Lobe lengths for 100- or 120-ohm shielded or unshielded cable

An additional 33 feet (10 m) per lobe length is allowed to accommodate patch cables, unless otherwise specified.

Table F-3   Lobe Lengths for 150-Ohm Shielded Media

Ring Speed	Types 1 and 1a, Types 2 and 2a	Type 8	Type 9
4 Mbps	2460 feet (750 m)	1234 feet (376 m)	1640 feet (500 m)
16 Mbps	952 feet (290 m)	480 feet (146 m)	656 feet (200 m)

Note   Subtract 33 feet (10 m) from the allowed Type 1 or 2 distance each time a 8 feet (2.4 m) patch cable is replaced by a Type 6, 30 foot (9 m) patch cable on that lobe.

Table F-4   Lobe Lengths for 100-Ohm Shielded or Unshielded Cable

Ring Speed	100-Ohm Type 3	100-Ohm Category 3
4 Mbps	328 feet (100 m)	820 feet (250 m)
16 Mbps	Not supported	328 feet (100 m)

Table F-5   Lobe Lengths for 100- and 120-Ohm Shielded or Unshielded Cable

Ring Speed	100- or 120-Ohm Category 4	100- or 120-Ohm Category 5
4 Mbps	1148 feet (350 m)	1148 feet (350 m)
16 Mbps	656 feet (200 m)	656 feet (200 m)

Table F-6   Lobe Lengths for 100- and 120-Ohm Shielded or Unshielded Cable

Ring Speed	100-Ohm Type 3	100-Ohm Category 3	100- OR 120-Ohm Category 4	100- or 120-Ohm Category 5
4 Mbps	328 feet (100 m)	820 feet (250 m)	1148 feet (350 m)	1148 feet (350 m)
16 Mbps	Not supported	328 feet (100 m)	656 feet (200 m)	656 feet (200 m)

Cable Length and Lobe Wiring Rules for Shared-Media LAN Segments

The types of cables that can be used are the same as those described for dedicated-media segments. The acceptable distances are defined by the hub or concentrator attached to the Catalyst 3920 port.

Number of Attaching Devices

A Token Ring network supports up to 260 attaching devices or nodes on a single network when using 150-ohm shielded media (type 1, 1A, 2, or 2A). When cable segments in the network are 100 or 120 ohm, this number is decreased to 132 (72 if using any 4-Mbps-only adapters or filters).