
Chapter 3. Filling Out the Planning Documents

Now that you have determined the number of attaching devices, their locations, and the wiring closets involved, you are ready to begin preparing the planning documents for your network. These documents will be used during the installation of the system and for problem determination throughout the life of the installation. Consequently, the charts must be carefully prepared and kept up-to-date at all times.

If you wish to automate the record-keeping for your network, see Appendix C for a listing of a sample program for the IBM Personal Computer (or an IBM PC-compatible computer) that can help you fill out the 8230, 8228, 8218, 8219, and 8220 Cabling Charts, the Ring Sequence Chart, and the Locator Charts.

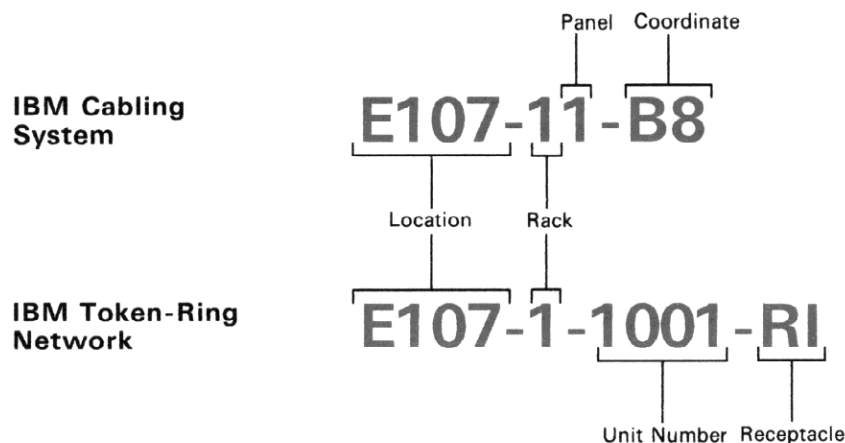
Before filling out the planning charts, you should understand the recommended numbering and labeling scheme for the network. An explanation of that scheme follows this section.

To proceed with filling out the planning documents, you must have completed the planning of your IBM Cabling System according to the instructions in the *IBM Cabling System Planning and Installation Guide*. You will need completed Cable Schedules and Rack Inventory Charts that contain information about your IBM Cabling System plans.

Numbering and Labeling Your IBM Token-Ring Network

The numbering scheme for the IBM Token-Ring Network as illustrated below is a logical extension of the system recommended in the *IBM Cabling System Planning and Installation Guide*. If you have followed the recommendations for the IBM Cabling System, no changes to the labeling of your permanently installed wiring should be necessary.

You must assign each 8218, 8219, 8220, 8228, and 8230 a unique, 4-digit unit number, so that individual units may be identified while repairing or restructuring your network. These 4-digit numbers are part of a sequence of numbers that follows the pattern set forth in the *IBM Cabling System Planning and Installation Guide*.



The first group of characters represents the work area or wiring closet number where the component is located.

The second, single-character group indicates the number of the rack within the wiring closet; a "0" indicates that the device is not rack-mounted.

The third group is four characters long and is the unique unit number assigned to the components by your establishment.

The fourth group of characters indicates the receptacle on the component. For example, "RI" in the fourth group of characters indicates the RI receptacle on component 1001.

Plan to place all 8228s that are rack mounted below the second distribution panel in a rack and above any coaxial patch panels that may be in the rack. The *IBM Cabling System Planning and Installation Guide* suggests that no more than 48 of the connectors on each of the 2 distribution panels be wired to work areas (a total of 96 connectors). Therefore, you should plan for no more than 12 IBM 8228s within a single rack. A rack with 2 distribution panels installed can hold 2 IBM 8230 base units and up to 6 LAMs. To determine the maximum capacity for a rack containing both 8228s and 8230s, use the template found in the binder pocket and a copy of the rack inventory chart. If you expect that your network will grow in the future, you may want to leave space in the rack for 8228s to be installed at a later date.

IBM 8218s, 8219s, and 8220s that are installed in a rack should be placed in a rack-mounting assembly that has been mounted at the bottom of the rack, just above any coaxial patch panels that may be present. Leave at least 63 mm (2.5 in.) of clearance between the floor and the bottom of the rack-mounting bracket.

The numbering system does not indicate the position of the component in the rack. IBM 8230s should be installed from the top down; each base unit should have its associated LAMs installed directly beneath it. You should install 8228s from the top down in the rack. For further information about installation and cabling procedures, see the *IBM Token-Ring Network Installation Guide*.

Numbering Attaching Devices

Assign a unique number to all attaching devices to assist in problem determination procedures.

Figure 3-1 illustrates the numbering and labeling scheme for the network components. Sheets of adhesive labels may be ordered through the *IBM Cabling System Catalog*.

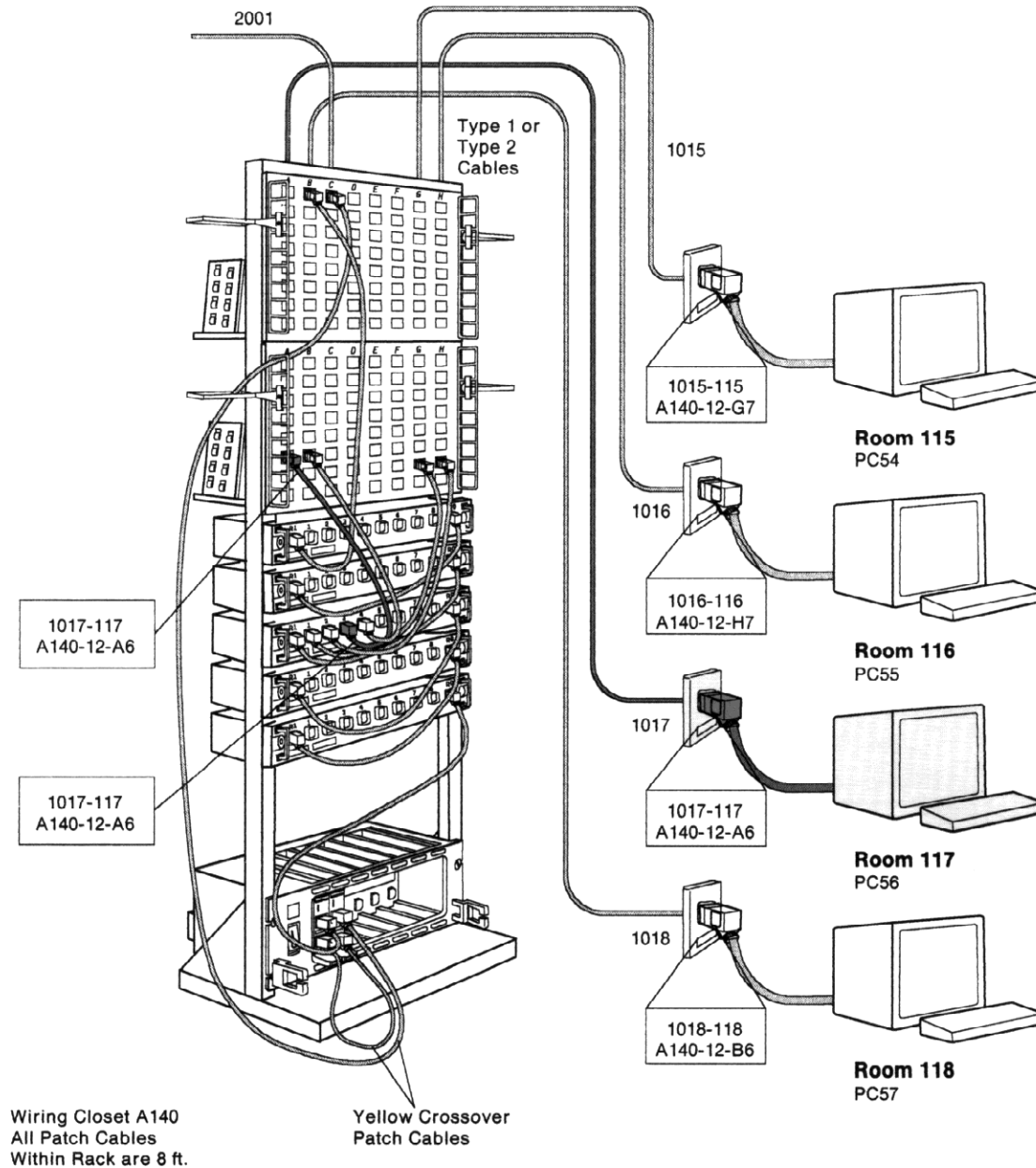


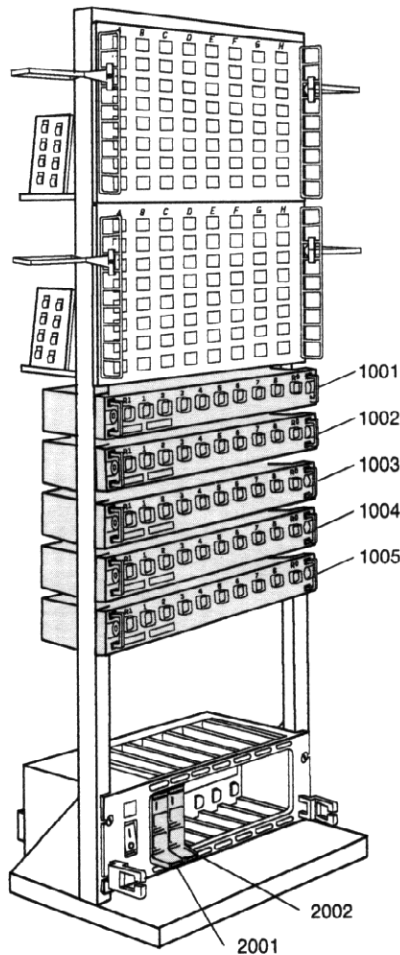
Figure 3-1. Labeling an IBM Token-Ring Network

The Rack Inventory Chart

The Rack Inventory Chart allows you to keep track of all components installed in each rack in your establishment to facilitate planning and installation.

Find the Rack Inventory Chart for each of the racks where you will be installing components. Mark the location of each component (including rack-mounting brackets) on the Rack Inventory Charts using the scaled template provided in the back of this manual. If your rack must have two rack-mounting brackets, they must have 152 mm (6 in.) of unobstructed clearance between them. Use the template for the 8218/8219/8220 to mark off this clearance. Write the unit number and device type (for example, MSAU for an IBM 8228 Multistation Access Unit) of each component on the Rack Inventory Chart.

Note: The scaled template provides for placing IBM 7532 Industrial Computer components in a rack. These components should not be placed in the same rack with IBM Cabling System components.



Rack Inventory Chart

11	
12	
1001 (MSAU)	
1002 (MSAU)	
1003 (MSAU)	
1004 (MSAU)	
1005 (MSAU)	
2 2	
0 0	
0 0	
1 2	
8218 8218	

Wiring closet number 106

Rack number L

Date 8/1/90

Planner's initials AB

Instructions

Fill out a Rack Inventory Chart for each equipment rack.

1. Enter the wiring closet location number, the equipment rack identification number, and the planner's initials.
2. Using the template for the Rack Inventory Chart that came with this manual, draw an outline of each component that will be installed in the rack.
3. The slots at the bottom of the distribution panel template are used only for the lowermost distribution panel in a rack. The slots indicate that there are 38.1 mm (1-1/2 in.) between that panel and the next unit in the rack.
4. Write the unit identification number and component type on each component on the chart.

Example:

22

21

0010 GABAU

0011 GABAU

0012 GABAU

Figure 3-2. Filling Out the Rack Inventory Chart

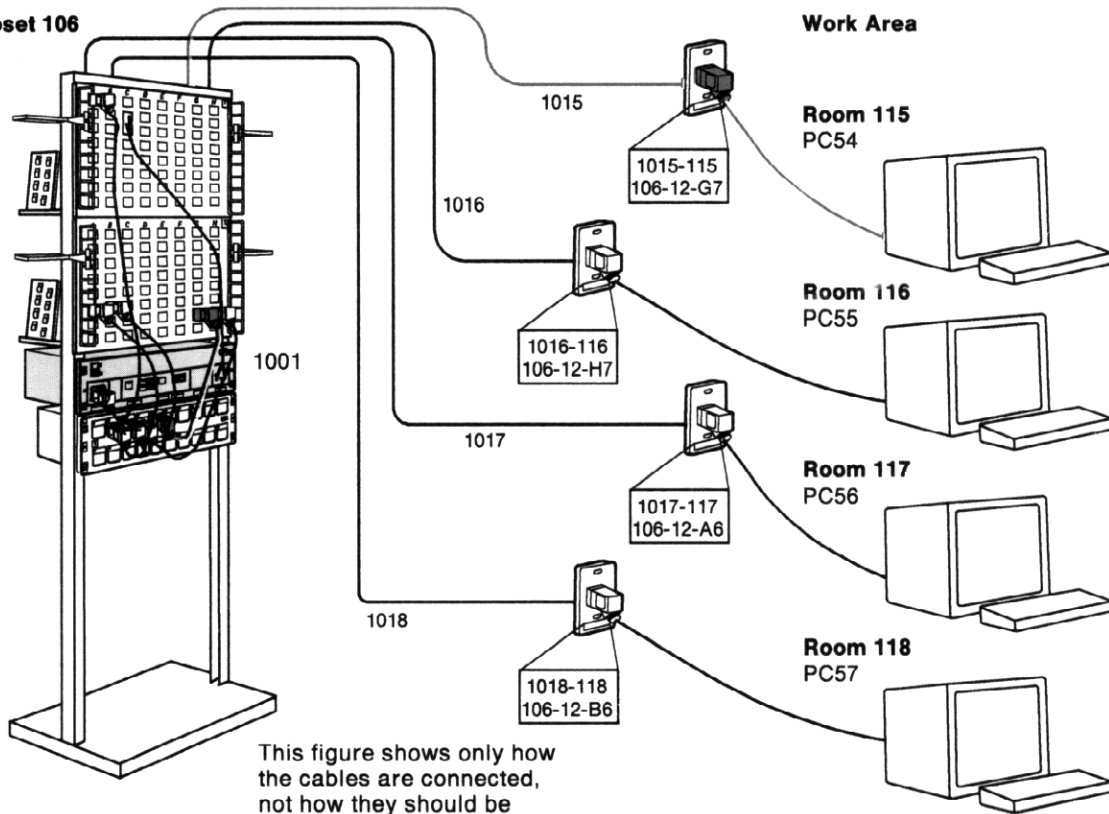
The IBM 8230 Cabling Chart

The IBM 8230 Cabling Chart is an ongoing record of all of the connections made to the 8230 LAM receptacles and to the ring in (RI) and ring out (RO) receptacles on the 8230 base unit. In addition, the IBM 8230 Cabling Chart records the location of the 8230, how many LAMs are associated with it, and the number of the ring it belongs to. In establishments that contain both 4 and 16 Mbps rings, you may want to assign ring numbers from 2 different series. For example, all 4 Mbps rings might have numbers assigned beginning with 1, whereas 16 Mbps ring numbers might all begin with 2. This cabling chart is used during installation and cabling of the 8230 and while performing problem determination procedures.

For each 8230 in the ring, first check the Rack Inventory Chart to see if there is enough space in the rack to install the 8230 and its associated LAMs.

Each 8230 should be located in the same rack as the distribution panel where its lobe and main ring path cables terminate. This will allow 2.4-m (8-ft) patch cables to reach between the 8230 and the distribution panel. Longer patch cables should be avoided since they increase the distance over which a signal has to be transmitted.

Wiring Closet 106



This figure shows only how the cables are connected, not how they should be routed.

IBM 8230 Cabling Chart cont. Unit # 1001 Page 2 of 2

LAM 1

Receptacle	1	2	3	4	5	6	7	8	9	10
Connect To:	106-12-G7	106-12-H7	106-12-A6	106-12-B6						
Device	PC54 File Serv.	PC55	PC56 Bridge	PC57						
Receptacle	11	12	13	14	15	16	17	18	19	20
Connect To:										
Device										

LAM 2

Receptacle	1	2	3	4	5	6	7	8	9	10
Connect To:										
Device										

LAM 3

Receptacle	1	2	3	4	5	6	7	8	9	10
Connect To:										
Device										

LAM 4

Receptacle	1	2	3	4	5	6	7	8	9	10
Connect To:										
Device										

IBM 8230 Cabling Chart Page 1 of 2

Section 1 Identification Unit Number: 1001 Date: 7-4-91

Check Appropriate Box

Ring Data Rate 4Mbps 10Mbps
 Lobe Cable Type Unshielded Twisted Pair Data Grade Media

Voltage Setting 110v 230v
 RI Module Copper Optical Fiber
 RD Module Copper Optical Fiber

Media Filter Wrap Plug

Physical Location Building Number: A
 Wiring Closet: 106
 Rack Number: 7
 Ring Number: 7

Addresses PO Address: 0005A9804000
 PI Address: 0005A9804001
 S Address: 0005A9804002

Section 2 Ring Connections

A. Connect RI of this 8230 to: Copper RI: 106-11-A1
 Optical Fiber RI:
 Orange:
 Black:

B. Connect RD of this 8230 to: Copper RD:
 Optical Fiber RD:
 Orange: 106-11-C2
 Black: 106-11-C3

Section 3 Lobe Attachment Module Connections

Number of Lobe Attachment Modules Connected to this IBM 8230: 7

Using the information recorded on the Cable Schedule and your rough sketch of your ring, record the following information on the IBM 8230 Cabling Chart:

1. The 8230 Unit Number (assign a 4-digit number, unique within your establishment).
2. The Date the chart is filled out.
3. Check the box indicating the Ring Data Rate (4 or 16 Mbps) at which this ring will operate.
4. Check the Lobe Cable Type you are using. If your planning has been done following the guidelines in this manual, you should always check Data Grade Media.
5. Check the Voltage Rate Setting that you will use to power the device. For most installations in North America, you should check 115v. For most installations in Europe and Asia, you should check 230v.
6. Check the type of cable that will attach to the RI and RO Modules. Consult your sketch and the IBM Cabling System Cable Schedules to determine the type of cable to be used.
7. If you have checked Data Grade Media under Lobe Cable Type above, check Wrap Plug. Otherwise, check Media Filter.
8. Under the heading Physical Location enter:
 - a. The building in which the 8230 is to be installed
 - b. The wiring closet number where the 8230 is to be placed
 - c. The Rack Number
 - d. The Ring Number (assign a unique number).

The section labeled Addresses will be filled out by the installer, so leave it blank.

9. In Section 2, Ring Connections:
 - Determine whether the RI and RO connections of the 8230 are copper or fiber.
 - Indicate the rack and distribution panel coordinates where the RI and RO cables will be connected.
10. In Section 3: Lobe Attachment Module Connections, indicate the quantity of LAMs connected to this 8230 base unit.
11. On page 2 of the 8230 Cabling Chart:
 - In the row marked Connect To:, indicate the rack and distribution panel coordinates where each lobe cable will be connected. See your Cable Schedule and the floor plan indicating the locations of attaching devices.
 - In the row marked Device, indicate the number of the attaching device connected to each lobe and the assigned function of the device such as file server, print server, bridge, or network manager.
 - Prepare an 8230 Unit Number label with the 4-digit number you have assigned to the 8230.
 - Prepare labels for each lobe receptacle.

The IBM 8228 Cabling Chart

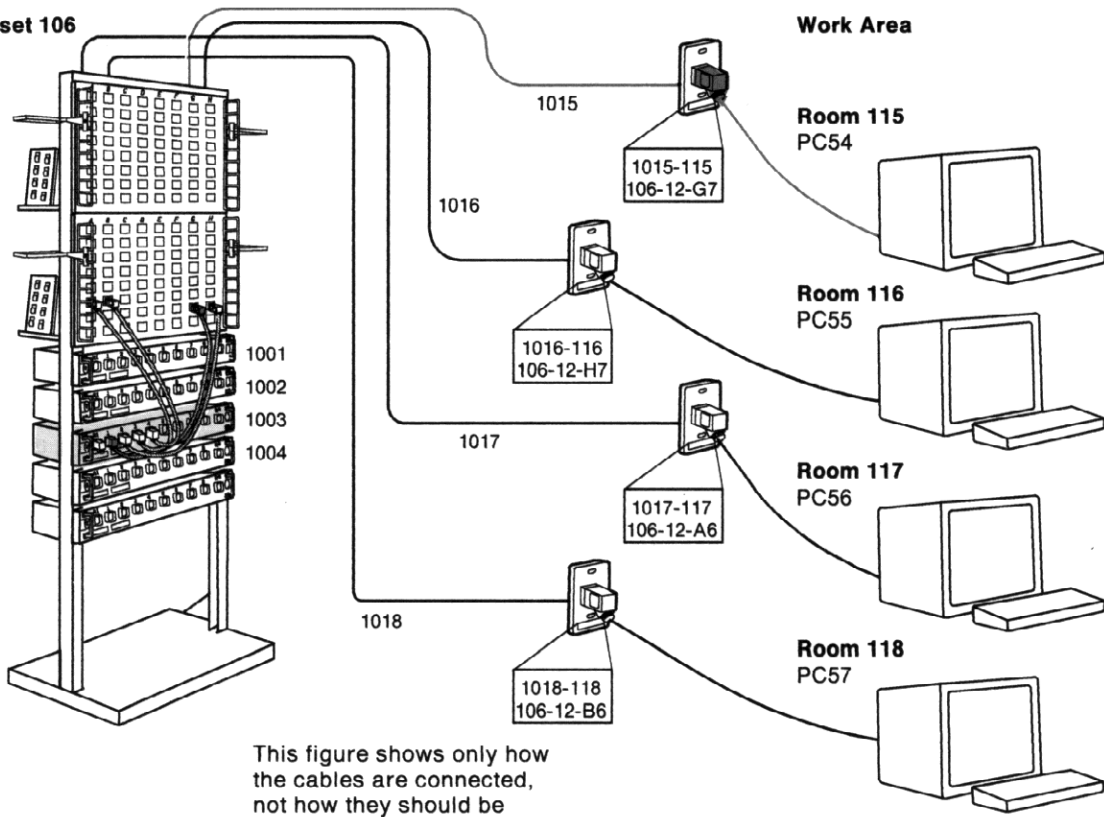
The IBM 8228 Cabling Chart is an ongoing record of all of the connections made to the 8228 lobe receptacles and to the RI and RO receptacles. In addition, the IBM 8228 Cabling Chart records the location of the 8228 and the number of the ring it belongs to. In establishments that contain both 4 and 16 Mbps rings, you may want to assign ring numbers from two different series. For example, all 4 Mbps rings might have numbers assigned beginning with 1, whereas 16 Mbps ring numbers might all begin with 2. This cabling chart is used during installation and cabling of the 8228 and while performing problem determination procedures.

IBM 8228s can be placed in racks in wiring closets or in wall-mounted component housings in work areas. When 8228s are placed in work areas, there must be two cables leading to the work area so that the RI and RO receptacles on the 8228 may be connected to the rest of the ring. Devices are connected to wall-mounted IBM 8228s using patch cables and/or adapter cables. See Appendix A to convert lengths of patch cables to equivalent lengths of type 1 or 2 cable.

For each 8228 in the ring, first check the Rack Inventory Chart to see if there is enough space in the rack to install the 8228.

In a wiring closet, each 8228 should be located in the same rack as the distribution panel where its lobe cables terminate. This will allow 2.4-m (8-ft) patch cables to reach between the 8228 lobe receptacle and the distribution panel. Longer patch cables should be avoided since they increase the distance over which a signal has to be transmitted. If the 8228 is located in a work area, it should be installed in a wall-mounted component housing.

Wiring Closet 106



This figure shows only how the cables are connected, not how they should be routed.

IBM 8228 Cabling Chart

Date 8-1-90

Section 1 Identification

Unit Number	<u>1003</u>	Building	<u>106</u>	Rack-mounted	<input checked="" type="checkbox"/>	Ring	<u>1</u>
		Location		Wall-mounted	<input type="checkbox"/>		

Section 2 Receptacle Connections

Receptacle	1	2	3	4	5	6	7	8
Connect to:	<u>106-12-G7</u>	<u>106-12-H7</u>	<u>106-12-A6</u>	<u>106-12-B6</u>				

Device	<u>PC54 FILE SER</u>	<u>PC55</u>	<u>PC56 BRIDGE</u>	<u>PC57</u>				
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Section 3 Ring Connections

A. Connect RI of this 8228 to: _____
 B. Connect RO of this 8228 to: _____

Figure 3-4. Filling Out the 8228 Cabling Chart

Using the information recorded on the Cable Schedule, record the following information on the IBM 8228 Cabling Chart:

1. The date the chart is filled out.
2. The 8228 Unit Number (assign a 4-digit number, unique within your establishment).
3. The building in which the 8228 is to be installed.
4. The wiring closet number or work area (Location) where the 8228 is to be placed.
5. Whether the 8228 is rack mounted or wall mounted.
6. The ring number (assign a unique number).
7. In the row marked Connect to:
 - If the 8228 is rack mounted, indicate the rack and distribution panel coordinates where each lobe cable will be connected. See your Cable Schedule and the floor plan indicating the locations of attaching devices.
 - If the 8228 is installed in a component housing, indicate the length of each cable between the lobe receptacle and the attaching device and the location of the attaching device.
8. In the row marked Device, the number of the attaching device connected to each lobe and the assigned function of the device such as file server, print server, bridge, or network manager.

Fill out the Ring Connections information in Section 3 of the IBM 8228 Cabling Chart after completing the Ring Sequence Chart.

Prepare an 8228 Unit Number label with the 4-digit number you have assigned to the 8228.

The IBM 8218 Cabling Chart

The IBM 8218 Cabling Chart records the location of a pair of 8218 Copper Repeaters and the number of the ring they belong to. This cabling chart is used during installation and cabling of the 8218s and while performing problem determination procedures.

IBM 8218s can be placed in racks in wiring closets or in surface-mounting brackets in work areas. When 8218s are placed in work areas, there must be two type 1 or 2 cables leading to the work area so that the ring in (RI) and ring out (RO) receptacles on the 8218 may be connected to the rest of the ring. These cables should be terminated at appropriate faceplates.

For each 8218 in a rack-mounting bracket, first check the Rack Inventory Chart to see if there is enough space in the rack to install the 8218 in its rack-mounting bracket at the bottom of the equipment rack. Since 8218s are always installed in pairs, you should be sure that two adjacent slots in the rack mounting bracket are available for installing a pair of 8218s to facilitate installation and problem determination.

If the 8218s are located in a work area, they should be installed in a wall-mounted component housing close to a properly grounded electrical outlet.

Record the following information on the IBM 8218 Cabling Chart:

1. The date the chart is filled out.
2. The ring number (assign a unique number).
3. The 8218 Unit Numbers (assign a 4-digit number, unique within your establishment to each 8218).
4. The building in which the 8218s are to be installed (Location).
5. The wiring closet number or work area where the 8218s are to be placed.
6. Whether the 8218s are rack mounted or wall mounted.

Fill out the Ring Connections information in Section 2 of the IBM 8218 Cabling Chart after completing the Ring Sequence Chart.

Prepare an 8218 Unit Number label with the 4-digit number you have assigned for each 8218.

IBM 8218 Cabling Chart

Section 1

Date 12/18/90
Ring 1
2001 Unit Number 2002
Building A
Location A140-1

Rack-Mounted
Wall-Mounted

Section 2

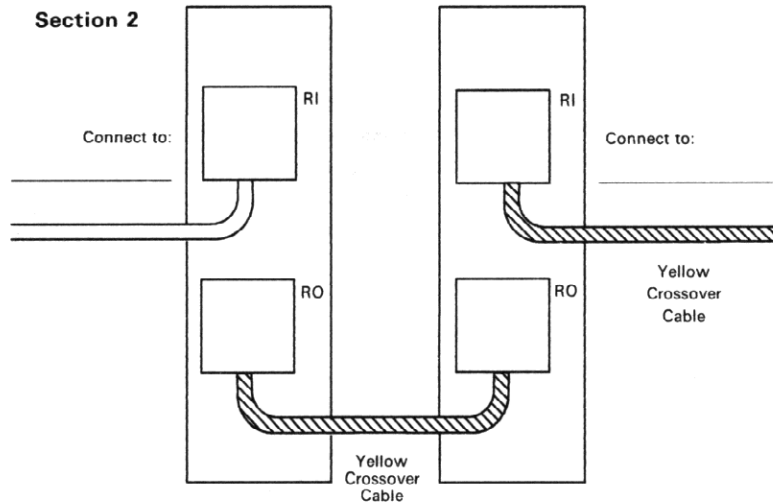


Figure 3-5. Filling Out the 8218 Cabling Chart

The IBM 8219 Cabling Chart

The IBM 8219 Cabling Chart records the locations of a pair of 8219 Optical Fiber Repeaters and the number of the ring they belong to. This cabling chart is used during installation and cabling of the 8219s and while performing problem determination procedures.

IBM 8219s can be placed in racks in wiring closets or in wall-mounted brackets in work areas.

For each 8219 in the ring, first check the Rack Inventory Chart to see if there is enough space in the rack to install the 8219 in its rack-mounting bracket at the bottom of the equipment rack.

In a wiring closet, each 8219 should be located in the same rack as the distribution panel where its cables terminate. This will allow the optical fiber patch cables to reach between the 8219 Transmit and Receive BNC connectors and the distribution panel. If the 8219 is located in a work area, it should be installed in a surface-mounting bracket close to a properly grounded electrical outlet.

Record the following information on the IBM 8219 Cabling Chart:

1. The date the chart is filled out.
2. The ring number (assign a unique number).
3. The 8219 Unit Numbers (assign a 4-digit number, unique within your establishment for each 8219).
4. The building in which each 8219 is to be installed.
5. The wiring closet number or work area (Location) where each 8219 is to be placed.
6. Whether each 8219 is rack mounted or wall mounted.

Fill out the Ring Connections information in Section 2 of the IBM 8219 Cabling Chart after completing the Ring Sequence Chart.

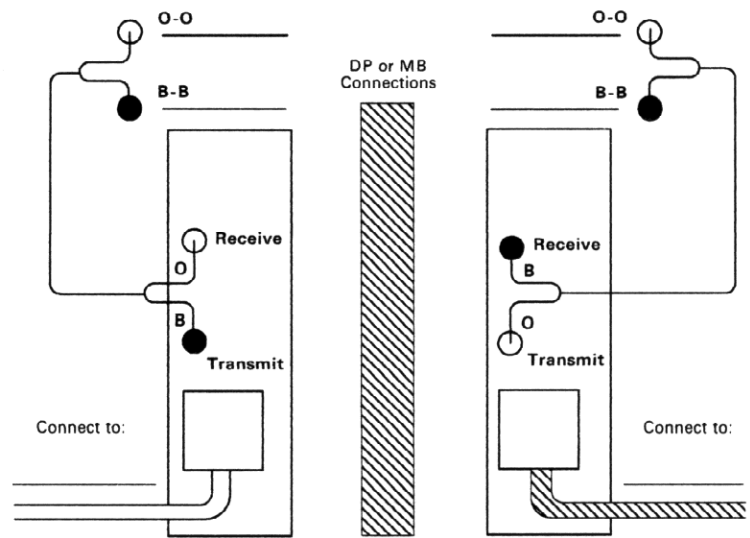
Prepare an 8219 Unit Number label with the 4-digit number you have assigned for each 8219.

IBM 8219 Cabling Chart

Section 1 Date 12/18/90
 Ring 1
4001 Unit Number 4002
C Building A
C70-1 Location A100-1

Rack-Mounted
 Wall-Mounted

Section 2



Yellow Crossover Cable
 or
 Patch Cable

B = Black
 O = Orange
 MB = Optical Fiber Cable Mounting Bracket
 DP = Distribution Panel

Figure 3-6. Filling Out the 8219 Cabling Chart

The IBM 8220 Cabling Chart

The IBM 8220 Cabling Chart records the locations of a pair of 8220 Optical Fiber Converters and the number of the ring they belong to. This cabling chart, which describes completely a single optical fiber subsystem, is used during installation and cabling of the 8220s and while performing problem determination procedures. An optical fiber subsystem consists of a pair of 8220s connected together by optical fiber cable.

IBM 8220s can be placed in racks in wiring closets or in wall-mounted brackets in work areas.

For each 8220 in the ring, first check the Rack Inventory Chart to see if there is enough space in the rack to install the 8220 in its rack-mounting bracket at the bottom of the equipment rack.

In a wiring closet, each 8220 should be located in the same rack as the distribution panel where its cables terminate. This will allow the optical fiber patch cables to reach between the 8220 Transmit and Receive BNC connectors and the distribution panel. If the 8220 is located in a work area, it should be installed in a surface-mounting bracket close to a properly grounded electrical outlet.

Record the following information on the IBM 8220 Cabling Chart:

1. The date the chart is filled out.
2. The ring number (assign a unique number).
3. The data rate of the ring.
4. The 8220 Unit Numbers (assign a 4-digit number, unique within your establishment for each 8220).
5. The building in which each 8220 is to be installed.
6. The wiring closet number or work area (Location) where each 8220 is to be placed. As you assign 8220s to wiring closets, remember that the 8220 on the left of the chart must be connected to the ring out (RO) side of an IBM 8228; the 8220 on the right side of the chart must be connected to the ring in (RI) side of the next IBM 8228 in the ring.
7. The universally administered address for each 8220 (recorded at time of installation).
8. Whether each 8220 is rack mounted or wall mounted.

Fill out the Ring Connections information in Section 2 of the IBM 8220 Cabling Chart after completing the Ring Sequence Chart.

Prepare an 8220 Unit Number label with the 4-digit number you have assigned for each 8220.

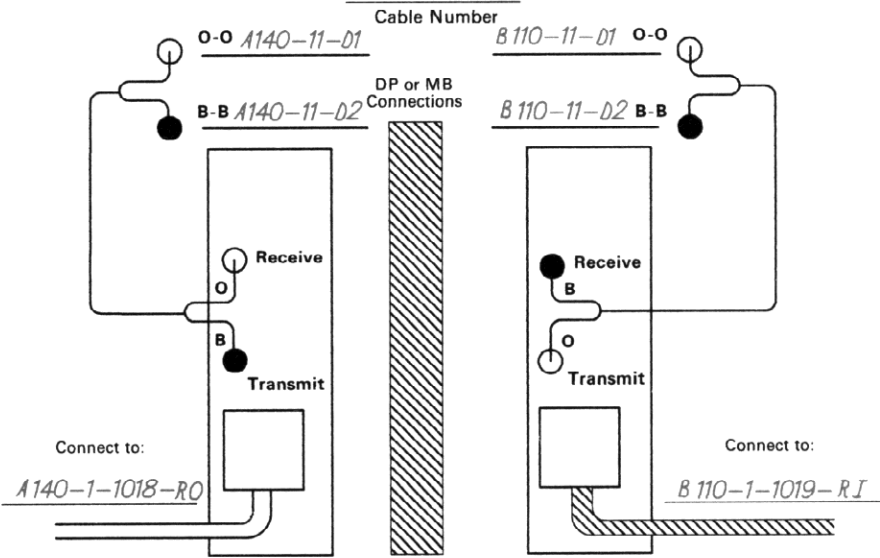
IBM 8220 Cabling Chart

Section 1 Ring# 2 Date 3/24/90
 Ring Data Rate 4 16

RI (Upstream)	RI/RO Switch Settings	RO (Downstream)
<u>2001</u>	Unit Number <u>2002</u>	
<u>A</u>	Building <u>B</u>	
<u>10005A000012</u>	Location	
	Address <u>10005A000013</u>	

Rack Mount
 Wall Mount

Section 2



- Yellow Crossover Cable or Black Patch Cable
- B = Black
- O = Orange
- MB = Optical Fiber Cable Mounting Bracket
- DP = Distribution Panel

Figure 3-7. Filling Out the 8220 Cabling Chart

The Ring Sequence Chart

The Ring Sequence Chart is used as a worksheet for cabling together the 8230s, 8228s, 8218s, 8219s, and 8220s that form the main ring path. This chart serves as an ongoing record of your ring's physical structure so that you have a basis for changing the network and a guide for use while performing problem determination procedures.

The Ring Sequence Chart has been designed so that you can identify all components and cables in the main ring path. Each of the rectangles on the chart can be used to identify an 8230, 8228, 8218, 8219, 8220, a distribution panel coordinate, or a surge suppressor. The signal flow through the network is from the top of the form to the bottom. The lines between the rectangles represent patch cables of various types and wiring closet-to-wiring closet cables.

The rough sketch of the ring that you used to help determine the allowable drive distance and the placement of 8218 Copper Repeaters, 8219 Optical Fiber Repeaters, and 8220 Optical Fiber Converters in the main ring path will help you fill out the Ring Sequence Chart. Sort the 8230, 8228, 8218, 8219, and 8220 Cabling Charts by wiring closet or work area location. Using the rough sketch and the Rack Inventory Charts, arrange the 8230, 8228, 8218, 8219, and 8220 Cabling Charts in the order in which the devices will be installed in the main ring path.

Steps in the following procedure that call for an entry on the chart have a step number corresponding to a callout on Figure 3-8 on page 3-22. Now you are ready to begin filling out the Ring Sequence Chart.

To fill out the Ring Sequence Chart:

1. Write the ring number, data rate for this ring (either 4 or 16 Mbps), the date, and the page number at the top of the chart.
2. Choose a starting point for the ring. For a ring that is contained in a single rack, start with the topmost 8230 or 8228 in the rack. For a ring that passes through several racks, pick the first 8230 or 8228 (the one closest to the top of the rack) in the first rack (according to the IBM Cabling System labeling conventions) in any of the wiring closets.
3. In the first rectangle on the form, write the component type ("CAU" for an IBM 8230 Controlled Access Unit or "MSAU" for an IBM 8228 Multistation Access Unit) and Unit Number of the 8230 or 8228 you have just identified. Write its location (wiring closet and rack number) below the line.

4. If the next component is an 8230 or 8228 connected to the first by a patch cable, write "P" in the blank space in the middle of the line connecting the two rectangles. Record the length of the patch cable in the same place. Standard patch cable lengths are 2.4 m (8 ft), 9 m (30 ft), 23 m (75ft), and 46 m (150 ft). For each subsequent 8230 or 8228 that is in the same rack as the first two, repeat this step until all of the 8230s and 8228s in the rack have been recorded on the Ring Sequence Chart.

Note: An example of a Ring Sequence Chart for an all-8230 ring is shown on the chart in the pocket in the back of this book.

- If the next components in the main ring path are a pair of 8218s, go to step 5.
- If the next component in the main ring path is a surge suppressor, go to step 6.
- If the next component in the main ring path is an 8219, go to step 7.
- If the next component in the main ring path is an 8220, go to step 8.
- If the next component is in another rack or in a work area, go to step 9.
- If you have reached the bottom of the chart, go to step 10.

Note: After going to any of the steps listed above, you should return to this step for further instructions.

- If you have recorded all of the 8230s or 8228s in the network, go to the last step in this procedure (step 11).

5. If the next components in your main ring path are a pair of 8218s:
 - a. Enter "P" in the blank space following the last filled-in rectangle to indicate that a patch cable connects the last component to the 8218.
 - b. In the rectangle, enter "RPTR" and the unit number of the first of the pair of 8218s. Enter its location under the line.
 - c. Enter "YCP" in the blank space following the last filled-in rectangle to indicate that a yellow crossover patch cable connects the *Ring Out* connector of the first repeater to the *Ring Out* of the second in the pair.
 - d. In the next blank rectangle, enter "RPTR," the unit number, and location of the second of the two 8218s.
 - e. In the blank space following the filled-in rectangle, enter "YCP" for the yellow crossover patch cable that leads to the next component.
 - f. See the section of this chapter called "Filling Out Section 2 of the IBM 8218 Cabling Chart" and fill out Section 2 of the chart for this pair of 8218s.
 - g. Go back to step 4.
6. If the next component in the main ring path is a surge suppressor:
 - a. Enter "SS" above the line in the next rectangle on the form.
 - b. Assign a unit number to the surge suppressor and write it next to "SS" in the rectangle.
 - c. Write the location below the line in the rectangle.
 - d. In the blank below the rectangle, record the number of the cable leaving the surge suppressor.
 - e. Go back to step 4.

7. If the next component in your main ring path is an 8219:
 - a. Enter "P" in the blank space following the last filled-in rectangle on the chart.
 - b. In the next rectangle, write "OFRPTR" (for optical fiber repeater) and its unit number above the line. Write its location below the line.
 - c. Write "OFF" in the blank space following the filled-in rectangle (to indicate the use of an optical fiber BNC-to-biconic patch cable).
 - d. In the next rectangle, enter "DP" and the distribution panel coordinates for the optical fiber cable that leads to the next wiring closet.
 - e. In the blank following the filled-in rectangle, enter the number of the optical fiber cable that leads to the next component in the main ring path.
 - f. In the next rectangle, enter "DP" and the distribution panel coordinates where the optical fiber cable terminates.
 - g. In the blank following the rectangle, enter "OFF."
 - h. In the next rectangle, enter the "OFRPTR," its unit number, and its location.
 - i. Enter "YCP" for yellow crossover patch cable in the blank following the filled-in rectangle.
 - j. See the section in this chapter called "Section 2 of the IBM 8219 Cabling Chart" for instructions on completing the information on that chart.
 - k. Go back to step 4.

8. If the next component in your main ring path is an 8220:
 - a. Enter "P" in the blank space following the last filled-in rectangle on the chart.
 - b. In the next rectangle, write "OFCVTR" (for optical fiber converter) and its unit number above the line. Write its location below the line.
 - c. Write "OFF" in the blank space following the filled-in rectangle (to indicate the use of an optical fiber BNC-to-biconic patch cable).
 - d. In the next rectangle, enter "DP" and the distribution panel coordinates for the optical fiber cable that leads to the next wiring closet.
 - e. In the blank following the filled-in rectangle, enter the number of the optical fiber cable that leads to the next component in the main ring path.
 - f. In the next rectangle, enter "DP" and the distribution panel coordinates where the optical fiber cable terminates.
 - g. In the blank following the rectangle, enter "OFF."
 - h. In the next rectangle, enter the "OFCVTR," its unit number, and location.
 - i. Enter "YCP" for yellow crossover patch cable in the blank following the filled-in rectangle.
 - j. See the section in this chapter called "Section 2 of the IBM 8220 Cabling Chart" for instructions on completing the information on that chart.
 - k. Go back to step 4.

9. Record all of the cables and components in the ring as you trace your system from rack to rack. Use "DP" to abbreviate Distribution Panel or "FP" to abbreviate faceplate. Be sure to record the correct cable number and termination point for each of the wiring closet-to-wiring closet cables. If your ring connections go from wiring closet to wiring closet, the entries on the Ring Sequence Chart will be similar to those shown at callout 8 in Figure 3-8 on page 3-22. Go back to step 4.
10. When you change pages on the Ring Sequence Chart, indicate the cable at the bottom of the completed form and at the top of the form you are starting, as shown at callout 9 in Figure 3-8 on page 3-22. Go back to step 4.
11. Remember that the last component in the sequence and the RI of the first 8230 or 8228 shown on your form must be connected.
 - a. If the last and first components are in the same wiring closet, connect them with a patch cable and show the connection on the Ring Sequence Chart.
 - b. If the last and first components are not in the same wiring closet, the entries on your Ring Sequence Chart will be similar to the ones in Figure 3-8 on page 3-22.

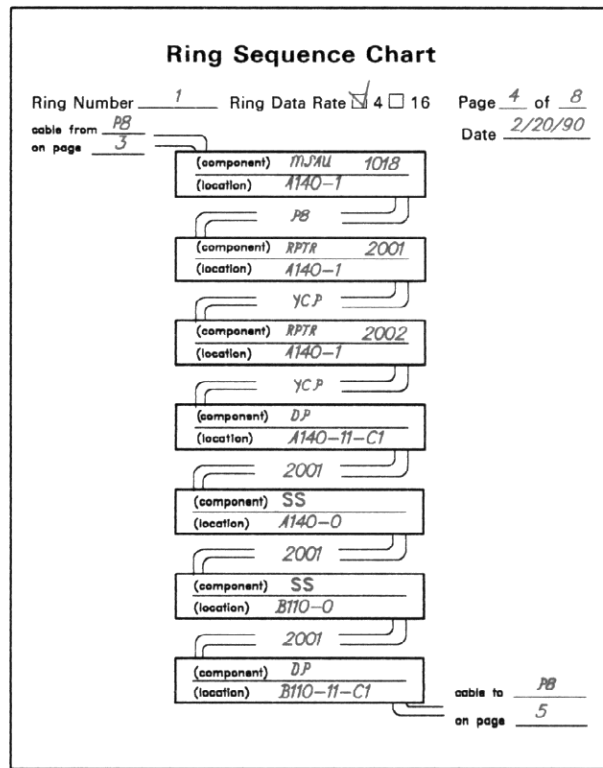
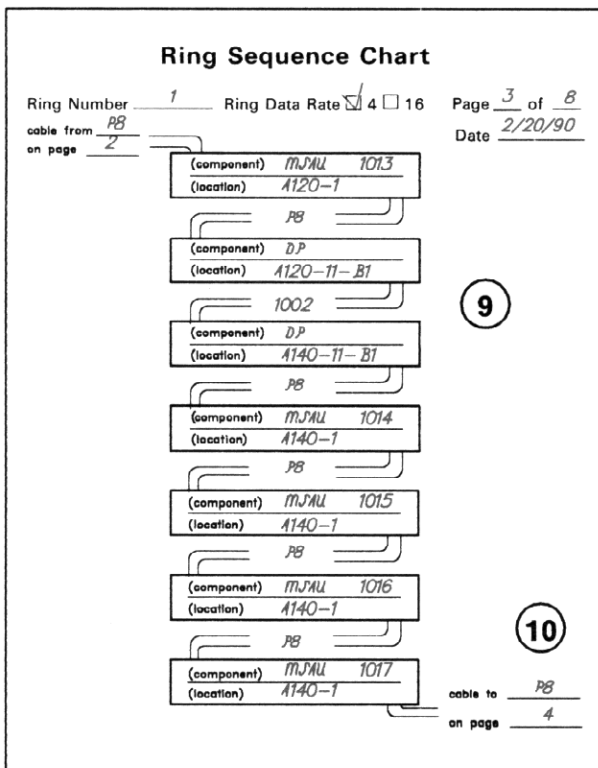
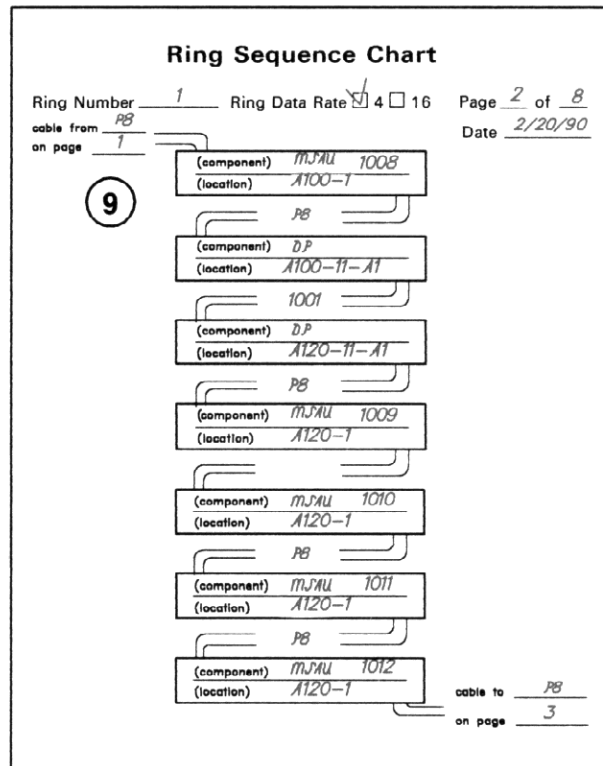
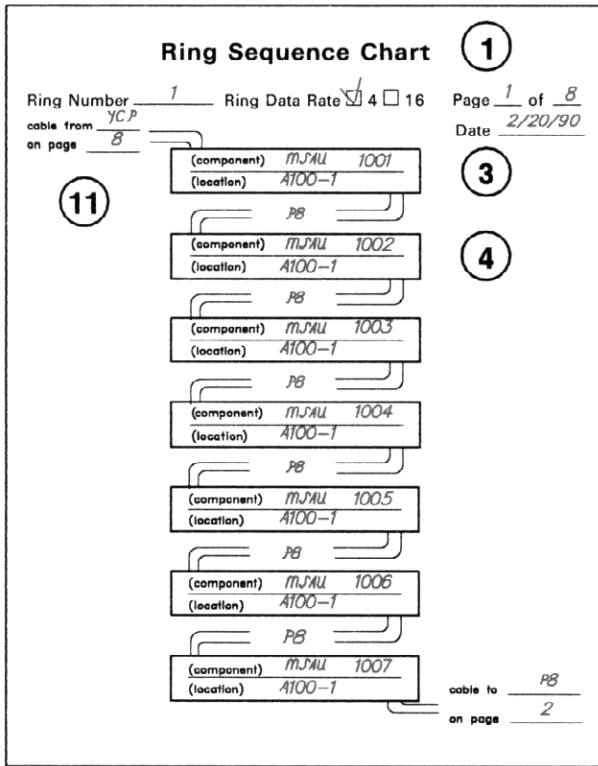


Figure 3-8. Filling Out the Ring Sequence Chart

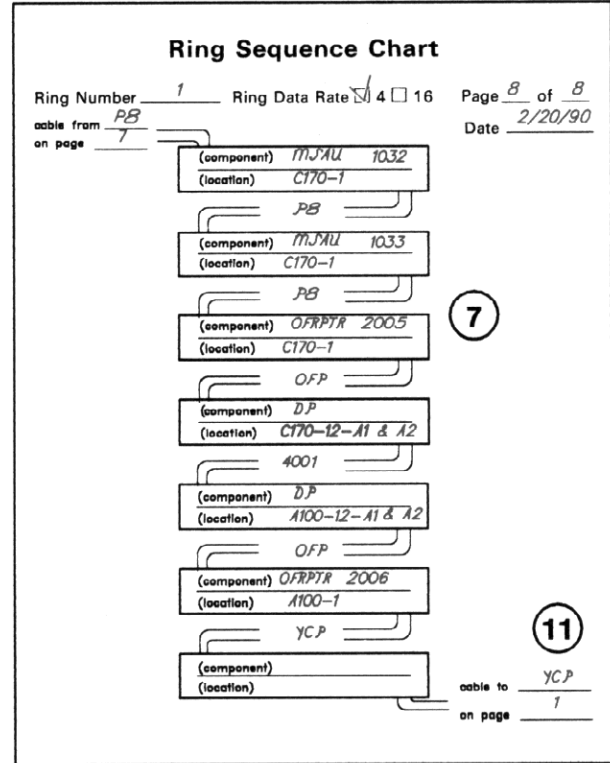
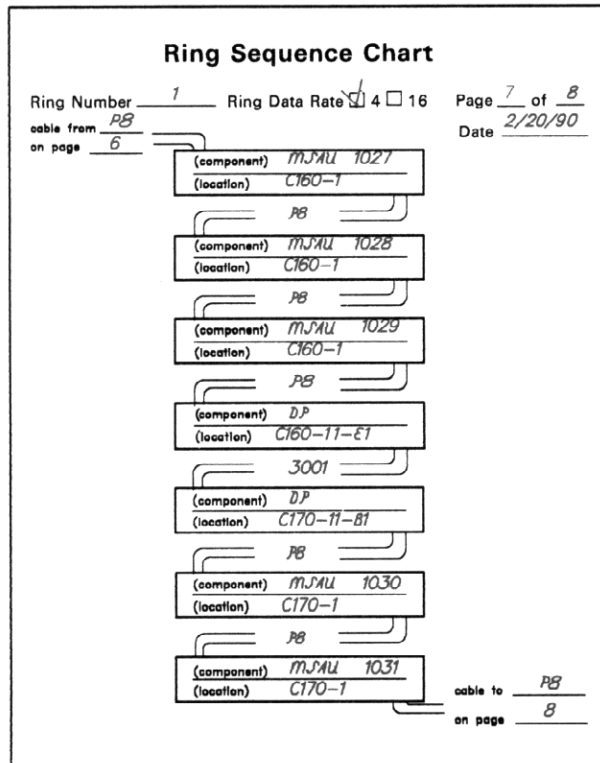
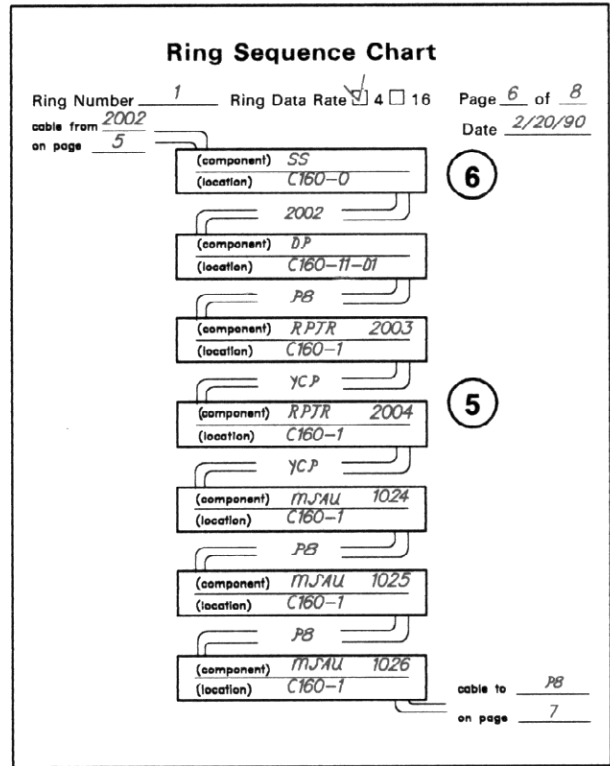
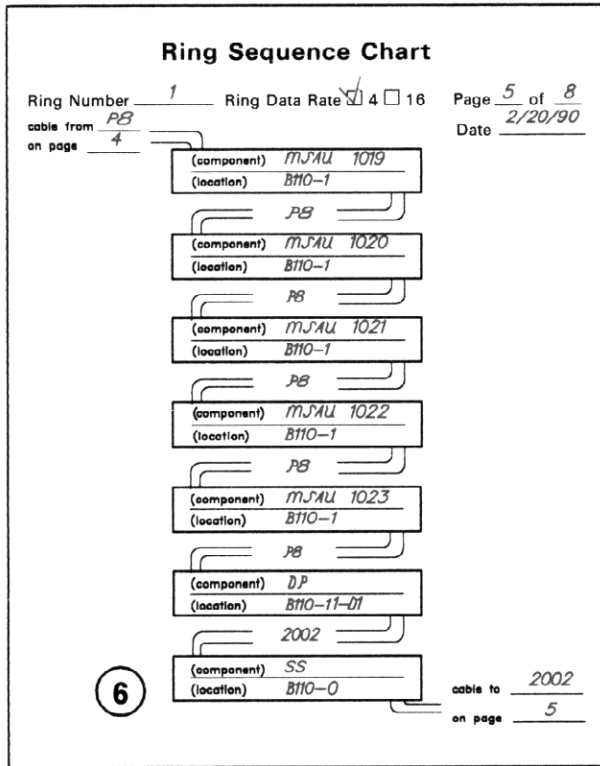


Figure 3-9. Filling Out the Ring Sequence Chart (cont.)

Section 3 of the IBM 8228 Cabling Chart

Using the Ring Sequence Chart as a reference, in Section 3 of the IBM 8228 Cabling Chart indicate the component connected to the RI receptacle of that unit and the component connected to the RO receptacle. Figure 3-10 illustrates the correct way to fill out Section 3 of the IBM 8228 Cabling Chart.

Ring Sequence Chart

Ring Number 1 Ring Data Rate 4 16 Page 1 of 2
 cable from PB Date 8-1-90
 on page 2

(component) MSAU 1001
 (location) 106-1

PB

(component) MSAU 1002
 (location) 106-1

PB

(component) MSAU 1003
 (location) 106-1

PB

(component) DP
 (location) 106-11-A1

6001

(component) DP
 (location) 138-11-A1

PB

(component) MSAU 1004
 (location) 138-1

PB

(component) MSAU 1005
 (location) 138-1

cable to PB
on page 2

Suggested Abbreviations
 DP - Distribution Panel P - Patch Cable
 MSAU - Multistation Access Unit

IBM 8228 Cabling Chart

Date 8-1-90

Section 1 Identification

Unit Number <u>1003</u>	Building <u>105</u>	Rack-mounted <input type="checkbox"/>	Ring <u>1</u>
Location <u>A</u>	Wall-mounted <input type="checkbox"/>		

Section 2 Receptacle Connections

Receptacle	1	2	3	4	5	6	7	8
Connect to:	<u>106-12-G7</u>	<u>106-12-37</u>	<u>106-12-48</u>	<u>106-12-88</u>				

Device	<u>PC54</u> <u>PC55</u> <u>PC56</u>	<u>PC55</u>	<u>PC56</u> <u>PC57</u>				
--------	---	-------------	----------------------------	--	--	--	--

Section 3 Ring Connections

A. Connect RI of this 8228 to:	<u>106-1-100220-RO</u>
B. Connect RO of this 8228 to:	<u>106-11-A1</u>

Figure 3-10. Filling Out Section 3 of the IBM 8228 Cabling Chart

Section 2 of the IBM 8218 Cabling Chart

Section 2 of the IBM 8218 Cabling Chart shows a pair of IBM 8218 Copper Repeaters with the necessary patch cable and yellow crossover patch cable connections illustrated. Using the Ring Sequence Chart as a reference, enter the location, component number, and receptacle of the component immediately upstream from the first 8218 on the Connect To: line on the left of the chart. On the Connect To: to the right of the second 8218, enter the location, component number, and connector of the component downstream from the second 8218 shown on the chart.

Figure 3-11 shows a representative sample of how Section 2 of the IBM 8218 Cabling chart might be filled out.

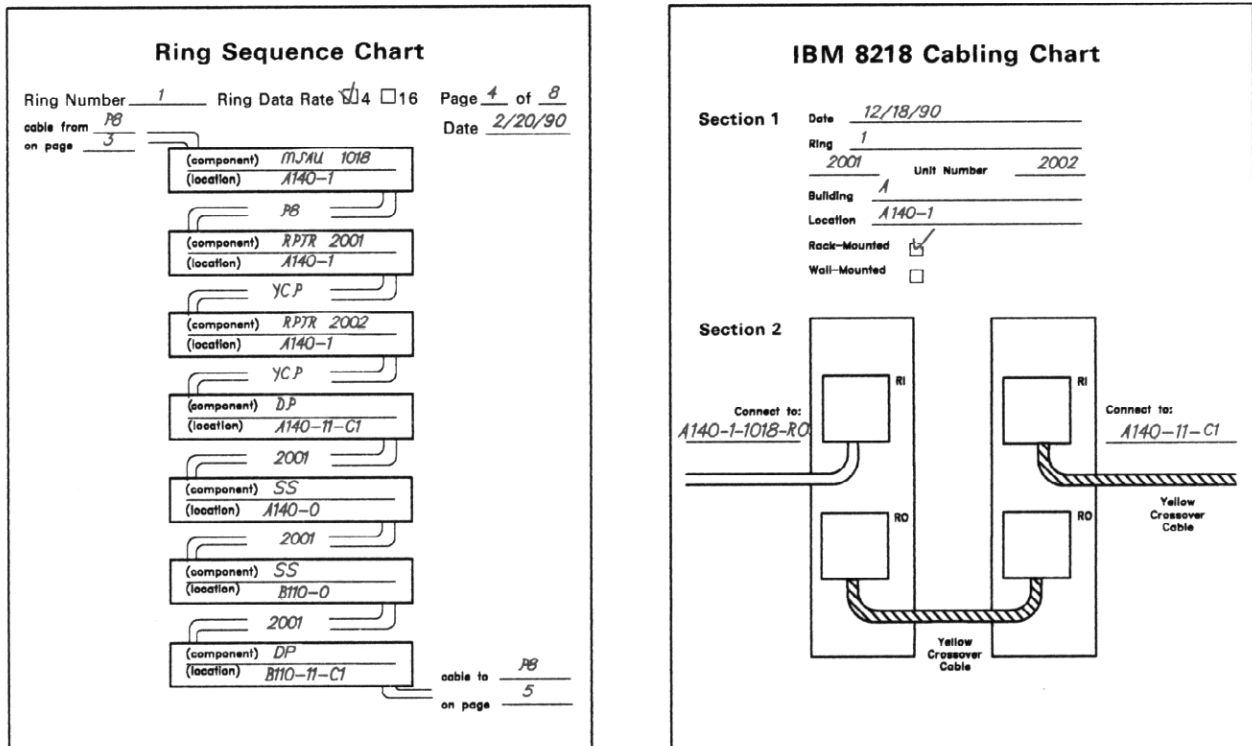


Figure 3-11. Filling Out Section 2 of the 8218 Cabling Chart

Section 2 of the IBM 8219 Cabling Chart

Section 2 of the IBM 8219 Cabling Chart shows a pair of IBM 8219 Optical Fiber Repeaters with the appropriate patch cables attached. Using the Ring Sequence Chart as a reference, enter the cable number of the optical fiber cable connecting the two 8219s. Then, enter the location, component number, and receptacle of the component immediately upstream from the first 8219 on the Connect To: line on the left of the chart. If the ring component to which this cable attaches is an 8228 or 8230, check the patch cable box below this cable. If the ring component is another 8219, check the box for yellow crossover patch cable.

Fill in the two MB or DP Connections: lines above and to the right of the first 8219 with the wall bracket or distribution panel coordinates for that 8219's connection to the optical fiber cable between wiring closets.

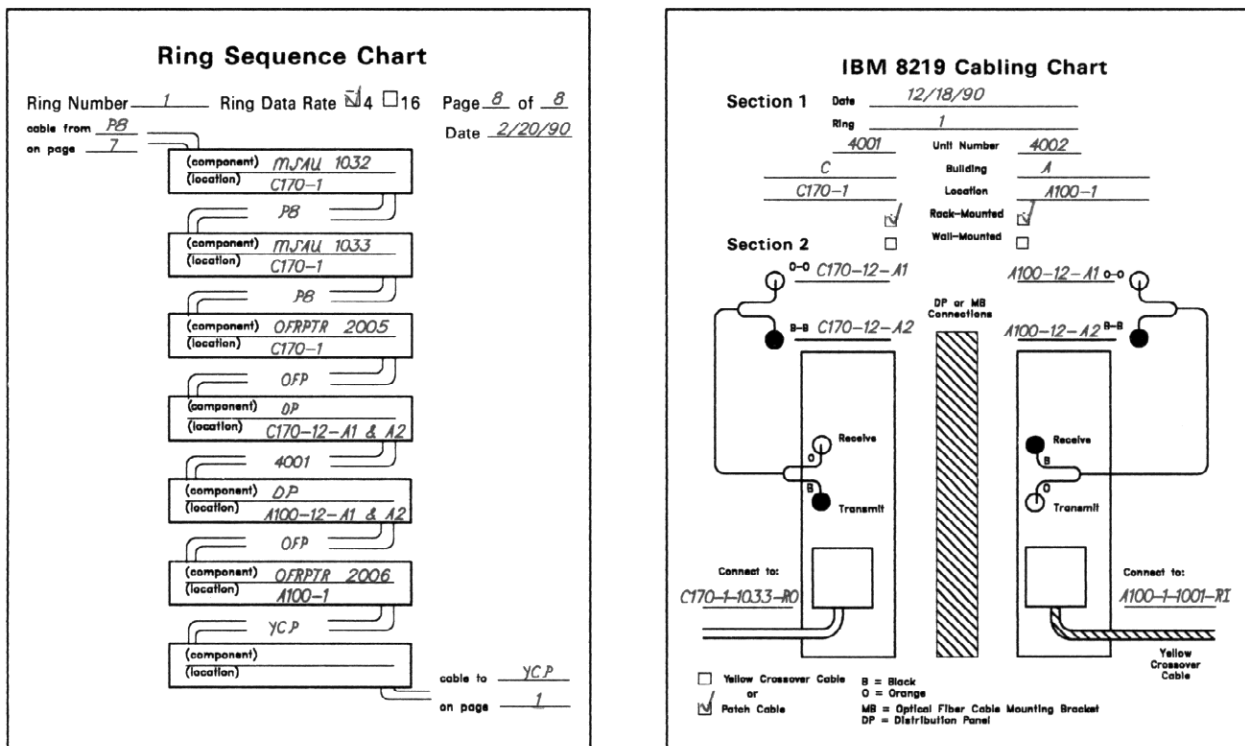


Figure 3-12. Filling Out Section 2 of the 8219 Cabling Chart

Fill in the pair of MB or DP Connections: lines above and to the left of the second 8219 with the wall bracket or distribution panel coordinates where the optical fiber cable terminates in the next wiring closet.

Fill in the Connect To: line to the right of the second 8219 with the location, component number, and receptacle of the device immediately downstream of the second 8219.

Figure 3-12 illustrates filling out Section 2 of the 8219 Cabling Chart.

Section 2 of the IBM 8220 Cabling Chart

Section 2 of the IBM 8220 Cabling Chart shows a pair of IBM 8220 Optical Fiber Converters with the appropriate patch cables attached. Using the Ring Sequence Chart as a reference, enter the cable number of the optical fiber cable connecting the two 8220s. Then, enter the location, unit number, and receptacle of the component immediately upstream from the first 8220 on the Connect To: line on the left of the chart. If the ring component to which this cable attaches is an 8228 or 8230, check the patch cable box below this cable. If the ring component is another 8220, check the box for yellow crossover patch cable.

Fill in the two MB or DP Connections: lines above and to the right of the first 8220 with the wall bracket or distribution panel coordinates for that 8220's connection to the optical fiber cable between wiring closets.

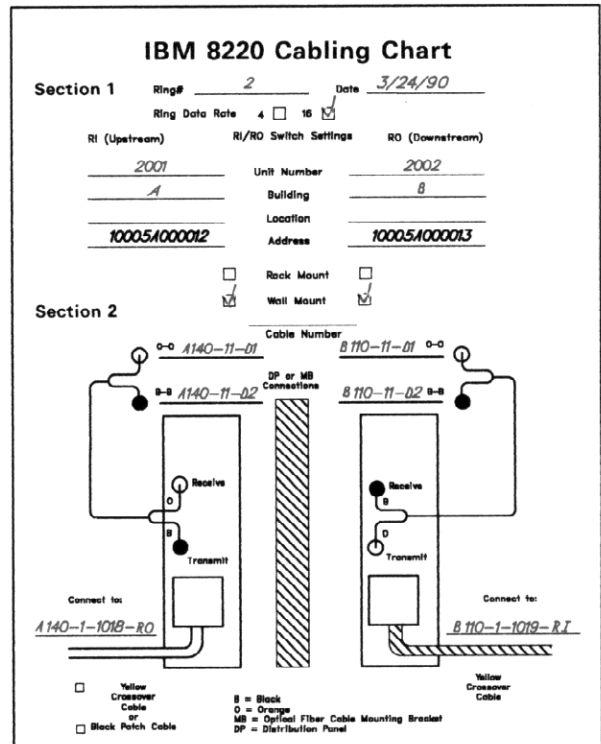
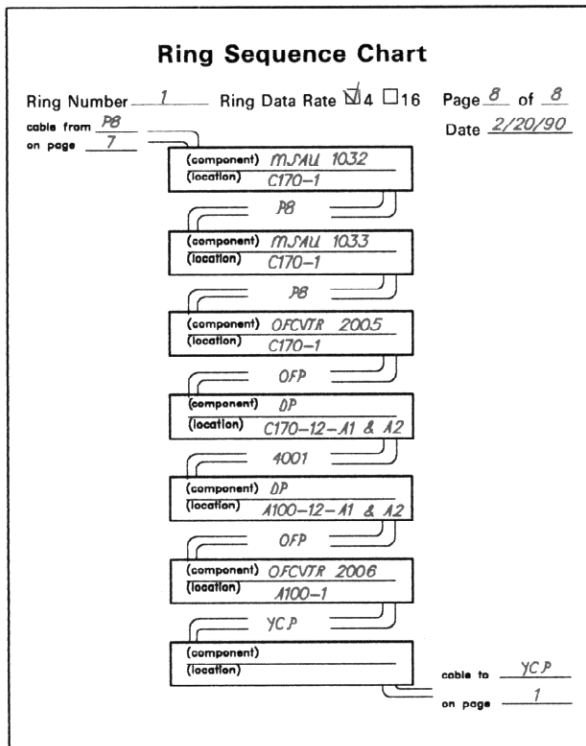


Figure 3-13. Filling Out Section 2 of the 8220 Cabling Chart

Fill in the pair of MB or DP Connections: lines above and to the left of the second 8220 with the wall bracket or distribution panel coordinates where the optical fiber cable terminates in the next wiring closet.

Fill in the Connect To: line to the right of the second 8220 with the location, component number, and receptacle of the device immediately downstream of the second 8220.

The Locator Charts

Each of the attaching devices in your establishment is assigned to a specific physical location. Further, each attaching device has a unique identification number. You have used these identifiers to indicate specific attaching devices on your planning documents.

On the network, however, an attaching device is known not by its location or assigned identification number, but by its adapter address. This address may be one of two types: universally administered or locally administered (see Chapter 1). Find out the adapter's address after installing the card in each device (See the adapter documentation).

Adapter Address to Physical Location Locator Chart					Physical Location to Adapter Address Locator Chart				
Adapter Address	Physical Location	Device Identification	Ring Number	IBM Access Unit No.	Physical Location	Adapter Address	Device Identification	Ring Number	IBM Access Unit No.
10005A000000	10.0	PC 4.0	/	100.1	10.0	10005A000000	PC 4.0	/	100.1
10005A000001	10.1	PC 4.1	/	100.1	10.1	10005A000001	PC 4.1	/	100.1
10005A000002	10.2	PC 4.2 <i>file server</i>	/	100.1	10.2	10005A000002	PC 4.2 <i>file server</i>	/	100.1
10005A000003	10.3	PC 4.3	/	100.1	10.3	10005A000003	PC 4.3	/	100.1
10005A000004	10.4	PC 4.4	/	100.1	10.4	10005A000004	PC 4.4	/	100.1
10005A000005	10.5	PC 4.5 <i>bridge</i>	/	100.1	10.5	10005A000005	PC 4.5 <i>bridge</i>	/	100.1
10005A000006	10.6	PC 4.6	/	100.1	10.6	10005A000006	PC 4.6	/	100.1
10005A000007	10.7	PC 4.7	/	100.2	10.7	10005A000007	PC 4.7	/	100.2
10005A000008	10.8	PC 4.8	/	100.2	10.8	10005A000008	PC 4.8	/	100.2
10005A000009	10.9	PC 4.9	/	100.2	10.9	10005A000009	PC 4.9	/	100.2
10005A00000A	11.0	PC 5.0	/	100.2	11.0	10005A00000A	PC 5.0	/	100.2
10005A00000B	11.1	PC 5.1	/	100.2	11.1	10005A00000B	PC 5.1	/	100.2
10005A00000C	11.2	PC 5.2	/	100.2	11.2	10005A00000C	PC 5.2	/	100.2
10005A00000D	11.3	PC 5.3	/	100.2	11.3	10005A00000D	PC 5.3	/	100.2
10005A00000E	11.4	PC 5.4	/	100.3	11.4	10005A00000E	PC 5.4	/	100.3
10005A980400	11.5	CAU - PO	/	100.3	11.5	10005A980400	CAU - PO	/	100.3
10005A980401	11.5	CAU - PJ	/	100.3	11.5	10005A980401	CAU - PJ	/	100.3
10005A980402	11.5	CAU - J	/	100.3	11.5	10005A980402	CAU - J	/	100.3

Figure 3-14. Filling Out the Locator Charts

In addition, IBM 8220 Optical Fiber Converters have a universally administered address. This converter address is recorded on a label placed on the 8220 when it is manufactured. The IBM 8230 Controlled Access Unit has three universally administered addresses: PI, PO, and S. These addresses are recorded on a label placed on the 8230 base unit when it is manufactured. All of these addresses must also be recorded on the locator charts.

The locator charts relate the adapter, 8220, or 8230 base unit addresses to the physical location and device identification numbers. These charts are vital for problem determination and must be kept current. No IBM 8228 Multistation Access Unit number is associated with converters, so leave that column blank on both locator charts. On the Adapter Address to Physical Location Locator Chart, record adapter, converter, and 8230 base unit addresses of all devices in the network in numerical order. On the Physical Location to Adapter Address Locator Chart, record the physical locations of all devices arranged by building and room number.

In the Device Identification column on both charts, in addition to entering the device identification, you should also indicate such functions as converters, print servers, file servers, gateways, and bridges.

Filling Out the Network Ordering Worksheet

The information needed to fill out the Network Ordering Worksheet can be derived from your completed Ring Sequence Charts and IBM 8230, 8228, 8218, 8219, and 8220 Cabling Charts. You will need to know the following:

- The number of IBM 8230 Controlled Access Units, including
 - The number of Lobe Attachment Modules
 - The number of IBM Optical Fiber Converter Modules
 - The number of 4 Mbps Media Filters (Used only in networks with telephone twisted-pair lobes. See the *IBM Token-Ring Network Telephone Twisted-Pair Media Guide* for further information.).
- The number of rack-mounted IBM 8228s (from the IBM 8228 Cabling Charts)
- The number of wall-mounted IBM 8228s (from the IBM 8228 Cabling Charts)
- The number of rack-mounted IBM 8218s (from the IBM 8218 Cabling Charts)
- The number of wall-mounted IBM 8218s (from the IBM 8218 Cabling Charts)
- The number of rack-mounted IBM 8219s (from the IBM 8219 Cabling Charts)
- The number of wall-mounted IBM 8219s (from the IBM 8219 Cabling Charts)
- The number of rack-mounted IBM 8220s (from the IBM 8220 Cabling Charts)
- The number of wall-mounted IBM 8220s (from the IBM 8220 Cabling Charts)
- The number of 2.4-m (8-ft), 9-m (30-ft), 23-m (75-ft), and 46-m (150-ft) patch cables in the main ring path (from the Ring Sequence Charts)
- The number of patch cables of each length used on all the lobes in the ring (count the number of active lobes recorded on the IBM 8230 and 8228 Cabling Charts)
- The number of yellow crossover patch cables (from the 8218, 8219, and 8220 Cabling Charts)
- The number of optical fiber BNC-to-biconic patch cables (from the 8219 and 8220 Cabling Charts)
- The number of optical fiber biconic-to-biconic patch cables of each length (used only to patch connections at distribution panels between two optical fiber cables).

Remember to order a component housing for each 8228 that will not be mounted in a rack and a surface-mounting bracket for each 8218, 8219, and 8220 not installed in a rack.

Spare Network Components

All installations must have at least one spare crossover patch cable, optical fiber BNC-to-biconic patch cable, optical fiber biconic-to-biconic patch cable, and copper wire patch cable of each length and type used in the network. These spares may be used to replace defective cables or to expand the network quickly.

Network Ordering Worksheet

Network Ordering Worksheet

1.	Rack-mounted IBM 8228 Multistation Access Units	<u>33</u>	
2.	Wall-mounted IBM 8228 Multistation Access Units		
	Total Number of IBM 8228 Multistation Access Units (P/N 6091014)		<u>33</u>
3.	Rack-mounted IBM 8218 Copper Repeaters	<u>0</u>	
4.	Wall-mounted IBM 8218 Copper Repeaters	<u>0</u>	
	Total Number of IBM 8218 Copper Repeaters (P/N 6339532)		<u>0</u>
5.	Rack-mounted IBM 8219 Optical Fiber Repeaters	<u>0</u>	
6.	Wall-mounted IBM 8219 Optical Fiber Repeaters	<u>0</u>	
	Total Number of IBM 8219 Optical Fiber Repeaters (P/N 6339535)		<u>0</u>
7.	Rack-mounted IBM 8220 Optical Fiber Converters	<u>8</u>	
8.	Wall-mounted IBM 8220 Optical Fiber Converters	<u>0</u>	
	Total Number of IBM 8220 Optical Fiber Converters		<u>8</u>
9.	IBM 8230 Controlled Access Units		
	Base Units		<u>4</u>
	Lobe Attachment Modules		<u>15</u>
	RJ-45 Lobe Attachment Modules		<u>0</u>
	Optical Fiber Converter Modules		<u>2</u>
	4 Mbps Media Filters		<u>0</u>
10.	8-foot Patch Cables (for lobes)	<u>200</u>	
11.	8-foot Patch Cables (for main ring path)	<u>33</u>	
12.	Spare 8-foot Patch Cables	<u>3</u>	
	Total Number of 8-foot Patch Cables (P/N 8642551)		<u>36</u>
13.	30-foot Patch Cables (for lobes)	<u>0</u>	
14.	30-foot Patch Cables (for main ring path)	<u>0</u>	
15.	Spare 75-foot Patch Cables	<u>0</u>	
	Total Number of 75-foot Patch Cables (P/N 8642552)		<u>0</u>
16.	75-foot Patch Cables (for lobes)	<u>0</u>	
17.	75-foot Patch Cables (for main ring path)	<u>0</u>	
18.	Spare 75-foot Patch Cables	<u>0</u>	
	Total Number of 75-foot Patch Cables (P/N 6339134)		<u>0</u>
19.	150-foot Patch Cables (for lobes)	<u>0</u>	
20.	150-foot Patch Cables (for main ring path)	<u>0</u>	
21.	Spare 150-foot Patch Cables	<u>0</u>	
	Total Number of 150-foot Patch Cables (P/N 6339135)		<u>0</u>
22.	Crossover Patch Cables	<u>4</u>	
23.	Spare Crossover Patch Cables (IBM Specification 6339137)	<u>1</u>	
			<u>5</u>
24.	Optical Fiber BNC-to-Biconic Patch Cables	<u>8</u>	
25.	Spare Optical Fiber BNC-to-Biconic Patch Cables	<u>1</u>	
	Total Number of Optical Fiber BNC-to-Biconic Patch Cables (IBM Specification 6165811)		<u>9</u>

Network Ordering Worksheet

26.	8-foot Optical Fiber Biconic-to-Biconic Patch Cables	<u>0</u>	
27.	Spare 8-foot Optical Fiber Biconic-to-Biconic Patch Cables Total Number of 8-foot Optical Fiber Biconic-to-Biconic Patch Cables (IBM Specification 6165812)	<u>0</u>	<u>0</u>
28.	45-foot Optical Fiber Biconic-to-Biconic Patch Cables	<u>0</u>	
29.	Spare 45-foot Optical Fiber Biconic-to-Biconic Patch Cables Total Number of 45-foot Optical Fiber Biconic-to-Biconic Patch Cables (IBM Specification 6825813)	<u>0</u>	<u>0</u>
30.	Optical Fiber Dual Socket Mounting Clips (IBM Specification 6165847)		<u>10</u>
31.	Component Housings (one for each wall-mounted IBM 8228) (P/N 6091078)		<u>0</u>
32.	Surface Mounting Brackets (one for each wall-mounted IBM 8218, 8219, or 8220) (P/N 6339140)		<u>0</u>
33.	Rack Mounting Assembly (one for each rack-mounted IBM 8218, 8219, or 8220) (P/N 9339139)		<u>6</u>