



## **PC Servers 320 (Type 8640), 520 (Type 8641), and 720 (Type 8642) Parts Listings**

### **PC ServeRAID Adapter Information**

July 1995

This package contains updated information for the PC Servers 320 (Type 8640) 520 (Type 8641), and 720 (Type 8642) computers. This is a supplement to the IBM PC Servers *Hardware Maintenance Manual* (part number 70H0751, form number S30H-2501).

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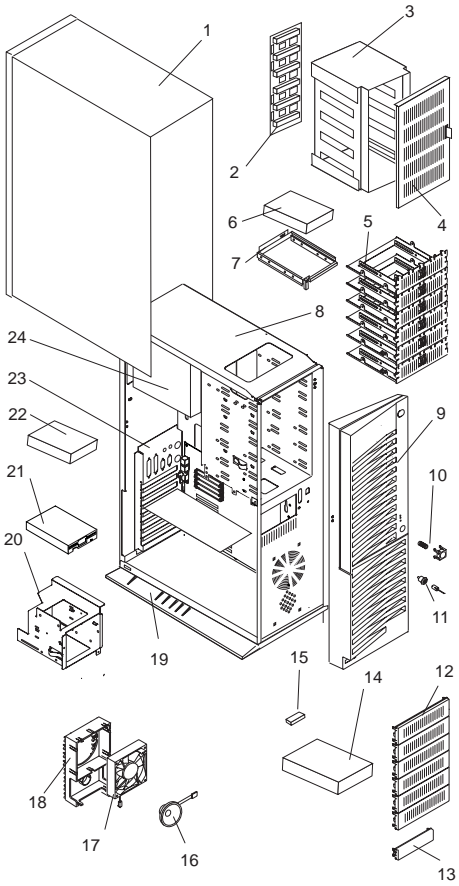
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# Parts (PC Server 320 - Type 8640)



# System

## Note

The model(s) listed for the following FRUs indicates FRUs that the models may contain at the time of shipping. However, other FRUs are supported in each model as options.

Index	System (PC Server 320 - Type 8640)	FRU No.
1	<b>Access Cover</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Z0, 1Y0, 1YT, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	06H8930
2	<b>DASD Hot Swap Backplane</b> (Models 1D0, 1DS, 1Y0, 1YT, 1Z0, 3D0, 3Z0, EE1, EES, MD0, MD2, MDS, MDV, MY0, MYT, MZ0, MZ1, MZ2, MZV)	06H7669
3	<b>Hot Swap Shell</b> (Models 1D0, 1DS, 1Y0, 1YT, 1Z0, 3D0, 3Z0, EE1, EES, MD0, MD2, MDS, MDV, MY0, MYT, MZ0, MZ1, MZ2, MZV)	06H5068
4	<b>Hot Swap Door Assembly</b> (Models 1D0, 1DS, 1Y0, 1YT, 1Z0, 3D0, 3Z0, EE1, EES, MD0, MD2, MDS, MDV, MY0, MYT, MZ0, MZ1, MZ2, MZV)	06H5070
5	<b>3.5-Inch Hard Disk Drive Tray</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 2D0, 2Z0, EE0, EEV, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	06H2652
6	<b>Hard Disk Drive</b> see DASD (PC Server 320 - Type 8640)	
7	<b>DASD Tray - Hot Swap (Wide)</b> (Models 1D0, 1DS, 1Y0, 1YT, 1Z0, 3D0, 3Z0, EE1, EES, MD0, MD2, MDS, MDV, MY0, MYT, MZ0, MZ1, MZ2, MZV)	06H3956
7	<b>DASD Tray - Hot Swap Option (Narrow)</b> (Models 1Y0, 1YT, MD0, MD2, MDS, MDV, MZ0, MZ1, MZ2, MZV)	71G6292
8	<b>Base Frame</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV)	06H8933

<b>Index</b>	<b>System (PC Server 320 - Type 8640)</b>	<b>FRU No.</b>
<b>8</b>	<b>Base Frame</b> (Models MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	<b>06H8934</b>
<b>9</b>	<b>Front Bezel/Door Assembly</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ1, MZ0, MZV, MZ2)	<b>06H8935</b>
<b>10</b>	<b>Keylock with Keys</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	<b>33F8433</b>
<b>11</b>	<b>Keylock with Keys</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	<b>33F8433</b>
<b>12</b>	<b>3.5-Inch Blank Bezel</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MX0, MXT, MY0, MYT, MDS, MZ1, MD0, MDV, MZ0, MZV, MZ2, MD2)	<b>71G0770</b>
<b>13</b>	<b>5.25-Inch Blank Bezel</b> (Models 0D0, 0DV, 0Z0, 0ZV, 0X0, 0XT, 0Y0, 0YT, 1Y0, 1YT, 2D0, 2Z0, EE0, EEV, MD0, MD2, MDV, MX0, MXT, MY0, MYT, MZ0, MZ2, MZV)	<b>71G0771</b>
<b>14</b>	<b>CD-ROM Drive,</b> see DASD (PC Server 320 - Type 8640)	
<b>15</b>	<b>16/8 Bit SCSI Converter</b> (Models 0D0, 0DV, 0X0, 0XT, 0YT, 0Z0, 0ZV, 2D0, 2Z0, EE0, EEV, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MZ0, MZ1, MZ2, MZV)	<b>92F0324</b>
<b>16</b>	<b>Speaker</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE1, EES, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	<b>06H2649</b>
<b>17</b>	<b>Fan Assembly with Connector</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV)	<b>06H2647</b>

<b>Index</b>	<b>System (PC Server 320 - Type 8640)</b>	<b>FRU No.</b>
17	<b>Fan Assembly with Connector</b> (Models MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	96G2112
18	<b>Card Guide</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV)	71G0757
18	<b>Card Guide</b> (Models MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	96G2111
19	<b>Pedestal</b> (Models 0X0, 0XT, 0Y0, 0YT, 1Y0, 1YT, MX0, MXT, MY0, MYT)	96G2412
19	<b>Pedestal</b> (Models 0D0, 0DV, 0Z0, 0ZV, 1D0, 1DS, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MD0, MD2, MDS, MDV, MZ0, MZ1, MZ2, MZV)	07H0516
20	<b>DASD 2-Drive Cage</b> (Models MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	06H8937
20	<b>DASD 3-Drive Cage</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV)	06H8938
21	<b>Diskette Drive</b> see DASD (PC Server 320 - Type 8640)	
22	<b>Hard Disk Drive</b> see DASD (PC Server 320 - Type 8640)	
23	<b>Casting I/O Back Panel</b> (Models MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	96G2107
24	<b>300W Power Supply Assembly with Switch</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	71G0044

<b>System (PC Server 320 - Type 8640)</b>	<b>FRU No.</b>
<b>Battery</b> (Models MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV), see "Battery Notice" on page 461 in your PC Server Hardware Maintenance manual	<b>33F8354</b>
<b>Memory High Rise Card</b> (Models MD0, MD2, MDS, MDV, MZ0, MZ1, MZ2, MZV)	<b>96G3692</b>
<b>Memory High Rise Card</b> (Models MX0, MXT, MY0, MYT)	<b>96G1339</b>
<b>Miscellaneous Parts Kit</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EEV, EE1, EES, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV) <ul style="list-style-type: none"> <li>• 32X5/16-Inch Screws (6 each)</li> <li>• Captive Screws (2 each)</li> <li>• Diskette Drive M3 Screws (2 each)</li> <li>• EMC Ground Contacts (4 each)</li> <li>• EMC I/O Spring</li> <li>• EMC Keyboard/Mouse Clip</li> <li>• Nut 2-56 Screws (2 each)</li> <li>• Nut 4-40 Screws (2 each)</li> <li>• Hard File 6-32 Screws (2 each)</li> <li>• I/O EISA Blank</li> <li>• I/O Micro Channel Blank</li> <li>• Memory Card Standoff</li> <li>• Power Switch Bracket</li> <li>• System Board Edge Support</li> <li>• System Board M3X8 Hex Screws (3 each)</li> <li>• System Board Standoff</li> <li>• Thumb Screw</li> <li>• Video Gasket</li> </ul>	<b>06H8940</b>
<b>Mouse</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MD2, MDS, MX0, MXT, MY0, MYT, MD0, MDV, MZ0, MZ1, MZ2, MZV)	<b>06H4595</b>
<b>PC Server 320 Label</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	<b>06H6004</b>
<b>Power Button with Spring</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	<b>06H2191</b>
<b>Pressing I/O Back Panel</b> (Early models only) (Models MX0, MXT, MY0, MYT)	<b>96G2411</b>



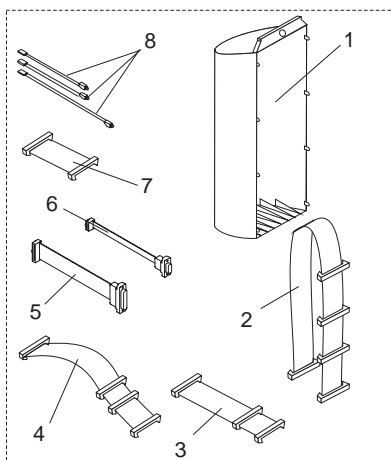
<b>System (PC Server 320 - Type 8640)</b>	<b>FRU No.</b>
<b>Real Time Clock with Battery</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV), see "Battery Notice" on page 461 in your PC Server Hardware Maintenance manual	<b>06H3398</b>
<b>SCSI Fast/Wide Adaptec Card</b> (Models 0D0, 0DV, 0X0, 0XT 0Y0, 0YT, 0Z0, 0ZV, 2D0, 2Z0, EE0, EEV)	<b>06H8574</b>
<b>SCSI Fast/Wide Array Card</b> (Models 1D0, 1DS, 1Y0, 1YT, 1Z0, 3D0, 3Z0, EE1, EES, MDS, MY0, MYT, MZ1)	<b>06H5078</b>
<b>Shadow Box</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 1D0, 1DS, 1Y0, 1YT, 1Z0, 0Z0, 0ZV, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV)	<b>96G2411</b>
<b>SVGA STB Card</b> (Models 0D0, 0DV, 0Z0, 0ZV, 1D0, 1DS, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV)	<b>06H9114</b>
<b>SVGA Card</b> (Models 0X0, 0XT, 0Y0, 0YT, 1Y0, 1YT)	<b>71G0031</b>
<b>System Board (PC Server 320 - Type 8640)</b>	<b>FRU No.</b>
<b>4MB Memory SIMM (Parity)</b> (Models MX0, MXT)	<b>73G3233</b>
<b>8MB Memory SIMM (Parity)</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, MD0, MDS, MDV, MY0, MYT, MZ0, MZ1, MZV)	<b>73G3234</b>
<b>16MB EOS Memory</b> (Models 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES EEV)	<b>11H0634</b>
<b>16MB EOS Memory</b> (Models MZ2, MD2)	<b>11H0646</b>
<b>256K Cache</b> (Models MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	<b>96G2121</b>
<b>512K Cache</b> (Models MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	<b>96G2413</b>
<b>Heat Sink with Clip</b> (Models 0X0, 0XT, 0Y0, 0YT, 1Y0, 1YT)	<b>06H6137</b>
<b>Heat Sink with Clip</b> (Models MX0, MXT, MY0, MYT)	<b>95G9612</b>
<b>P54C 50/75 Processor Chip with Heat Sink</b> (Models 0X0, 0XT, MX0, MXT)	<b>95G9613</b>
<b>P54C 60/90 Processor Chip with Heat Sink</b> (Models 0Y0, 0YT, 1Y0, 1YT)	<b>06H6142</b>
<b>P54C 60/90 Processor Chip with Heat Sink</b> (Models MY0, MYT)	<b>95G9614</b>
<b>P54C 60/90 Processor Chip</b> (Models 0Z0, 0ZV, 1Z0, 2Z0, 3Z0)	<b>75H8846</b>

<b>System Board (PC Server 320 - Type 8640)</b>	<b>FRU No.</b>
<b>P54C 100/66 Processor Chip</b> (Models MZ0, MZ1, MZ2, MZV)	<b>96G2415</b>
<b>P54C 133/66 Processor Chip</b> (Models 0D0, 0DV, 1D0, 1DS, 2D0, 3D0)	<b>07H0570</b>
<b>P54C 133/66 Processor Chip</b> (Models MD0, MD2, MDS, MDV)	<b>96G2423</b>
<b>P54C 166/66 Processor Chip</b> (Models EE0, EE1, EES, EEV)	<b>07H0971</b>
<b>System Board without Memory and Processor</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0)	<b>06H2173</b>
<b>System Board without Memory and Processor</b> (Models EE0, EE1, EES, EEV)	<b>76H0469</b>
<b>System Board with SVGA and SCSI Fast/Wide Adaptec</b> (Models MD0, MD2, MDS, MDV, MZ0, MZ1, MZ2, MZV)	<b>96G3694</b>
<b>System Board with SVGA and SCSI Fast/Wide Adaptec</b> (Models MX0, MXT, MY0, MYT)	<b>96G1340</b>

## **DASD**

<b>Index</b>	<b>(PC Server 320 - Type 8640)</b>	<b>FRU No.</b>
<b>6</b>	<b>1GB Fast Hard Disk Drive</b> (Models 0X0, 0XT, MX0, MXT)	<b>06H6416</b>
<b>6</b>	<b>1GB Fast/Wide Hard Disk Drive</b> (Models 0YT, MY0, MYT)	<b>06H3371</b>
<b>6</b>	<b>2GB Fast/Wide Hard Disk Drive</b> (0DV, 0ZV, 1DS, EEV, EES, MDS, MDV, MZV)	<b>06H8561</b>
<b>14</b>	<b>2X SCSI CD-ROM Drive</b> (Models 0Y0, 0YT, 1Y0, 1YT, MX0, MXT, MY0, MYT)	<b>06H3847</b>
<b>14</b>	<b>4X SCSI CD-ROM Drive</b> (Models 0D0, 0DV, 0X0, 0XT, 0Z0, 0ZV, 1D0, 1DS, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MD0, MD2, MDS, MDV, MZ0, MZ1, MZ2, MZV)	<b>88G4921</b>
<b>21</b>	<b>1.44MB Diskette Drive</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 3D0, 3Z0, 2D0, 2Z0, EE0, EE1, EES, EEV, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	<b>93F2361</b>

# Cables



Index	(PC Server 320 - Type 8640)	FRU No.
1	<b>Cable Cover with Lock</b> (Models 0X0, 0XT, 0Y0, 0YT, 1D0, 1DS, 1Y0, 1YT, 1Z0, 3D0, 3Z0, EE1, EES, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZV, MZ2, MZ1,	06H5072
2	<b>SCSI Fast Hard Disk Drive Cable (4X)</b> (Models 0X0, 0XT, 0Y0, MX0, MXT)	82G3626
3	<b>SCSI Hard Disk Drive Fast Cable (2X)</b> (Models 1D0, 1DS, 1Y0, 1YT, 1Z0, 3D0, 3Z0, EE1, EES, MY0, MYT, MD0, MD2, MDS, MDV, MZ0, MZ1, MZ2, MZV)	06H5065
4	<b>Diskette Drive Cable with Power</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	92F0423
5	<b>Parallel Data Cable</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MD0, MDS, MDV, MD2, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	06H2166

<b>Index</b>	<b>(PC Server 320 - Type 8640)</b>	<b>FRU No.</b>
<b>6</b>	<b>Serial Data Cable</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	<b>06H2165</b>
<b>7</b>	<b>SCSI Fast/Wide Internal/External Cable</b> (Models 1Y0, 1YT, MD0, MD2, MDS, MDV, MZ0, MZ1, MZ2, MZV)	<b>06H6864</b>
<b>8</b>	<b>LED Cable Assembly</b> (Models 0D0, 0DV, 0X0, 0XT, 0Y0, 0YT, 0Z0, 0ZV, 1D0, 1DS, 1Y0, 1YT, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	<b>06H8936</b>
<b>(PC Server 320 - Type 8640)</b>		<b>FRU No.</b>
	<b>C2 Cable Assembly</b> (Models 0X0, 0XT, 0Y0, 0YT, 1D0, 1DS, 1Y0, 1YT, 1Z0, 3D0, 3Z0, EE1, EES, MX0, MXT, MY0, MYT)	<b>06H8767</b>
	<b>DASD Status Cable</b> (Models 1D0, 1DS, 1Y0, 1YT, 1Z0, 3D0, 3Z0, EE1, EES, MDS, MZ1)	<b>06H7766</b>
	<b>Keylock Cable</b> (Models 0X0, 0XT, 0Y0, 0YT, 1D0, 1DS, 1Y0, 1YT, 1Z0, 3D0, 3Z0, EE1, EES)	<b>06H8766</b>
	<b>SCSI Hard Disk Drive Cable Fast/Wide (7X)</b> (Models 0D0, 0DV, 0X0, 0XT, 0YT, 0Z0, 0ZV, 2D0, 2Z0, EE0, EEV, MX0, MXT)	<b>06H6440</b>
	<b>SCSI Short Cable to I/O Casting</b> (Models MD0, MD2, MDS, MDV, MX0, MXT, MY0, MYT, MZ0, MZ1, MZ2, MZV)	<b>96G2102</b>

## Keyboards (101/102 Key)

(PC Server 320 - Type 8640)

FRU No.

Arabic	1391490
Belgium-Dutch	1391414
Belgium-French	1391526
Bulgarian	1399583
Czech	1399570
Danish	1391407
Dutch	1391511
Finnish	1391411
French	1391402
German	1391403
Greek	1399046
Hebrew	1391408
Hungarian	1399581
Iceland	1391495
Italy	1393395
Latvia	1391406
Norwegian	1391409
Polish	1399580
Portuguese	1391410
Romanian	1399582
Russian-Cyrillic	1399579
Serbian-Cyrillic	1399578
Slovak	1399571
Slovenia/Croatia/Bosnia	1393669
South Africa	1396790
Spanish	1391405
Swedish	1391411
Swiss-French	1391412
Swiss-German	1391412
Turkish 179	8125409
Turkish 440	1393286
U.K. English	1391406
U.S. English	06H9743
U.S. English (Models 0D0, 0DV, 0Z0, 0ZV, 1D0, 1DS, 1Z0, 2D0, 2Z0, 3D0, 3Z0, EE0, EE1, EES, EEV, MD0, MD2, MDV, MDS, MZ0, MZ1, MZ2, MZV)	75H9505
U.S. English (Models 0X0, 0XT, 0Y0, 0YT, 1Y0, 1YT, MX0, MXT, MY0, MYT)	71G4646
U.S. English (E/ME/A use only)	1396790

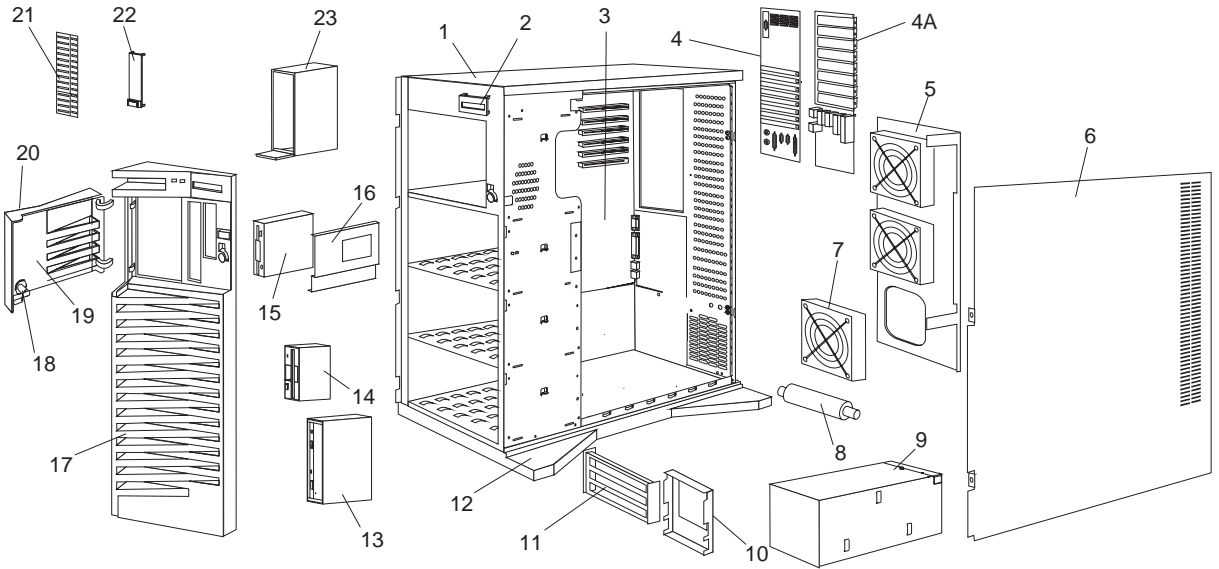
## Power Cords

(PC Server 320 - Type 8640)

FRU No.

Arabic	14F0033
Belgium	1339520
Bulgaria	1339520
Czech Republic	1339520
Denmark	13F9997
Finland	1339520
France	1339520
Germany	1339520
Hungary	1339520
Israel	14F0087
Italy	14F0069
Latvia	1339520
Netherlands	1339520
Norway	1339520
Poland	1339520
Portugal	1339520
Serbia	1339520
Slovakia	1339520
South Africa	14F0015
Spain	1339520
Switzerland	1339520
Switzerland (French/German)	14F0051
U.S. English	62X1045
U.K./Ireland	14F0033
Yugoslavia	1339520

Parts (PC Server 520 - Type 8641)



# System

## Note

The model(s) listed for the following FRUs indicates FRUs that the models may contain at the time of shipping. However, other FRUs are supported in each model as options.

Index	System (PC Server 520 - Type 8641)	FRU No.
1	<b>Base Frame</b>	06H8028
1	<b>Base Frame (4X CD-ROM)</b> (Models ED0, ED1, EDL, EE0, EE1, EEE, MD0, MDL)	75H8099
2	<b>LED Panel Assembly</b>	06H8031
3	<b>System Board with 512K Cache, without SCSI, SVGA</b> (Models ED1, EDE, EDL, EZ1, EZS, EZE, EZL, ED0, EDV, EZ0, EZV)	06H9989
3	<b>System Board with 512K Cache, without SVGA, SCSI</b> (Models ED0, ED1, EDL, EE0, EE1, EEE)	76H2266
3	<b>System Board with SVGA and SCSI, without Cache</b> (Models MDE, MDL, MZS, MZE, MZL, MD0, MDV, MZO, MZV)	96G2648
4	<b>Die Cast Assembly</b> (Models ED0, ED1, EDE, EDL, EDV, EE0, EE1, EEE, EZ0, EZ1, EZE, EZL, EZS, EZV)	06H9360
4A	<b>Die Cast Assembly</b> (Models MDE, MDL, MZS, MZE, MZL, MD0, MDL, MDV, MZO, MZV)	06H9361
5	<b>Fan Mounting Support</b>	82G3618
5	<b>Fan Mounting Support</b> (Models ED0, ED1, EDL, EE0, EE1, EEE, MD0, MDL)	75H7914
6	<b>Right Side Door</b>	82G3594
6	<b>Right Side Door</b> (Models ED0, ED1, EDL, EE0, EE1, EEE, MD0, MDL)	75H7911
7	<b>Fan Assembly</b>	06H3407
8	<b>Pedestal Wheel with Axle</b>	82G3609
9	<b>434W Power Supply Assembly</b>	06H3596
10	<b>8-Card Guide</b>	06H8057
11	<b>4-Card Guide Support</b> (Models MDE, MDL, MZS, MZE, MZL, MD0, MDL, MDV, MZO, MZV)	82G3603
12	<b>Pedestal</b>	82G3608
13	<b>CD-ROM Drive</b> see"DASD" on page 16 .	
14	<b>Diskette Drive</b> see"DASD" on page 16 .	



<b>Index</b>	<b>System (PC Server 520 - Type 8641)</b>	<b>FRU No.</b>
15	<b>Hard Disk Drive</b> see "DASD" on page 16 .	
16	<b>DASD Tray Assembly - Hot Swap with Cable</b> (Models ED0, ED1, EDE, EDL, EDV, EE0, EEE, MD0, MDE, MDL, MDV)	06H8631
16	<b>DASD Tray Assembly - Hot Swap Wide</b> (Models EZ1, EZS, EZE, EZL, EZ0, EZV, MZS, MZE, MZL, MZO, MZV)	06H3956
17	<b>Front Bezel with Shield</b>	06H8973
17	<b>Front Bezel with Shield (4X CD-ROM)</b> (Models ED0, ED1, EDL, EE0, EE1, EEE, MD0, MDL)	07H0209
18	<b>Keylock with Key</b>	82G3606
18	<b>Keylock with Keys and Pawl</b> (Models ED0, ED1, EDL, EE0, EE1, EEE, MD0, MDL)	07H0196
19	<b>DASD Door</b>	82G3596
19	<b>DASD Door</b> (Models ED0, ED1, EDL, EE0, EE1, EEE, MD0, MDL)	07H0212
20	<b>IBM Logo (restricted)</b>	82G3601
21	<b>5.25-Inch Hard Disk Drive Bezel with Spacer</b>	06H8684
22	<b>Control Panel Bezel</b>	06H3595
23	<b>CD Storage Tray</b>	06H5060
	<b>System (PC Server 520 - Type 8641)</b>	<b>FRU No.</b>
	<b>16/8 Bit SCSI Converter</b>	92F0324
	<b>512K Cache</b> (Models MD0, MDE, MDL, MDV, MZS, MZE, MZL, MZO, MZV)	96G2413
	<b>16MB EOS Memory SIMM</b> (Models ED1, ED0, ED1, EDE, EDL, EDV, EZ1, EZS, EZE, EZL, EZ0, EZV)	11H0634
	<b>16MB EOS Memory SIMM</b> (Models MD0, MDE, MDL, MZS, MZE, MZL, MDV, MZO, MZV)	11H0646
	<b>32MB EOS MEMORY SIMM</b> (Models EE0, EE1, EEE)	11H0637
	<b>220W Power Supply Assembly</b>	06H3237
	<b>Battery</b> (Models MD0, MDE, MDL, MZS, MZE, MZL, MD0, MDV, MZO, MZV), see "Battery Notice" on page 461 in your PC Server Hardware Maintenance manual	33F8354
	<b>DASD Hot Swap Backplane Assembly</b> (Models ED0, ED1, EDE, EDL, EDV, EE0, EE1, EEE, MDE, MDL, MD0, MDL, MDV)	76H2671

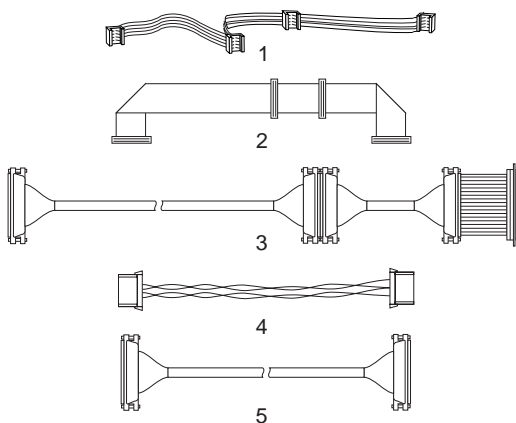
<b>System (PC Server 520 - Type 8641)</b>	<b>FRU No.</b>
<b>DASD Hot Swap Backplane Assembly</b> (Models EZ1, EZS, EZE, EZL, EZ0, EZV, MZS, MZE, MZL, MZO, MZV)	<b>06H8388</b>
<b>DASD Mounting Plate</b>	<b>82G3602</b>
<b>Display Panel Support</b> (Models ED0, ED1, EDL, EE0, EE1, EEE, MD0, MDL)	<b>07H0201</b>
<b>Ethernet PCI Card</b> (Models EDL, EZL, MDL, MZL)	<b>82G3602</b>
<b>Ethernet PCI Card</b> (Models EDL, MDL)	<b>06H8575</b>
<b>Hinges (2 each)</b>	<b>82G3600</b>
<b>Hot Swap Cam Spring, Shaft and Knob</b>	<b>06H5059</b>
<b>Keyboard with Cable,</b> see“Keyboards (101/102 Key)” on page 18 .	
<b>LED/Speaker, Power Switch Cable Assembly</b>	<b>06H8037</b>
<b>Lock Latch Assembly with Rod</b> (Models ED0, ED1, EDL, EE0, EE1, EEE, MD0, MDL)	<b>07H0195</b>
<b>Memory High Rise Card</b> (Models MD0, MDE, MDL, MDV)	<b>96G3692</b>
<b>Memory High Rise Card</b> (Models MZS, MZE, MZL, MZO, MZV)	<b>96G1339</b>
<b>Miscellaneous Parts Kit</b>	<b>82G3611</b>
<ul style="list-style-type: none"> <li>• C2 Spring</li> <li>• EMI Ground Clips (4 each)</li> <li>• Lock Pawl</li> <li>• Screws (4 each)</li> <li>• System Board Mounting Boss (2 each)</li> </ul>	
<b>Mouse</b>	<b>06H4595</b>
<b>P54C 66/100MHz Processor Chip with Heat Sink</b> (Models EZ1, EZS, EZE, EZL, EZ0, EZV)	<b>75H8846</b>
<b>P54C 66/100MHz Processor Chip with Heat Sink</b> (Models MZS, MZE, MZL, MZO, MZV)	<b>96G2415</b>
<b>P54C 66/100MHz Processor Chip with Heat Sink</b>	<b>06H6063</b>
<b>P54C 66/133MHz Processor Chip</b> (Models MDE, MDL, MD0, MDV)	<b>06H9492</b>
<b>P54C 66/133MHz Processor Chip with Heat Sink</b> (Models ED0, ED1, EDE, EDL, EDV)	<b>07H0570</b>
<b>P54C 166/66MHz Processor Chip with Heat Sink</b> (Models EE0, EE1, EEE)	<b>76H0657</b>
<b>PC ServeRAID Adapter</b> (Models ED1, EDL, EE1, EEE, MDL)	<b>06H9334</b>
<b>Power Cord,</b> see“Power Cords” on page 19	
<b>Power Supply Adapter Board</b>	<b>06H8977</b>

<b>System (PC Server 520 - Type 8641)</b>	<b>FRU No.</b>
<b>Real-Time Clock with Battery</b> (Models ED0, ED1, EDE, EDL, EE0, EE1, EEE, EZ1, EZS, EZE, EZL, EDV, EZ0, EZV), see "Battery Notice" on page 461 in your PC Server Hardware Maintenance manual	<b>06H3398</b>
<b>SCSI-2 Hard File Card</b> (Models ED1, EDE, EDL)	<b>06H5078</b>
<b>SCSI-2 RAID PCI Card</b> (Models EZ1, EZS, EZE, EZL)	<b>06H5078</b>
<b>SCSI Fast/Wide Card</b> (Models ED0, EDV, EE0, EZ0, EZV)	<b>06H8574</b>
<b>Speaker with Bracket</b>	<b>33F8444</b>
<b>SVGA Card</b> (Models ED0, ED1, EDE, EDL, ED0, EDV, EE0, EE1, EEE)	<b>06H9114</b>
<b>SVGA Card</b> (Models EZ1, EZS, EZE, EZL, EZ0, EZV)	<b>71G0031</b>

## **DASD**

<b>Index</b>	<b>(PC Server 520 - Type 8641)</b>	<b>FRU No.</b>
<b>13</b>	<b>4X CD-ROM Drive</b>	<b>88G4921</b>
<b>14</b>	<b>1.44MB Diskette Drive</b>	<b>93F2361</b>
<b>15</b>	<b>2GB Hard Disk Drive</b>	<b>06H3372</b>

## Cables



Index	(PC Server 520 - Type 8641)	FRU No.
1	<b>System Status Cable 1X4</b>	<b>06H3404</b>
2	<b>Diskette Drive Signal Cable</b>	<b>06H9345</b>
	<b>Diskette Drive Power Cable</b>	<b>06H8982</b>
3	<b>SCSI-Fast/Wide Cable 1X</b>	<b>06H6876</b>
3	<b>SCSI-Fast/Wide Cable 2X</b>	<b>06H3751</b>
3	<b>SCSI-Fast/Wide Cable 3X</b>	<b>06H6675</b>
	(Models ED0, EDV, MD0, MDV)	
3	<b>SCSI-Fast/Wide Cable 4X</b>	<b>06H6661</b>
	(Models ED1, EDE, EDL, MDE, MDL)	
4	<b>Hard Disk Drive Power Cable 1X</b>	<b>82G3610</b>
5	<b>SCSI Fast/Wide Flex Cable 1X</b>	<b>06H6145</b>

Cables (PC Server 520 - Type 8641)	FRU No.
<b>DASD Status Cable</b>	<b>06H9343</b>
(Models ED0, ED1, EDL, EE0, EE1, EEE, MD0, MDL)	
<b>C2 Cable</b>	<b>82G3612</b>
(Models MDE, MDL, MD0, MDV)	
<b>C2 Cable</b>	<b>76H0508</b>
(Models MD0, MDL)	
<b>C2 Cable</b>	<b>06H8059</b>
(Models MZS, MZE, MZL, MZ0, MZV)	
<b>Parallel Data Cable</b>	<b>06H2166</b>
(Models ED0, ED1, EDE, EDL, EE0, EE1, EEE, EZ1, EZS, EZE, EZL, EDV, EZ0, EZV)	
<b>POS ID Select Cable (Narrow)</b>	<b>06H3592</b>
<b>SCSI Fast/Wide ID Select Cable</b>	<b>06H3957</b>
<b>Serial Data Cable 2X</b>	<b>06H2165</b>
(Models ED0, ED1, EDE, EDL, EDV, EE0, EE1, EEE, EZ1, EZS, EZE, EZL, EZ0, EZV)	
<b>SCSI PT-PT Cable 2X</b>	<b>06H9312</b>
(Models ED0, ED1, EDL, EE0, EE1, EEE, MD0, MDL)	

## Keyboards (101/102 Key)

(PC Server 520 - Type 8641)

FRU No.

Arabic	1391490
Belgium-Dutch	1391414
Belgium-French	1391526
Bulgarian	1399583
Czech	1399570
Danish	1391407
Dutch	1391511
Finnish	1391411
French	1391402
German	1391403
Greek	1399046
Hebrew	1391408
Hungarian	1399581
Iceland	1391495
Italy	1393395
Latvia	1391406
Norwegian	1391409
Polish	1399580
Portuguese	1391410
Romanian	1399582
Russian-Cyrillic	1399579
Serbian-Cyrillic	1399578
Slovak	1399571
Slovenia/Croatia/Bosnia	1393669
South Africa	1396790
Spanish	1391405
Swedish	1391411
Swiss-French	1391412
Swiss-German	1391412
Turkish 179	8125409
Turkish 440	1393286
U.K. English	1391406
U.S. English	06H9743
U.S. English (Models ED0, ED1, EDL, EE0, EE1, EEE, MD0, MDL)	75H9505
U.S. English (E/ME/A use only)	1396790

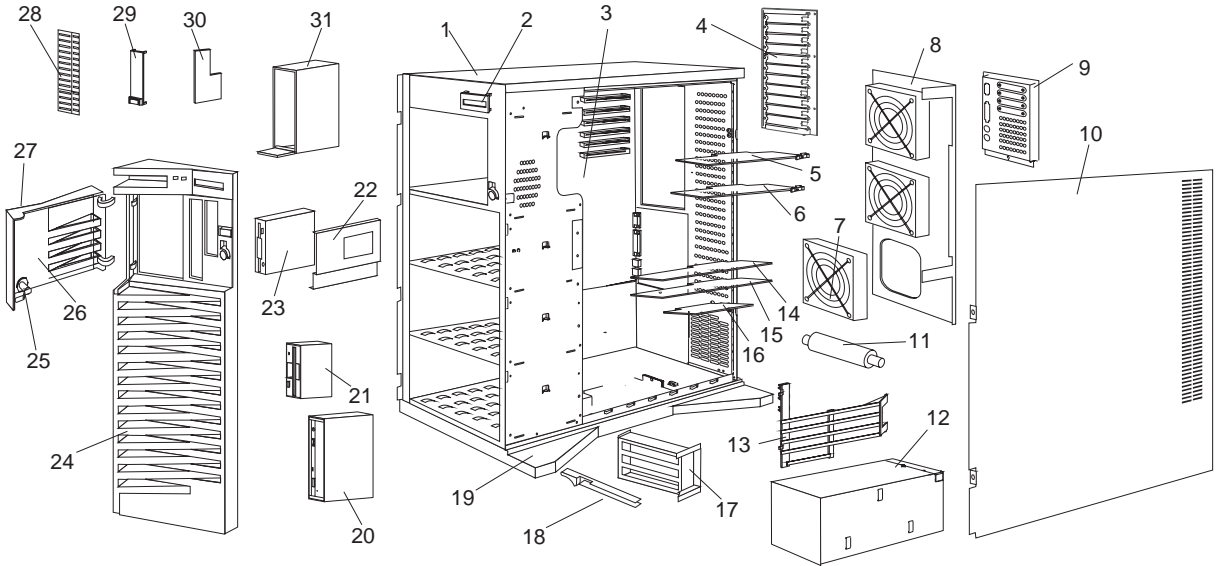
## Power Cords

(PC Server 520 - Type 8641)

FRU No.

Arabic	14F0033
Belgium	1339520
Bulgaria	1339520
Czech Republic	1339520
Denmark	13F9997
Finland	1339520
France	1339520
Germany	1339520
Hungary	1339520
Israel	14F0087
Italy	14F0069
Latvia	1339520
Netherlands	1339520
Norway	1339520
Poland	1339520
Portugal	1339520
Serbia	1339520
Slovakia	1339520
South Africa	14F0015
Spain	1339520
Switzerland	1339520
Switzerland (French/German)	14F0051
U.S. English	62X1045
U.K./Ireland	14F0033
Yugoslavia	1339520

# Parts (PC Server 720 - Type 8642)



# System

## Note

The model(s) listed for the following FRUs indicates FRUs that the models may contain at the time of shipping. However, other FRUs are supported in each model as options.

Index	System (PC Server 720 - Type 8642)	FRU No.
1	<b>Base Frame (2X CD-ROM)</b> (Models 0Z0, 1Z0, 2ZS, 4ZS)	82G3593
1	<b>Base Frame (4X CD-ROM)</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H8685
2	<b>Information Display Assembly</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	82G3614
3	<b>System Board without Memory and Processor</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H1810
4	<b>I/O Panel Die Cast</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H3573
5	<b>SCSI Fast/Wide Card</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0)	06H8574
6	<b>SCSI-2 Fast/Wide RAID Adapter</b> (Models 1Z0, 2ZS, 2DS, 2E1, 4ZS)	06H3059
7	<b>Fan</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	82G3616
8	<b>Fan Mounting Support</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	82G3618
9	<b>I/O Flex Plate</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H3574
10	<b>Right Side Door</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	82G3594
11	<b>Pedestal Wheel with Axle</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	82G3609
12	<b>470W Power Supply Assembly</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H3589
13	<b>Processor Card Support</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H8683
14	<b>PCI Bridge Card</b> (Models 0Z0, 1Z0, 2ZS & 4ZS)	71G0694

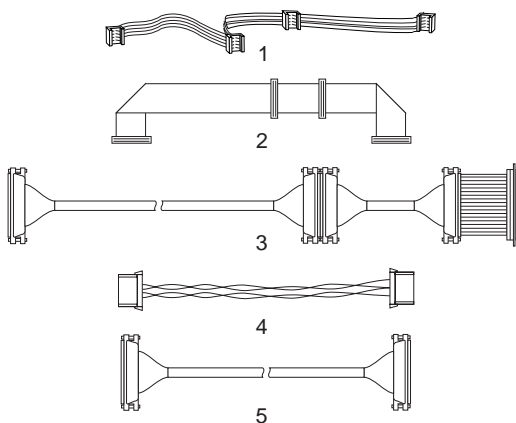


<b>Index</b>	<b>System (PC Server 720 - Type 8642)</b>	<b>FRU No.</b>
15	<b>512MB Memory Board</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	71G0696
16	<b>P54C-100/66MHz Processor Card</b> (Models 0Z0, 1Z0, 2ZS, 4ZS)	71G0692
16	<b>P54C-133MHz Processor Card</b> (Model 0DN)	75H9688
16	<b>P54C-133MHz Processor card</b> (Models 0D0, 2DS)	75H9686
16	<b>P54C-166MHz Processor Card</b> (Models 0EN, 0E1, 2E1)	75H9690
17	<b>3 Card Guide Support</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H8524
	<b>4 Card Guide Support</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H8523
18	<b>Card Guide</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	82G3604
	<b>Adjustable Card Guide Arm</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H8525
19	<b>Pedestal</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	82G3608
20	<b>Slim Line CD-ROM Drive (2X)</b> (Models 0Z0, 1Z0, 2ZS, 4ZS)	06H2150
20	<b>CD-ROM Drive (4X)</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	88G4921
21	<b>2.88MB Diskette Drive</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	82G1888
22	<b>DASD Tray Assembly - Hot Swap (Wide)</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H3956
23	<b>2GB Hard Disk Drive</b> (Models 2DS, 2E1, 2ZS, 4ZS)	06H3372
24	<b>Front Bezel with Shield (2X CD-ROM)</b> (Models 0Z0, 1Z0, 2ZS & 4ZS)	06H7874
24	<b>Front Bezel with Shield (4X CD-ROM)</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H8686
25	<b>Keylock with Keys</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	82G3606
26	<b>DASD Door</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	82G3596

<b>Index</b>	<b>System (PC Server 720 - Type 8642)</b>	<b>FRU No.</b>
<b>27</b>	<b>IBM Logo (Restricted)</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>82G3601</b>
<b>28</b>	<b>5.25-Inch Drive Bezel with Spacer (for 2X CD-ROM Drive)</b> (Models 0Z0, 1Z0, 2ZS, 4ZS)	<b>82G3599</b>
<b>28</b>	<b>5.25-Inch Drive Bezel with Spacer (for 4X CD-ROM Drive)</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>06H8684</b>
<b>29</b>	<b>Control Panel Bezel</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>82G3607</b>
<b>30</b>	<b>Control Panel Card Assembly</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>06H7097</b>
<b>31</b>	<b>CD Storage Tray</b> (Models 0D0, 0DN, 0EN, 0E1, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>06H5060</b>
	<b>System (PC Server 720 - Type 8642)</b>	<b>FRU No.</b>
	<b>4mm DAT Autoloader</b>	<b>06H7541</b>
	<b>8MEG MEMORY ECC (X36) SIMM</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>06H7760</b>
	<b>16MB ECC Memory SIMM</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2DS, 2E1, 2ZS, 4ZS)	<b>06H7761</b>
	<b>32MB ECC Memory SIMM</b> (Models 0D0, 0DN, 0EN, 0E1, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>06H7762</b>
	<b>220W Power Supply Assembly</b> (Models 0Z0, 1Z0, 2ZS, 4ZS)	<b>06H3237</b>
	<b>C2 Cable Cover</b> (Models 0Z0, 1Z0, 2ZS, 4ZS)	<b>71G6290</b>
	<b>Cable Cover Thumbscrew</b> (Models 0Z0, 1Z0, 2ZS, 4ZS)	<b>61G3842</b>
	<b>DASD Hot Swap Backplane Assembly</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>06H8388</b>
	<b>DASD Mounting Plate</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>82G3602</b>
	<b>DASD Tray Assembly - Hot Swap (Narrow)</b> (Models 0Z0, 1Z0, 2ZS & 4ZS)	<b>71G6292</b>
	<b>Display Panel Support</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>06H7961</b>
	<b>Ethernet PeerMaster Quad-BT Adapter (with coax cable connector)</b>	<b>06H4220</b>
	<b>Ethernet PeerMaster Quad-B2 Adapter (with twisted-pair cable connector)</b>	<b>06H6042</b>

<b>System (PC Server 720 - Type 8642)</b>	<b>FRU No.</b>
<b>Hinges with Screws</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>82G3600</b>
<b>Hot Swap Cam Spring, Shaft, and Knob</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>06H5059</b>
<b>Information Display Cable</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>06H8679</b>
<b>Miscellaneous Parts Kit</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>82G3611</b>
<ul style="list-style-type: none"> <li>• <b>C2 Spring (1)</b></li> <li>• <b>EMI Ground Clips (4)</b></li> <li>• <b>Hinge Screws (2)</b></li> <li>• <b>Lock Pawl (1)</b></li> <li>• <b>System Board Mounting Boss (2)</b></li> <li>• <b>Screws (4)</b></li> </ul>	
<b>Mouse</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>06H4595</b>
<b>PCI Bridge Card</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR)	<b>75H9149</b>
<b>Power Supply Assembly</b> (Model 0FR)	<b>06H9140</b>
<b>Real-Time Clock with Battery</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS), see "Battery Notice" on page 461 in your PC Server Hardware Maintenance manual	<b>82G3620</b>
<b>Rubber Dome Switch Pad</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>06H7873</b>
<b>Speaker with Bracket</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	<b>33F8444</b>

## Cables



Index	(PC Server 720 - Type 8642)	FRU No.
1	<b>System Status Cable (1X4)</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	82G3617
2	<b>Diskette Drive Signal with Power (3X)</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H3405
3	<b>SCSI Fast/Wide Cable (3X)</b> (Models 1Z0, 2DS, 2E1, 2ZS, 4ZS)	06H6661
3	<b>SCSI Fast/Wide Cable (3X)</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0)	06H6675
4	<b>Hard Disk Drive Power Cable (1X)</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	82G3610
5	<b>SCSI Fast/Wide Flex Cable (1X)</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H6145
<b>(PC Server 720 - Type 8642)</b>		<b>FRU No.</b>
	<b>C2 Cable with Switch</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	82G3612
	<b>Dual Serial Cable Assembly</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H7868
	<b>Fan Cable Assembly</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H7870
	<b>RAID Controller to Blackplane Cable</b>	83G3613
	<b>SCSI Backplane to CD-ROM Terminator Cable</b>	06H3751
	<b>SCSI Fast/Wide ID Select Cable</b> (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR, 0Z0, 1Z0, 2ZS, 4ZS)	06H3957
	<b>SCSI PCI Option Card to Backplane Cable</b> (Models 0Z0, 1Z0, 2ZS, 4ZS)	06H6876

## Keyboards (101/102 Key)

(PC Server 720 - Type 8642)

FRU No.

Arabic	1391490
Belgium-Dutch	1391414
Belgium-French	1391526
Bulgarian	1399583
Czech	1399570
Danish	1391407
Dutch	1391511
Finnish	1391411
French	1391402
German	1391403
Greek	1399046
Hebrew	1391408
Hungarian	1399581
Iceland	1391495
Italy	1393395
Latvia	1391406
Norwegian	1391409
Polish	1399580
Portuguese	1391410
Romanian	1399582
Russian-Cyrillic	1399579
Serbian-Cyrillic	1399578
Slovak	1399571
Slovenia/Croatia/Bosnia	1393669
South Africa	1396790
Spanish	1391405
Swedish	1391411
Swiss-French	1391412
Swiss-German	1391412
Turkish 179	8125409
Turkish 440	1393286
U.K. English	1391406
U.S. English (Models 0D0, 0DN, 0E1, 0EN, 0F0, 0FR)	75H9505
U.S. English (Models 0Z0, 1Z0, 2ZS, 4ZS)	71G4646
U.S. English (E/ME/A use only)	1396790

## Power Cords

(PC Server 720 - Type 8642)

FRU No.

Arabic	14F0033
Belgium	1339520
Bulgaria	1339520
Czech Republic	1339520
Denmark	13F9997
Finland	1339520
France	1339520
Germany	1339520
Hungary	1339520
Israel	14F0087
Italy	14F0069
Latvia	1339520
Netherlands	1339520
Norway	1339520
Poland	1339520
Portugal	1339520
Serbia	1339520
Slovakia	1339520
South Africa	14F0015
Spain	1339520
Switzerland	1339520
Switzerland (French/German)	14F0051
U.S. English	62X1045
U.K./Ireland	14F0033
Yugoslavia	1339520

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## PC ServeRAID Adapter

The following configuration information and procedures apply only to servers that have an PC ServeRAID adapter installed.

### Note

You can use the Administration and Monitoring program or the ServeRAID configuration program for the following tasks. By using the Administration and Monitoring program from the active operating system desktop, you do not have to restart the server. Refer to the README file on the Administration and Monitoring program for instructions for the operating system.

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## Device Drivers

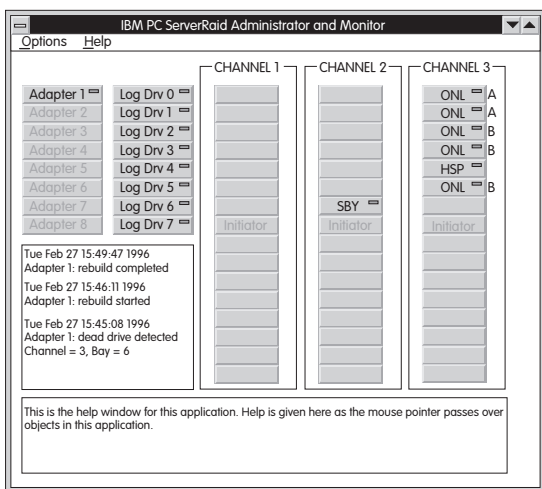
The ServeRAID adapter requires the installation of device drivers. See the README file on the Device Driver/Administration and Monitoring diskette for detailed instructions.

If the operating system is installed from the ServerGuide CD, the device drivers will be installed automatically. However, if the operating system is installed from diskettes, the device drivers must be installed. See the README file on the Device Driver/Administration and Monitoring diskette for installation instructions.

## Administration and Monitoring Utilities

The Administration and Monitoring program contains RAID monitoring utility programs for several operating systems that the ServeRAID adapter supports. You can monitor the ServeRAID configuration program in the local and remote systems by using these programs.

The following is an example of an Administration and Monitoring program screen.



## Monitoring the Adapter Status in a Local System:

The Device Driver/Administration Monitoring Program diskette provides monitoring programs that you can use to perform disk-array maintenance tasks. Because the monitoring programs reside on top of the operating system, you do not need to restart the server. Instead, you can perform tasks such as the following from the active operating system desktop:

- Select the adapter that you want to monitor.

- View information about drives connected to the adapter, and change the drive state.
- Reassign a drive to replace a defunct drive.

Some operating systems provide additional features, such as adding and deleting a logical drive. Refer to the README file on the Administration and Monitoring program for specific information and installation instructions.

## **Monitoring Adapter Status from a Remote System:**

The ServeRAID Administration and Monitoring programs support the Client/Server environment using TCP/IP on a variety of platforms. The server programs run on the system containing a ServeRAID adapter and is supported on a number of operating systems. See the README file on the Administration and Monitoring program for more information. The Client program runs in various Windows environments:

- Windows NT Server Version 3.51
- Windows NT Workstation Version 3.51
- Windows 95

The Client program includes many of the functions contained in the ServeRAID configuration program. Because it resides on top of the operating system, you do not need to restart the server to add and remove capacity dynamically when creating or deleting an array. You can start the Administration and Monitoring program from the active operating system desktop.

This monitoring program allows you to:

- View the ServeRAID configuration and associated devices
- Reassign a drive to replace a defunct drive
- Create a logical drive
- Create an array
- Delete an array

In addition, in an array that contains only one logical drive, and the total number of logical drives in all arrays is less than 7, you can change the logical drive RAID level from level 0 to level 5 (or level 5 to level 0).

See the README file on the Administration and Monitoring program for instructions on installing and using this monitoring utility.

## **RAID Technology**

RAID is the technology of grouping several hard disk drives in a server into an *array* that can be defined as a single logical drive. This *logical* drive then appears to the operating system as a single *physical* drive. This grouping

technique greatly enhances logical-drive capacity and performance. In addition, if one of the hard-disk drives fails (becomes defunct) the system continues to run, with no operator intervention required, at reduced performance. You can replace the defunct drive without powering off the server (*hot-swap*). For more information about hot-swappable hard disk drives, refer to the internal drive installation information (Internal Drives, Internal Drive Bays, or Installing internal Drives) in your *IBM PC Server Hardware Maintenance Manual (form number S30H-2501-01)*

## Hard Disk Drive Capacities:

The drives in the disk array can be of different capacities (for example, 1 GB or 2 GB); however, they are treated in the disk array configuration as if they all have the capacity of the smallest disk drive. Therefore, if you have four drives of 1 GB, 1 GB, 1 GB, and 2 GB grouped in one disk array, the total capacity of the array is 1 GB times 4, or 4 GB (instead of the 5 GB physically available).

### Notes

1. The total capacity of the array without protection would be 4 GB. With RAID level 5, the usable data capacity would be 3 GB.
2. When referring to hard-disk-drive capacity, GB means 1 000 000 000 bytes; total user-accessible capacity may vary depending on operating environment.

## Additional Storage Capacity:

With the Administration and Monitoring program Remote Monitor, you can dynamically add capacity to the server by defining additional arrays and logical drives (when the operating system supports this). When you use the Remote Monitor, you do not have to restart the server to create an array.

When hard disk drives are added to the server, a new disk array must be configured before the drives can be used. Reconfigure the existing disk array to include the capacity offered with the added drives, or group the added drives into their own array (see "Creating a Disk Array" on page 38).

### Note

An array can be created with only one drive.

## The ServeRAID Configuration Program Screens:

Use the IBM ServeRAID configuration program on the Array Configuration (also called the ServeRAID Configuration) diskette to configure or view the disk array. The following example screen is a compilation of many of the IBM ServeRAID Controller Disk Array Configuration (also called the ServeRAID configuration program) screens. The list that follows example explains the numbered areas of the example.

IBM PC ServeRAID Adapter Disk Array Configuration Ver. 1.XX  
Adapter Number: 1 Bus Number: 0 Host ID - Null Config

Enter Size of Logical Drive, (MB): 3840

Create/Delete Array

1. Help
2. Delete Disk Array
3. Create Disk Array
4. Define Logical Drive
5. Delete Logical Drive

Array ID	Size (MB)	Log Drv (MB)	RAID Level	Date Created	Status	WRT Pol
A	5760	A0 1500	RAID-5	03/24/94	OKY	WT
B	5760	A1 1500	RAID-0	03/24/94	OKY	WT
C	3840	A2 1005	RAID-1	03/24/94	OKY	WT
D	5760	B0 1500	RAID-5	03/24/94	OFL	WT
		B1 3510	RAID-0	03/24/94	OFL	WT
		C0 1500	RAID-0	03/24/94	OKY	WB
		C1 1170	RAID-1	03/24/94	OKY	WT

Ch 1 Array Bay: 1 ONL A, 2 ONL A, 3 ONL A, 4 ONL A, 5 ONL A, 6 ONL A

Ch 2 Array Bay: 1 ONL B, 2 ONL B, 3 ONL B, 4 ONL B, 5 DDD B, 6 HSP B, 7 DHS B, 8 ONL D, 9 ONL D, 10 ONL D, 11 ONL D, 12 ONL D, 13 ONL D, 14 ONL D, 15 ONL D

Ch 3 Array Bay: 1 ONL C, 2 ONL C, 3 ONL C, 4 ONL C, 5 ONL C, 6 ONL C, 7 CDR C, 8 SHS C, 9 TAP C, 10 ONL C, 11 ONL C, 12 ONL C, 13 ONL C, 14 ONL C, 15 ONL C

Enter a value greater than 2 and less than the default value shown or 32X1024 whichever is lesser, and press Enter. ESC to quit.

1. This area displays pop-ups that apply to the current menu. For example, a pop-up allows you to select the logical drive size by entering the size in megabytes; or, to accept the default value shown. Another pop-up allows you to select the RAID level you want to assign to the logical drive you are defining. When you need to confirm an action, the Confirm pop-up appears in this area.
2. You can select any of the choices that appear on the menus.
3. The Bay/Array selection list shows 15 bays for each of the adapter's three channels. For each bay that contains a drive, the list indicates the state of the physical drive and the array in which the drive is grouped. For example, in the illustration, the drive in Channel 2, Bay 1, has a drive status of **ONL** and is a part of Array B. Selections are made from this list to determine which bays (hard disk drives) are in the arrays.

## Notes

1. The Bay/Array area on the screen does not reflect the physical configuration of the server. In the server, the default numbering for the hard disk drive bays in each bank is 1 through 6 (from left to right).
2. The IDs for the hot-swappable drives are set by the backplanes. This allows you to define the IDs as low (0 to 5) or high (8 to 13). Refer to the backplane information in the *PC Server Hardware Maintenance Manual* for the system you are servicing.
3. One channel on the ServeRAID adapter can support two daisy-chained banks of bays. The SCSI ID jumpers on the backplanes must be set to avoid SCSI ID conflicts.
4. The Bay Number corresponds to the SCSI ID of the device plus 1. When the SCSI IDs are set to high, the hard disk drive with SCSI ID 8 is installed in the leftmost bay; its status displays in Bay Number 9.

4. The Array list indicates the array ID and the size (in megabytes) of the array. When a drive is being rebuilt, this area, along with the Logical Drive list area, shows the progression of the rebuilding process.
5. The Logical Drive list identifies the logical drive (for example, A1), including its size, the RAID level, date of creation, and its write policy.

The status of the logical drive also is shown.

- |            |  |
|------------|--|
| <b>OKY</b> | No problem conditions are associated with the drive.   |
| <b>CRT</b> | Replace the defunct drive and do a rebuild operation. (You will have received a message telling you what has happened to the drive.) |
| <b>OFL</b> | The logical drive is irrecoverable; the data in that drive is lost.  |

When a drive is being rebuilt, this area, along with the Array list area, shows the progression of the rebuilding process.

During an initialization process, the Write Policy area displays the percent initialized; during a synchronization process, it displays the percent synchronized.

6. The information area tells you the action you can perform on this screen or pop-up.

## Starting the ServeRAID Configuration Program

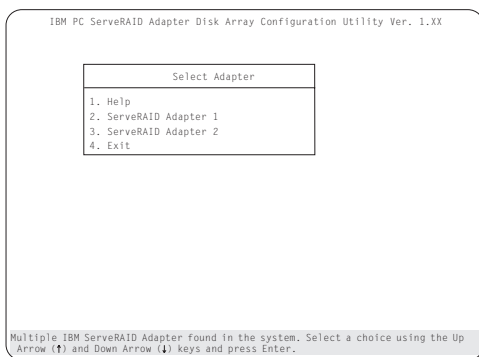
To start the ServeRAID configuration program from the ServeRAID Configuration diskette, insert the diskette into the primary diskette drive and power-on the system. If the system is already powered on, press **Ctrl+Alt+Del**.

During the power-on self test (POST), the ServeRAID adapter checks the configuration information on the adapter and on the hard disk drives connected to it.

- If POST does not detect problems or changes, the Main Menu appears. See “The ServeRAID Adapter Main Menu.”
- If POST detects any change in the adapter configuration, a configuration error message is displayed. See “ServeRAID Adapter POST and Setup Messages” on page 71.
- If POST detects an adapter hardware problem, an error message is displayed. See “ServeRAID Adapter Status and Error Messages” on page 74.

### The ServeRAID Adapter Main Menu:

If more than one ServeRAID adapter is installed in the server, you will get an adapter selection screen similar to the following before the Main Menu appears.



#### Note

1. The version numbers on the screens might be different. Some menus might differ slightly, depending on the version that was shipped with the server.
2. The primary diskette drive is the first diskette drive that the system tries to start from.

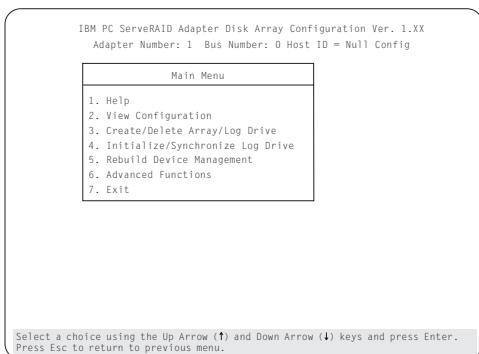
## Menu Navigation Keys

### Note

You can select **Help** from any menu.

**↑ key / ↓ key** To select a menu item, use these keys to highlight the item or press the number of the item then **Enter**.

**Esc key** Returns you to the previous screen or to the previous work area of a screen.



The Main Menu contains the following choices:

- **Help:** Provides additional information.
- **View Configuration:** Displays the existing disk array configuration.
- **Create/Delete Array/Log Drive:** Allows you to select the drives to create an array, or to delete an existing array. It also allows you to define and delete a logical drive.

Whenever you make changes to the disk-array configuration and select **Exit**, the Confirm pop-up window will appear. You must select **Yes** to save and activate the changes.

- **Initialize/Synchronize Log Drive:** Select this choice after creating an array:
  - **Initialize Logical Drive:** You *must* select this choice to set the logical drive to a predetermined value. Any data existing on the drive is overwritten with zeros.

You can choose to initialize more than one logical drive at a time. You can interrupt the initialization process at any time by pressing **Esc**. Then, you can either restart the initialization process by pressing **Enter**, or you can end the process by pressing **Esc** again.

- **Synchronize Logical Drive:** You *must* select this choice to recompute and rewrite the parity data on the selected drive for RAID level 5

before storing data. This selection does not alter data on the drive.

- **Rebuild/Device Management:** Select to rebuild logical drives. The rebuild operation is supported only for RAID levels 1 and 5. You also use this option to define or change the state of a drive, display drive information, and clear the device error table.
- **Advanced Functions:** Select this choice to change the write policy (the way data is written to the drive), to save the configuration information to a diskette, to restore it from a diskette, or to change ServeRAID parameters. This choice also allows you to perform a low-level format on a hard disk and run the RAID subsystems diagnostics. You can initialize the adapter configuration, which resets the configuration values to the factory defaults. You can also synchronize the primary and backup copies of the adapter configuration information.
- **Exit:** Select this choice to leave the Main Menu.

## Viewing the ServeRAID Configuration

Before creating or changing a disk array, you can look at the current configuration with the Administration and Monitoring program or the ServeRAID configuration program.

To view the disk-array configuration from the ServeRAID configuration program:

1. Start the server using the ServeRAID configuration program (see “Starting the ServeRAID Configuration Program” on page 35).
2. Select **View Configuration**. The current disk-array configuration information appears on the screen.
3. Press **Enter** to see the stripe order in the Bay/Array list. In the following example, data for the A array is striped across Channel 1, from bay 1, then bay 2, and so on, through bay 6.

IBM PC ServeRAID Adapter Disk Array Configuration Ver. 1.XX  
 Adapter Number: 1 Bus Number: 0 Host ID = Null Config

View Configuration						Ch 1 Array Bay			Ch 2 Array Bay			Ch 3 Array Bay					
1	ONL	A				1	ONL	B				1	ONL	C			
2	ONL	A				2	ONL	B				2	ONL	C			
3	ONL	A				3	ONL	B				3	ONL	C			
4	ONL	A				4	ONL	B				4	ONL	C			
5	ONL	A				5	DDD	B				5	ONL	C			
6	ONL	A				6	HSP					6	ONL	C			
7	RDY					7	DHS					7	CDR				
8						8						8					
9	RBL	B				9						9	SHS				
10						10						10	TAP				
11						11						11					
12						12						12					
13						13						13					
14						14						14					
15						15						15					

Array ID	Size	Log Dry (MB)	Size RAID Level	Date Created	Status
A	4300	A0	500 RAID-0	12/12/95	OKY WT
B	4300	B0	500 RAID-0	12/12/95	OFL WT
C	4300	C0	500 RAID-0	12/12/95	OKY WT

Press Esc to return to main menu. Select array using cursor keys and press Enter to view the stripe order.

4. Press any key to return to the View Configuration screen.



- Press **Esc** to return to the Main Menu.

## Performing Common Tasks

The Create/Delete Array menu of the ServeRAID configuration program contains the more common tasks for configuring disk arrays. Use the following procedures to complete these tasks.

- “Creating a Disk Array”
- “Defining Logical Drives” on page 39
- “Defining a Hot-Spare Drive” on page 43
- “Deleting a Disk Array” on page 44
- “Deleting a Logical Drive” on page 45
- “Redefining Space in an Array” on page 46
- “Defining the State of a Drive” on page 51

### Creating a Disk Array:

To create a disk array using the ServeRAID configuration program:

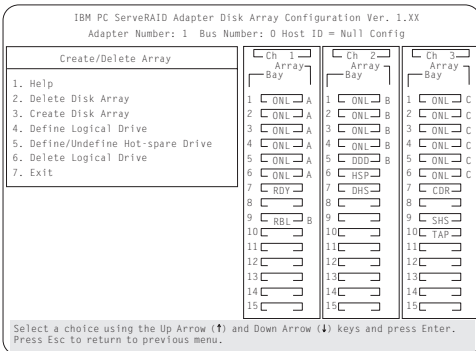
- Start the server using the ServeRAID configuration program (see “Starting the ServeRAID Configuration Program” on page 35).

#### Note

To create an array using hard disks in an existing array, see “Redefining Space in an Array” on page 46.

- Select **Create/Delete Array/Log Drive** from the Main Menu.
- Select **Create Disk Array** from the Create/Delete Array menu.

The cursor becomes active in the Bay/Array selection list.



### Note

Carefully determine which drives to include in the array before beginning the selection process. If you change your mind after selecting the drives for an array, you can delete the array (by selecting **Delete Disk Array** from the Create/Delete Array menu) and then begin again.

4. Select each drive you want in the array by using the Up Arrow (↑) key or the Down Arrow (↓) key to highlight the drive and then pressing **Enter**. As you select each drive, the status will change from **RDY** (Ready) to **ONL** (Online).
5. When you have selected all the drives you want to include in the array, press **Esc**. The cursor will become active in the menu.

### Notes

- When the stripe unit size is 8 K or 16 K, the maximum number of drives in an array is 16.
  - When the stripe unit size is 32 K or 64 K, the maximum number of drives in an array is 8.
6. If you have drives you did not use in this array and you want to create another array, you can do one of the following:
    - Define the logical drive or drives for this array; then create another array and its logical drives. See “Defining Logical Drives.”
    - Create another array now by repeating steps 2 through 5 in this procedure; then define logical drives for both arrays.

### Note

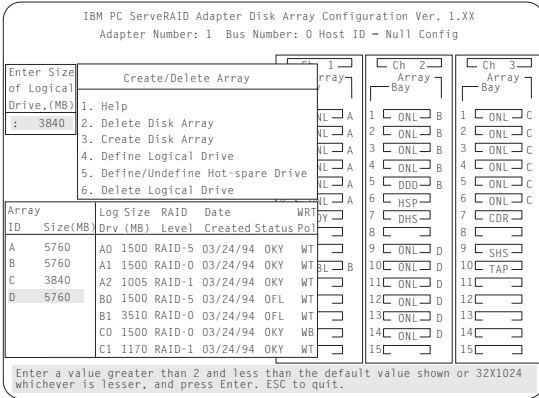
You must define at least one logical drive for each array created before you can exit from the ServeRAID configuration program.

## Defining Logical Drives:

After you have created an array, you must define a logical drive. You can use the Administration and Monitoring program or the ServeRAID configuration program. When you use the Administration and Monitoring program from the active operating system desktop, you do not have to restart the server. Refer to the README file on the Administration and Monitoring program for instructions for the operating system. (You cannot leave the ServeRAID configuration program until you define the logical drives for any arrays created.)

To define a logical drive:

1. Start the ServeRAID configuration program (see “Starting the ServeRAID Configuration Program” on page 35).
2. Select **Define Logical Drive** from the Create/Delete Array menu. The following screen appears; the cursor is active in the Bay/Array list.



3. Use the Up Arrow (↑) key or the Down Arrow (↓) key to highlight the array you want to define; then press **Enter**. The Select RAID Level pop-up window appears, and the cursor is active in the window.

**Note**

The system automatically assigns RAID level 0 to any logical drives defined in an array containing only one hard disk drive. When this is the case, the Select RAID Level pop-up window will not appear.

If only two hard disk drives are in the array, the Select RAID Level pop-up window appears, but RAID level 5 is not selectable because you need at least three hard disk drives in an array to assign RAID level 5 to one of the logical drives. More than one logical drive can be defined in the array. The maximum number of logical drives you can define is eight; the maximum number of physical drives in an array is 8 or 16, depending on the stripe unit size.

### Notes

1. If you are planning to change RAID levels using the Administration and Monitoring program, the maximum number of logical drives that can be defined is 7. The RAID conversion procedure requires one free logical drive.
2. When the stripe unit size is 8 K or 16 K, the maximum number of drives in an array is 16. When the stripe unit size is 32 K or 64 K, the maximum number of drives in an array is 8.

4. Use the Up Arrow (↑) key or the Down Arrow (↓) key to highlight the RAID level you want to assign to these logical drives; then press **Enter**.

### Note

Because the level you assign can influence the space needed for the drive, you must assign a RAID level before you enter the size of the logical drive.

The Logical Drive list contains the logical drive ID, the size of each logical drive, the RAID level you assigned to that logical drive, and the date that the logical drive was created.

The status of the logical drive also is shown.

- OKY** means that all is well with the drive.
- CRT** means that you must replace the hard disk drive or rebuild the logical drive. (You will have received a message during system startup telling you what has happened to the drive.)
- OFL** means that the logical drive is irrecoverable; the data on that drive is lost.

If this is the first logical drive to be defined, the Logical Drive Size pop-up window shows the space in the array that is available for logical drives.

If other logical drives have been defined, the Allocation Table appears, showing the logical drive sizes already created, and the amount of free space available.

5. Type the size, in megabytes, that you want for the logical drive; then press **Enter**. A pop-up window appears, asking you to confirm your action.

Information about the new logical drive appears in the Logical Drive list.

**Note**

The size appearing in the Logical Drive list might be different from the size you typed. The size of a logical drive is determined by a number of factors, but basically the size must be divisible by the number of drives in the array.

Consider the following scenarios:

**Scenario 1:**

The array consists of three 1 GB drives. You assign RAID level 0 (which uses all the drives in the array with no parity storage), and type 1000MB. The number in the Size (MB) field will be 999, which is the number closest to and lower than 1000 that is divisible by 3.

**Scenario 2:**

The array consists of three 1 GB drives. You assign RAID level 1, which provides a disk mirroring that stripes data across all drives in the array. Because the data is mirrored, the capacity of the logical drive is 50 per cent of the physical capacity of the hard disk drives grouped in the array. Type 1000MB; the number in the Size (MB) field will be 999. The physical capacity used is 2000 MB, twice that of the logical drive size. The number that is closest to or lower than 2000 and is divisible by 3 is 1998. The logical drive size is 999, which is 50% of the physical capacity.

**Scenario 3:**

The array consists of three 1 GB drives, and you assign RAID level 5. Data is striped across all three drives in the array, but the space equivalent to that of one drive is used for redundant storage. Therefore, if you type 1000MB, the number in the Size (MB) field remains 1000 because it is divisible by 2 (drives), which is the space available for data.

If you do not use the entire array for this logical drive, you can create another by assigning either the same or a different RAID level for an additional logical drive. You can have as many as eight logical drives among eight disk arrays.

- To return to the Create/Delete Array menu, press **Esc**. To define more logical drives, repeat steps 1 through 5 of this procedure.
- To leave this screen, select **Exit** or press **Esc**. A pop-up window appears asking you to confirm your action.
- To save the changes, select **Yes**. To maintain the disk-array configuration that was in place before you made changes, select **No**.
- To ensure that the server operates correctly, you must select **Initialize Logical Drive**. This sets

the drive to a predetermined state. The initialization process overwrites any data on the drive with zeros.

- a. Select **Initialize/Synchronize Log Drive** from the Main Menu; then select **Initialize Logical Drive**.
- b. Select the logical drives you want to initialize from the Logical Drive list by pressing the Spacebar (the selected drives will appear highlighted). To start the initialization, press **Enter**. A pop-up window appears, asking you to confirm your action.

**Attention**

If you select **Yes** in the Confirm pop-up window, information in the logical drive will be overwritten with zeros.

- c. Select **Yes** to confirm that you want to initialize this logical drive.

The initialization process begins, and you can see its progress in the **Pct. Int.** (Percent Initialized) column of the Logical Drive list.

- d. To stop the initialization at any time, press **Esc**. Then press **Esc** again to return to the menu, or press **Enter** to continue initializing the drive.
- e. If you defined the drive as RAID level 5, select **Initialize/Synchronize Log Drive** from the Main Menu; then, select **Synchronize Logical Drive** before storing data.

**Note**

To back up the disk-array configuration to diskette, you will need a 3.5-inch formatted diskette.

To back up the disk-array configuration:

- a. Select **Advanced Functions** from the Main Menu.
- b. Select **Backup config. to diskette**.

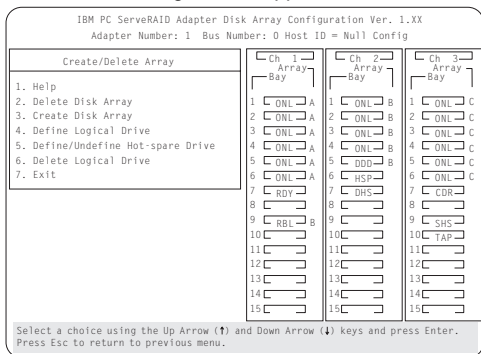
Follow the instructions on the screen. A pop-up window shows the default file name of CONFIG. You can change the file name by typing over the default. The Backup program will assign a file-name extension of *.ips*.

## Defining a Hot-Spare Drive:

You can define a hot-spare drive from the Create/Delete Array/Log. Drive menu or the Rebuild/Device Management menu (see "Defining the State of a Drive" on page 51).

To define a drive as a hot-spare drive from the **Create/Delete Array/Log. Drive** menu:

1. Start the server using the ServeRAID configuration program (see “Starting the ServeRAID Configuration Program” on page 35).
2. Select **Create/Delete Array/Log. Drive** from the Main Menu. The following screen appears.



3. Select **Define/Undefine Hot-spare Drive**. The cursor will become active in the Bay/Array selection list.
4. Use the Up Arrow (↑) key or the Down Arrow (↓) key to highlight the **RDY** (Ready) drive you want to define as the hot spare; then press **Enter**. The **RDY** changes to **HSP** (Hot Spare). You can press **Enter** again to toggle between **HSP** and **RDY**.
5. Press **Esc** when you have finished. The cursor will become active in the **Create/Delete Array/Log. Drive**
6. If you want to create a disk array, go to “Creating a Disk Array” on page 38.
7. If you are finished:
  - a. Select **Exit** or press **Esc**. A pop-up window will appear asking you to confirm your change.

#### Note

The changes you make are not saved until you confirm them by selecting **Yes** in the Confirm pop-up window.

- b. Select **No** if you do not want the drive you selected to be a hot spare; select **Yes** to define it as a hot-spare drive.
- c. Back up the disk-array configuration information to diskette. See “Backing Up The Disk-Array Configuration” on page 61 for instructions.

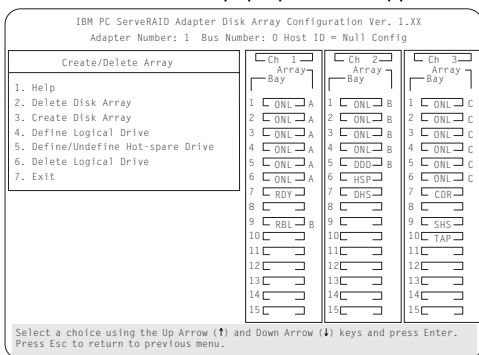
## Deleting a Disk Array

#### Attention

All the data and programs in the array are lost during this procedure. Before proceeding, back up any data and programs that you want to save.

To delete a disk array:

1. Start the ServeRAID configuration program (see “Starting the ServeRAID Configuration Program” on page 35).
2. Select **Create/Delete Array/Log Drive** from the Main Menu.
3. Select **Delete Disk Array** from the Create/Delete Array menu. The cursor will be active in the Array list.
4. Select the array that you want to delete.
5. Press **Del**. The Confirm pop-up window appears.



6. If you do not want to delete the array, select **No**. To delete the array, select **Yes**.

### Notes

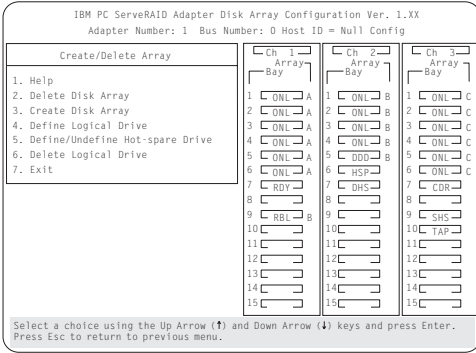
1. To use hard disks from the existing array when creating a new array, you must confirm the deletion of the existing array.
2. In some operating systems, deleting an array and associated logical drives might change the drive letters assigned to the existing drives.

If a defunct drive is still in a bay, the status shows a Defunct Hot-spare (DHS) drive. You can select **Rebuild/Device Management**, then reset the drive state by selecting **Set Device State** (see “Defining the State of a Drive” on page 51 for more information). If the drive is good, set the drive state to Hot-Spare (**HSP**); then, select the drive again and set the drive to **Ready (RDY)**. If the drive is defective, replace it with a good drive; then set the new drive state to **Ready (RDY)**.

### Deleting a Logical Drive

1. Start the ServeRAID configuration program (see “Starting the ServeRAID Configuration Program” on page 35).
2. Select **Create/Delete Array/Log Drive** from the Main Menu.





3. Select **Delete Logical Drive** from the Create/Delete Array menu and press **Enter**.
4. Press the Up Arrow (↑) or Down Arrow (↓) key to highlight the logical drive that you want to delete.
5. Press **Del**. The Confirm pop-up window appears.
6. If you do not want to delete the logical drive, select **No**. To delete the logical drive, select **Yes**.
7. Select **Exit** or **Esc** to return to the main menu.

#### Note

In some operating systems, deleting an array and associated logical drives might change the drive letters assigned to the existing drives.

## Redefining Space in an Array:

You can redefine space in a disk array in a number of ways. For example, you can combine a number of small logical drives to create a larger one, or you can redefine the existing logical drive into several smaller drives. Also, you can install additional hard disk drives and create a larger logical drive than was possible with the existing storage capacity.

One method to redefine space in an array is to change the RAID level assigned to a logical drive. For example, if you assigned RAID level 1 to a logical drive and then decided you needed the capacity offered with RAID level 5, you can use this procedure to replace the existing logical drive with a logical drive assigned the new RAID level.

To redefine the space in a disk array, first you must delete the array. In all cases, when you delete an array, all the data and programs in the array are lost.

If you have data and programs that you want to save, they must be backed up and then restored. You might want to use a high-speed backup device, such as a tape drive, for that purpose.

To redefine the space in an array:

**Note**

You need a 3.5-inch, formatted diskette to backup the configuration file, as described in this procedure.

1. Back up all data and programs in the array.
2. If needed, install additional hard disk drives.  
See "Hard Disk Drive Capacities" on page 32 for information about drive sizes.

**Attention**

In all cases, when you delete an array, all the data and programs in the array are lost.

3. Start the ServeRAID configuration program (see "Starting the ServeRAID Configuration Program" on page 35).
4. Delete the existing array:
  - a. Select **Create/Delete Array/Log Drive** from the Main Menu.
  - b. Select **Delete Disk Array**. The cursor will be active in the Bay/Array selection list.
  - c. Select the array that you want to delete.
  - d. Press **Del**. The Confirm pop-up window appears.
  - e. If you do not want to delete the array, select **No**. To delete the array, select **Yes**.

**Note**

To use the hard disks from the existing array when creating a new array, you must confirm the deletion of the existing array. After you make your selection, the Confirm pop-up window will disappear, and the cursor will be active in the menu.

- If you want to define a hot spare drive, see "Defining the State of a Drive" on page 51 for step-by-step instructions.
- Create a new disk array and define logical drives.

See "Creating a Disk Array" on page 38 for instructions on creating a disk array and defining logical drives.

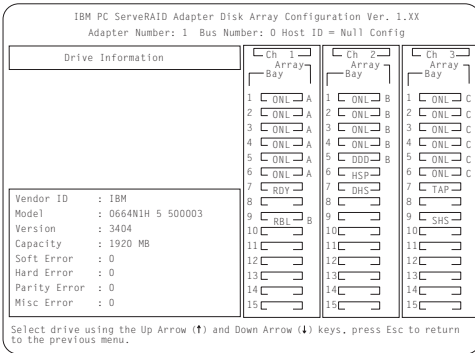
5. After you have established the new array and logical drive or drives, select **Initialize/Synchronize Log Drive** from the Main Menu; then select **Initialize Logical Drive** to prepare the drives in the array to receive data. This sets the drive to a predetermined state. Any data existing in the drive is overwritten with zeros.
6. If you defined the drive as RAID level 5, select **Initialize/Synchronize Log Drive** from the Main Menu; then, select **Synchronize Logical Drive** before storing data. Once synchronization starts, it cannot be interrupted until the operation is complete.
7. Insert a 3.5-inch formatted diskette in the primary diskette drive, select **Advanced Functions** from the Main Menu; then select **Backup config. to diskette**. Follow the instructions on the screen.
8. Exit the ServeRAID configuration program by pressing **Esc** or selecting **Exit** from the Main Menu. A pop-up window will appear asking you to confirm your action.
9. Reinstall the operating system and device drivers, then restore the data and programs.

## Drive Maintenance:

The following information is about the status indicators for logical and hard disk drives, and the results of a hard disk drive failure. It also contains procedures for defining the state of a hard disk drive and replacing defunct drives.

**Obtaining Drive Status:** Use the following procedure to see the ID, capacity, type of errors that occurred, and other information about each of the hard disk drives attached to the ServeRAID adapter.

1. Start the ServeRAID configuration program (see "Starting the ServeRAID Configuration Program" on page 35).
2. Select **Rebuild/Device Management** from the Main Menu.
3. Select **Display Drive Information** from the Rebuild/Device Management menu. The cursor becomes active in the Bay/Array selection list.
4. Use the Up Arrow (↑) key or the Down Arrow (↓) key to highlight each of the drives in the Bay/Array selection list. As a drive is highlighted, the drive information appears.



- **Soft Errors** displays the number of SCSI Check Conditions Returned from the Drive status messages (except Unit Attention messages) since the Device Error Table was last cleared.
- **Hard Errors** displays the number of SCSI I/O processor errors or Predictive Failure Analysis (PFA errors) that occurred on the drive since the Device Error Table was last cleared.
- **Parity Errors** displays the number of parity errors that occurred on the SCSI bus since the Device Error Table was last cleared.
- **Misc Errors** displays the number of other errors (such as selection timeout, unexpected bus free, or SCSI phase error) that have occurred on the drive since the Device Error Table was last cleared.

5. Press **Esc** to return to the previous menu.

### Notes

- The status of the hard disk drive determines the status of the logical drives in the array in which the hard disk is grouped.
- The device error table, located in the ServeRAID adapter NVRAM, collects statistics on the number and type of errors that occurred on all hard disk drives attached to the ServeRAID adapter.

After correcting a problem with the disk array, you might want to clear the table, so that any subsequent errors can be identified quickly. Select **Erase Device Error Table** from the Rebuild/Device Management menu.

### Bay/Array Selection List:

The physical devices connected to each Channel are defined in the Bay/Array selection list as follows:

Status	Meaning
CDR	A CD-ROM drive is installed.

<b>DDD</b>	A drive in the Online (ONL) or Rebuild (RBL) state has become defunct; it does not respond to commands.
<b>DHS</b>	A hot spare or standby hot spare drive enters the Defunct Hot-spare (DHS) state if it fails to respond to the adapter commands.
<b>EMP</b>	No device is present in the bay. This state is represented on the screen with blanks or dashes (— —).
<b>HSP</b>	A hot-spare drive is a hard disk drive that is defined for automatic use when a similar drive fails. The drive capacity of the replacement HSP drive must be equal to or greater than the capacity of the drive being replaced. You must have at least four hard disk drives if you want a hot spare and RAID level 5.
<b>ONL</b>	The drive is online and part of an array.
<b>RBL</b>	The drive is being rebuilt. A physical hard drive can enter the RBL state if: <ul style="list-style-type: none"> <li>• A good working drive replaces a defunct (DDD) drive that is part of the critical logical drive. At the end of a successful rebuild, the state of the physical drive becomes online (ONL), and the state of the corresponding logical drives changes to OKY.</li> <li>• An online drive that is part of a logical drive becomes defunct (DDD) and an HSP or SHS drive with the same or greater capacity is available. The state of the hot-spare drive becomes RBL during the rebuild. When the rebuild completes successfully, the state changes to ONL; the former hot-spare drive is now part of the logical drive.</li> <li>• A Ready (RDY) or Standby (SBY) drive replaces a defunct (DDD) drive that is part of the critical logical drives. The state of the RDY or SBY drive becomes RBL during the rebuild. At the end of a successful rebuild, the state of the drive becomes online (ONL); the drive is now part of the logical drive.</li> </ul> <p>For more information on rebuilding a drive, see “Rebuilding a Logical Drive” on page 57.</p>
<b>RDY</b>	The ready drive is recognized by the adapter and is available for definition. A RDY drive becomes EMP when the drive is physically removed from the bay.
<b>SBY</b>	A standby drive is a hard disk drive that has been spun down. Devices such as tape drives and CD-ROM drives are considered to be in a Standby state.

**SHS** A standby hot-spare is a hot spare drive that has been spun down. If a drive becomes defunct and no suitable Hot-Spare drive is available, a Standby Hot-Spare of the appropriate size spins up, and enters the Rebuild process. You must have at least four hard disk drives if you want a standby hot spare and RAID level 5.

**TAP** A tape drive is installed.

## Logical Drive States:

The state of the logical drive is determined by the state of the physical drives. Replacing a defunct drive with a good drive changes the state of the logical drive from offline (OFL) to critical (CRT) or good (OKY). When a defunct drive is replaced in a critical logical drive, the data is rebuilt in the replaced drive, before the state of the logical drive changes to OKY.

Status	Meaning
<b>OKY</b>	The drive is in a good functional state.
<b>FRE</b>	The drive is not defined.
<b>OFL</b>	The logical drive is offline and not accessible. This state occurs if one or more physical drives in a non-redundant logical drive (RAID level 0) is defunct. This state also occurs when two or more physical drives in a redundant logical drive (RAID levels 1 and 5) are defunct.
<b>CRT</b>	A logical drive that is defined as RAID level 1 or 5 contains a defunct physical drive. A critical (CRT) logical drive is accessible despite a physical drive failure.

### Note

If the logical drive is critical, you must rebuild the defunct drive.

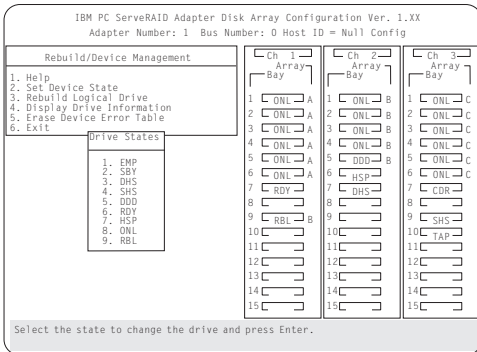
## Defining the State of a Drive:

To define the state of a physical hard disk drive attached to the ServeRAID adapter, you can use the Administration and Monitoring program or the ServeRAID configuration program. By using the Administration and Monitoring program from the active operating system desktop, you do not have to restart the server. Refer to the README file on the Administration and Monitoring program for instructions for the operating system.

To define the state of a drive from the ServeRAID configuration program:

1. Start the ServeRAID configuration program (see "Starting the ServeRAID Configuration Program" on page 35).

2. Select **Rebuild/Device Management** from the Main Menu.
3. Select **Set Device State**. The cursor will become active in the Bay/Array selection list.



4. Use the Up Arrow (↑) key or the Down Arrow (↓) key to highlight the appropriate drive; then, press **Enter**. The Drive States pop-up window appears, listing all hard disk drive states.
5. Highlight the appropriate drive state and press **Enter**. The cursor will become active in the Bay/Array selection list, and will display the new state.

The numbers shown on the left in the Bay/Array selection list area in the previous figure are the bay numbers. See “Bay/Array Selection List” on page 49 for an explanation of the bay numbers.

6. If you want to create a disk array, go to “Creating a Disk Array” on page 38.
7. If you are finished:
  - a. Select **Exit** or press **Esc**. A pop-up window will appear asking you to confirm your change.

#### Note

The changes you make are not saved until you confirm them by selecting **Yes** in the Confirm pop-up window.

- b. Select **No** if you do not want the drive you selected to use the new drive state. Select **Yes** to accept the new drive state.
- c. Back up the disk-array configuration information to diskette. See “Backing Up The Disk-Array Configuration” on page 61 for instructions.

## Results of a Hard Disk Drive Failure:

Depending on the circumstances, a drive failure can result in several possible situations.

### Scenario 1:

- Only one hard disk drive fails.

- A hot-spare drive is defined that is the same size or larger than the failed drive.

The hot spare will take over immediately.

#### Note

Any logical drives with RAID level 0 are blocked during the Rebuild process, and remain blocked until unblocked. The ServeRAID configuration program automatically unblocks all drives at the end of the rebuild operation.

#### Scenario 2:

- Only one hard disk drive fails.
- A hot-spare drive is not defined or is smaller than the failed drive.
- The logical drives in the array are assigned RAID levels 0, 1, 5, or a combination of these levels.

All data in logical drives assigned RAID level 0 will be lost. In this array, the logical drives that are assigned RAID level 1 or 5 will be in Critical (CRT) state. The logical drives assigned RAID level 0 will be in the Offline (OFL) state.

#### Scenario 3:

If more than one drive in an array fails, all the data is lost in all of the logical drives of the array. For this reason, it is important that you replace and rebuild a defunct drive as soon as possible.

## Logical and Hard Disk Drive Status Indications:

The status of the hard disk drive determines the status of the logical drives in the array in which the hard disk is grouped.

- A single hard disk drive failure, (indicated by a **DDD** status in the Bay/Array selection list), generates a **CRT** status for the array's logical drives that are assigned levels 1 and 5. Data in logical drives with a **CRT** is not lost. You must replace the one defunct hard disk drive promptly, and perform a Rebuild operation. If two hard disk drives were to fail, all of the data in the array would be lost.

After you install a new hard disk drive, the Replace process changes the drive status from **DDD** to **RBL** if the array contains a **CRT** logical drive. After the Rebuild process, the hard disk drive status changes from **RBL** to **ONL**.

- A multiple hard disk drive failure causes logical drives in that array that to have an Offline (OFL) status. This means that data is lost in all the logical drives in

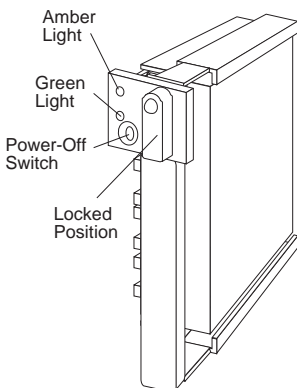


that array, regardless of which RAID level is assigned.

## Replacing a Faulty Drive

### Note

The LEDs on the hard disk drive tray provide information about the status of the drive.



The following is a summary of the LED states and their meanings.

Green	Amber	Description
On	Off	Drive tray is powered on; the hard disk drive is inactive; and the drive should <i>not</i> be removed.
Blinking	Off	The hard disk drive is inactive. The hot-swap drive can be removed safely.
On	On or Blinking	The hard disk drive is in use, and should <i>not</i> be removed.
Off	Off	The drive is defective, or no power is being supplied to the drive. The hot-swap drive can be removed safely.

Check the drive for damage. If the drive is not damaged, check the position of the drive. If it is not inserted correctly, reposition the drive. Verify that the drive is positioned correctly.

Use the following procedure to replace a faulty drive using the ServeRAID configuration program:

1. Start the ServeRAID configuration program (see "Starting the ServeRAID Configuration Program" on page 35).

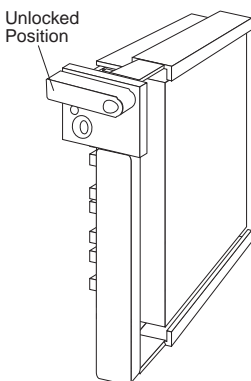
If the drive failed while the system was powered down, a message identifying the defunct drive appears the next time the system is powered on.

2. Physically replace the drive or assign a hot-spare or other appropriate drive as a replacement:

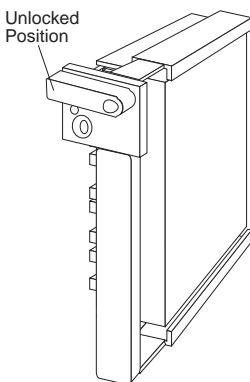
**Attention**

Removing the wrong hard disk drive can cause loss of all data in the array.

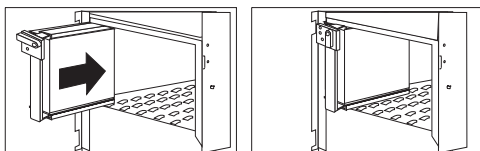
3. If you are assigning a hot-spare or another appropriate drive to replace the defunct drive, go to “Rebuilding a Logical Drive” on page 57. If you are physically replacing the hard disk drive, go to step 4.
4. Press the power-off switch on the drive tray. When the green LED begins to blink, it is safe to remove the drive.
5. Unlock the drive by turning the knob clockwise 90 degrees.



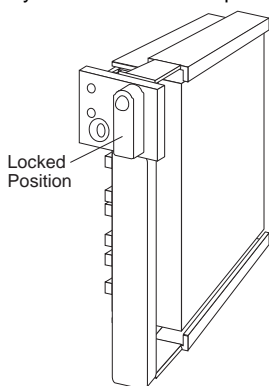
6. Disconnect the drive from the connector on the backplane, by grasping the handle on the drive tray and pulling the drive out of the server. Store the drive in a safe place.
7. Install the hard disk drive:
  - a. Move the tray knob to the unlocked position.



- b. Position the drive tray assembly vertically, with the connector facing the rear of the server.
- c. Align the side of the tray with the raised guides on the bottom of the bay. (Note the arrows pointing towards the backs of the bays.)



- d. Slide the drive tray to the rear of the bay until it connects to the backplane. Be sure it is connected properly to the backplane.
- e. Move the tray knob to the locked position.



**Note**

The green light on the front of the drive tray illuminates, indicating that the drive was installed correctly.

8. Go to “Rebuilding a Logical Drive” on page 57.

## Rebuilding a Logical Drive:

Review the following information before you rebuild a logical drive.

- If the logical drive is critical, you must rebuild the defunct drive.
- Data in a logical drive assigned RAID level 0 is lost during a rebuild. If the drive was backed up before it failed, you can restore the data to this drive.
- If a physical drive being rebuilt contains logical drives defined as RAID level 1 or 5 and a logical drive at RAID level 0, the RAID level 0 drive is blocked to external access during the rebuild.
  - If you initiated the rebuild through the Administration and Monitoring program, you must

unblock the RAID level 0 drive when the rebuild is complete.

- If you initiated the rebuild through the ServeRAID configuration program and the rebuild was interrupted, drives with RAID Level 0 can be automatically unblocked when you restart the server.
- Only one rebuild operation can take place at a time.
- The drive being rebuilt must be the same size or larger than the failed drive.
- If multiple hot-spare drives are available, the adapter searches all bays on each channel for a hot-spare drive of the appropriate size; the first one found enters the Rebuild state.
- Under the following circumstances, a Rebuild operation can be completed quickly:
  - The defunct (DDD) drive was *not* defective.
  - The drive is in the same bay.
  - No write operations or configuration changes that require rebuilding data in the drive have occurred since the hard disk drive entered the DDD state.

If you are using one of the Administration and Monitoring programs provided with the disk-array system, you can use it to identify the defunct drive and designate a drive to replace the defunct drive without restarting the server. Refer to the README file on the Administration and Monitoring program for instructions on the operating system.

To replace a faulty drive using the ServeRAID configuration program:

1. Start the ServeRAID configuration program. When the *Following drives not responding* prompt appears, press **F5** to continue loading the ServeRAID configuration program.
2. Select **Rebuild/Device Management** from the Main Menu.
3. Select **Rebuild Drive** from the Rebuild/Device Management menu. The cursor becomes active in the Bay/Array list.
4. Select the replacement drive that you want to use for the rebuild operation. A pop-up window appears.
  - Select **Same Location** if you physically replaced a hard disk drive in the same bay.
  - Select **New Location** to assign a hard disk drive in a new location. You will be prompted to select the drive that you want.

Information and status messages about each stage of the rebuilding process appears on the screen.

5. When the rebuilding process is completed, press **Esc** to return to the Main Menu. The new configuration will be saved automatically.

6. Backup the new configuration (see “Backing Up The Disk-Array Configuration” on page 61).
7. Select **Exit** to end the ServeRAID configuration program.
8. Remove the diskette and press **Ctrl+Alt+Del** to restart the system.

## Resetting the Adapter Configuration

The RAID configuration information stored in the adapter NVRAM is critical to reliable operation of the disk-array. Therefore, to protect the integrity of the configuration information, copies of the configuration information are stored in the adapter EEPROM and on each hard disk drive in a Rebuild or Online state that is defined in the adapter NVRAM configuration. Each time the configuration information is changed, all corresponding copies are updated.

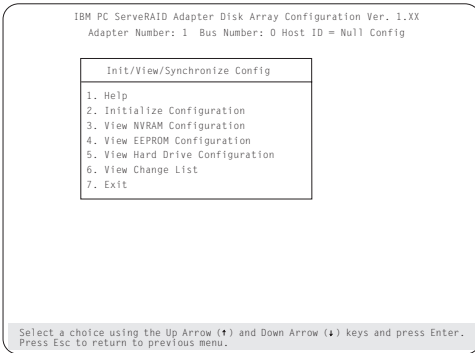
During POST, if the configuration information in the adapter NVRAM, EEPROM, and hard disk drive does not match, an error message appears. You can view each configuration to determine which you want to use.

The Init/View/Synchronize Configuration menu enables you to view or reset the following parameters:

- **Initialize Configuration** restores the factory default settings, and resets all functional, connected, hard disk drives to the Ready (RDY) state.
- **View NVRAM Configuration** displays the current configuration settings for the adapter's NVRAM.
- **View EEPROM Configuration** displays the current configuration settings for the adapter's EEPROM.
- **View Hard Drive Configuration** displays the current configuration settings for the selected hard disk drive that is in the online (ONL) or rebuild (RBL) state.
- **View Change List** displays the configuration conflicts that the ServeRAID adapter reported since the last time the server was powered on or restarted. For more information, see “Viewing Configuration Changes” on page 59.

To initialize, reset, or view the adapter configuration:

1. Start the ServeRAID configuration program (see “Starting the ServeRAID Configuration Program” on page 35).
2. Select **Advanced Functions** from the Main Menu.
3. Select **Init/View/Synchronize Config**.
4. Select your choice from the next menu; then press **Enter**.



5. Follow the instructions on the screen.

## Viewing Configuration Changes:

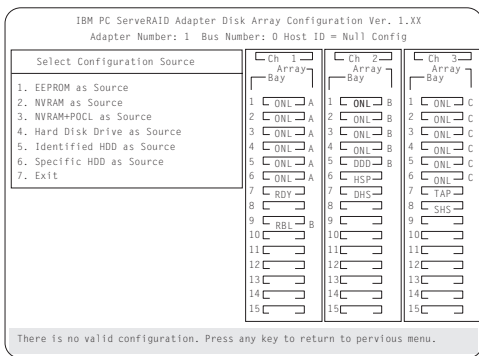
This option allows you to view the configuration changes that might have occurred since the last time the server was powered on or restarted.

- **View Power-on Change List** displays any drives that have changed states since the last time the server was powered on or restarted.
- **View Wrong SCSI ID List** provides a list of hard disk drives that were found at a different SCSI ID location than the last time the server was powered on or restarted.
- **View Unidentified Drive List** provides a list of hard disk drives that have an identifier that does not match the stored configuration information.

The identifier consists of both the configuration host ID and a time stamp. You can define the host ID as the server serial number or any string, up to 12 characters. (See “Changing the ServeRAID Adapter Parameters” on page 67 for more information.)

## Synchronizing the Adapter Configuration:

When the configuration information in the adapter NVRAM, EEPROM, and hard disk drives does not match, you can select one source, and copy the selected configuration information to the other locations. This menu provides options to synchronize this configuration information.



- **EEPROM as Source** copies configuration information from the adapter EEPROM to NVRAM and to all hard disk drives in a Rebuild or Online state that are defined in the adapter EEPROM configuration.
- **NVRAM as Source** copies the configuration information from NVRAM to the adapter EEPROM and to all hard disk drives in a Rebuild or Online state defined in the NVRAM configuration.
- **NVRAM and POCL as Source** updates information from the power-on change list with the information in NVRAM. This information is then copied to the adapter EEPROM and to all hard disk drives in a Rebuild or Online state that are defined in the NVRAM configuration.
- **Hard Disk Drives as Source** retrieves configuration information from hard disk drives. The configuration information is then copied to the adapter NVRAM and EEPROM.
- **Identified HDD as Source** updates the configuration information with stored configuration information on a hard disk drive that matches the identifiers stored in the NVRAM. The updated configuration information is then copied to NVRAM, the adapter EEPROM, and the hard disk drives configured in an array.
- **Specific HDD as Source** retrieves the configuration information with stored configuration information on the hard disk drive that you select. The updated configuration information is then copied to NVRAM, EEPROM, and configured hard disk drives.

## Running RAID Subsystem Diagnostic Tests

The ServeRAID Subsystem Diagnostic program provides several utility programs that allow you to test the ServeRAID adapter and the devices connected to it.

To run the RAID diagnostic utility programs, do the following steps:

1. Start the ServeRAID configuration program (see “Starting the ServeRAID Configuration Program” on page 35).
2. Select **Advanced Functions** from the Main Menu.
3. Select **IBM RAID Subsystem Diagnostic**.
4. Select the diagnostic test that you want to run and press **Enter**:
  - **Run Adapter Self-test** runs diagnostic tests on the ServeRAID adapter.
  - **SCSI Device Self-test** runs diagnostic tests on the SCSI devices attached to the ServeRAID adapter.
  - **Drive Media Test** verifies that all sectors on a hard disk drive can be accessed. The drive must be in the RDY or HSP state.
  - **Format Drive** performs a low-level format on a hard disk drive. For more information, see “Formatting Drives” on page 64.
5. Follow the instructions on the screen.

## Additional Disk-Array Tasks

The following procedures are for performing additional, less common, disk-array tasks. You can select several utility programs:

- Back up configuration to diskette
- Restore configuration to diskette
- Change the write policy
- Change the RAID parameters
- Format a drive
- Obtain drive status
- Change the ServeRAID adapter parameters

### Attention

Notices appear throughout the following procedures to alert you about potential loss of data. Similar messages appear on the screens for these procedures. Read these messages carefully before answering yes to the confirmation requests.

## Backing Up The Disk-Array Configuration

: The ServeRAID adapter maintains a record of the disk-array configuration information in its nonvolatile RAM (NVRAM) and electrically erasable programmable read-only memory (EEPROM) module. The disk-array configuration is *vital information*. To protect this information, back up the information to diskette as soon as you have completed your tasks.

To back up the disk-array configuration information to diskette:



### Note

You need a blank, formatted, 3.5-inch diskette.

1. Label a blank diskette "Disk Array Configuration Backup," and date it.
2. Start the ServeRAID configuration program (see "Starting the ServeRAID Configuration Program" on page 35).
3. Select **Advanced Functions** from the Main Menu.
4. Select **Backup config. to diskette**.
5. Remove the ServeRAID Configuration diskette from the drive and insert the blank diskette.
6. Follow the instructions on the screen.

## Restoring the Disk-Array Configuration

To restore the disk-array configuration information in the ServeRAID adapter, use the ServeRAID Configuration diskette and an up-to-date Disk Array Configuration Backup diskette.

### Note

Because dynamic changes in the configuration of the disk array occur due to hot-spare drive replacement or other drive maintenance activity, the configuration backup information on the diskette might be different from that in the adapter. It is important that you back up the disk-array configuration information frequently, to keep the backup information on the diskette current.

To restore the ServeRAID configuration information:

1. Start the ServeRAID configuration program (see "Starting the ServeRAID Configuration Program" on page 35).
2. Select **Advanced Functions** from the Main Menu.
3. Select **Restore config. from diskette**.
4. Follow the instructions on the screen.

## Changing the Write Policy

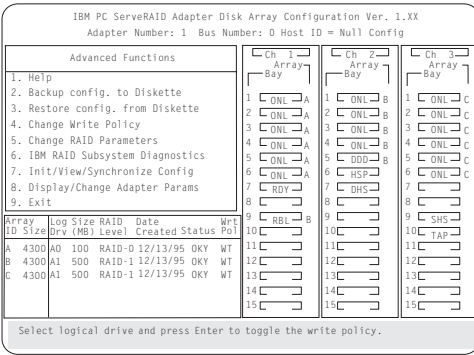
When you configure a logical drive, the RAID adapter automatically sets the write policy to *write-through* (WT) mode, where the completion status is sent *after* the data is written to the hard disk drive. Under certain workloads, you can improve performance by changing this write policy to *write-back* (WB) mode, where the completion status is sent *after* the data is copied to adapter cache memory, but *before* the data is actually written to the hard disk drive.

Although you gain performance with write-back mode, it creates a greater risk of losing data due to a power failure. This is because the system gets a completion status message when the data reaches adapter cache memory, but *before* data is actually written to the hard disk drive.

If you change the write policy to write-back, wait at least 10 seconds after your last operation before you power-off the server. It takes that long for the system to move the data from the adapter cache memory to the hard disk drive. Failure to follow this practice can result in lost data.

To change the write policy:

1. Start the ServeRAID configuration program (see “Starting the ServeRAID Configuration Program” on page 35).
2. Select **Advanced Functions** from the Main Menu.
3. Select **Change Write Policy** from the Advanced Functions menu. The cursor will be active in the Logical Drive list.
4. Select the logical drive whose write policy you want to change. A screen similar to the following appears:



**Note**

The information might be different from that shown in this screen.

The Logical Drive list contains the logical drive ID, the size in megabytes of each logical drive, the RAID level you assigned to that logical drive, and the date you created it.

The status of the logical drive is also shown. **OKY** means that no problem conditions are associated with the drive; **CRT** means that you must replace the hard disk drive and rebuild the logical drive. (You will have received a message telling you what has happened to the drive.) **OFL** means that the logical drive is irrecoverable; the data in that drive is lost.

5. Locate the **Wrt pol** (Write Policy) field in the Logical Drive list.

The write policy is shown as either **WT** (write-through, which is the default setting) or **WB** (write-back).

6. Select the logical drive whose write policy you want to change.

**Attention:**

If you change the write policy to write-back, wait at least 10 seconds after your last operation before you power-off the server. It takes that long for the system to move the data from the cache memory to the storage device. Failure to follow this practice can result in lost data.

7. Press **Enter** to change the write policy.  
Notice that **WT** changes to **WB**. You can press **Enter** to alternate between **WT** and **WB**.
8. When you have made your choice, press **Esc** to return to the Advanced Functions menu.
9. Select **Exit**. The Confirm pop-up window appears asking you to confirm your action.
10. To return the setting to its original state, select **No**. To save your changes, select **Yes**.
11. Back up the disk-array configuration information to diskette. See "Backing Up The Disk-Array Configuration" on page 61 for more information.

## Formatting Drives

You can perform a low-level format on drives with **RDY** (Ready), **EMP** (Empty), **SBY** (Standby), **SHS** (Standby Hot-Spare), or **HSP** (Hot-spare) state.

**Note**

The **Format Drive** choice on the IBM RAID Subsystems Diagnostics menu provides a low-level format. If you install a new hard disk drive that requires a standard format, use the Format command provided by the operating system.

The ServeRAID configuration program provides the Format program so that you can perform a low-level format on a drive controlled by the ServeRAID adapter.

To perform a low-level format:

1. Start the ServeRAID configuration program (see "Starting the ServeRAID Configuration Program" on page 35).
2. Select **Advanced Functions** from the Main Menu.
3. Select **IBM RAID Subsystems Diagnostics** from the Advanced Functions menu.

**Attention**

A low-level format erases all data and programs from the hard disk drive. Before proceeding, back up any data and programs that you want to save.

4. Select **Format Drive**. The low-level format program starts.

- Follow the instructions on the screen.

You can perform a low-level format on one drive at a time.

### Note

If formatting is interrupted, the drive being formatted might display as an Empty state (- -) or blank in the Bay/Array selection list. Select the drive, and format it again.

## Changing the RAID Parameters

To change the RAID parameters:

- Start the ServeRAID configuration program (see “Starting the ServeRAID Configuration Program” on page 35).
- Select **Advanced Functions** from the Main Menu.
- Select **Change RAID Parameters**.

IBM PC ServeRAID Adapter Disk Array Configuration Ver. 1.XX  
 Adapter Number: 1 Bus Number: 0 Host ID = Null Config

Advanced Functions				Ch 1 Array Bay	Ch 2 Array Bay	Ch 3 Array Bay
1. Help				1 ONL A	1 ONL B	1 ONL C
2. Backup config. to Diskette				2 ONL A	2 ONL B	2 ONL C
3. Restore config. from Diskette				3 ONL A	3 ONL B	3 ONL C
4. Change Write Policy				4 ONL A	4 ONL B	4 ONL C
5. Change RAID Parameters				5 ONL A	5 DDD B	5 ONL C
6. IBM RAID Subsystem Diagnostics				6 ONL A	6 HSP B	6 ONL C
7. Init/View/Synchronize Config				7 RDY A	7 DHS B	7 TAP C
8. Display/Change Adapter Params				8	8	8
9. Exit				9 RBL B	9	9 SHS C
Stripe Unit Size BK	Rebuild Priority High	Unattended Off	Read Ahead On	10	10	10
1. 8K	1. Medium	1. On	1. On	11	11	11
2. 16K	2. High	2. Off	2. Off	12	12	12
3. 32K	3. Low			13	13	13
4. 64K				14	14	14
				15	15	15

Select a choice using the Up Arrow, (↓) Down Arrow, (←) Left Arrow (→) and Right Arrow (→) keys.  
 Press Enter to change parameter. Press Esc to return to main menu.

The default settings are:

- Stripe unit size — 8K

### Attention:

Once the stripe unit is chosen and data is stored in the logical drives, the stripe unit cannot be changed without destroying data in the logical drives.

The stripe unit size is the amount of data written on a given disk before writing on the next disk. To maximize the overall performance, choose the stripe unit such that the stripe-unit size is close to the size of the system I/O request. The default is set to 8 K data bytes.

**Note**

When the stripe unit size is 8 K or 16 K, the maximum number of drives in an array is 16. When the stripe unit size is 32 K or 64 K, the maximum number of drives in an array is 8.

- **Rebuild Priority — High**

Rebuild priority can be set to high, medium, or low. When the rebuild request is set to high, the rebuild I/O request gets high priority in the execution order.

When the rebuild request is set to medium in a heavily loaded system (with a medium rate of system I/O requests), the medium-priority rebuild can reduce the disk rebuild time at the expense of degraded handling of I/O requests.

When the rebuild priority is set to low, in a moderate to heavily loaded system, low rebuild priority will increase the disk rebuild time but provides better system performance.

**Note**

Rebuild priority can be changed without affecting data in the logical drives.

- **Unattended Mode — Off**

You can enable the adapter to accept changes in the configuration without user input. Unattended mode is useful when the server operates remotely. See “Unattended Mode of Operation” on page 67 for more information.

When Unattended Mode is On, and a hard disk drive is found in a location other than the one defined in the adapter configuration, the program pauses briefly for user input, then, automatically rearranges the configuration information to correct the logical drive configuration. Unattended mode also clears any blocked drives.

When Unattended Mode is Off, the program waits for user input.

- **Read ahead — On**

Normally, the ServeRAID adapter transfers data from disk to its local cache in steps of stripe-unit size. This provides excellent overall performance when workloads tend to be sequential. However, if the workload is random and system I/O requests are smaller than stripe-unit size, reading ahead to the end of the stripe unit will result in a wasted SCSI bus bandwidth and wasted disk utilization. When read-ahead is set to Off, the size of data transfer from the disk to local cache is equal to the system I/O

request size, and no read-ahead to the end of the stripe unit is performed.

#### Notes

1. The read-ahead setting can be changed without destroying data in a logical drive.
2. When the configuration is saved on a diskette, the RAID parameters are saved also.

## Unattended Mode of Operation:

You can enable the adapter to accept changes in the configuration without user input. When this mode is enabled (see “Changing the RAID Parameters” on page 65 for information), the adapter pauses briefly to permit a user to override the default action; then the adapter rearranges the configuration information. Unattended mode also clears any blocked logical drives. This mode is useful when the server operates remotely.

The adapter “chooses” an action that is equivalent to pressing one of the following function key:

**F5:** The server continues the startup operation after identifying the drive that is defunct. For example, an HSP drive failed to respond during POST. Startup continues without the HSP drive; its drive state will display as DHS.

**F6:** When a drive has been removed from the server, for example, for maintenance or security, and was returned, but in a different bay, the adapter adjusts the configuration to the drive's new location.

**F7:** An adapter with stored configuration information that does not match that of the configured drives present, imports the configuration information from the drives.

The ServeRAID adapter assigns the following priorities to the function keys:

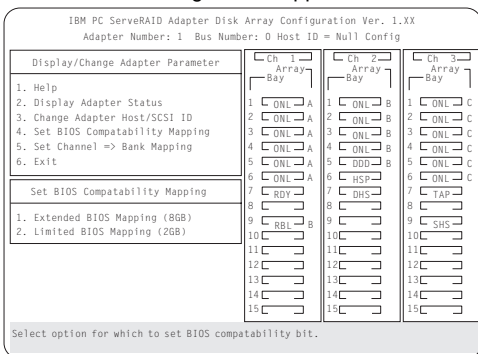
If this action/key is available	Priority of actions
F7	F7, F6, F5
F6	F6, F5
F5	F5

## Changing the ServeRAID Adapter Parameters

**Display/Change Adapter Parameters** allows you to view and change the adapter's configuration parameters.

To display or change the adapter parameters:

1. Start the ServeRAID configuration program (see “Starting the ServeRAID Configuration Program” on page 35).
2. Select **Advanced Functions** from the Main Menu.
3. Select **Display/Change Adapter Params** and press **Enter**. The following screen appears.



- **Display/Adapter Status** allows you to view the status of the adapter.
- **Change Adapter Host/SCSI ID** allows you to change the adapter SCSI ID and the SCSI transfer rate. You can also define the host configuration ID as any 12 characters. In addition, you can change the number of drives in a group that will startup simultaneously, and set the start-up delay in seconds between groups of drives.
- **Set BIOS Compatibility Mapping** allows you to set the BIOS mapping to 2 GB or 8 GB.
- **Set Channel => Bank Mapping** allows you to specify which bank is connected to each of the internal Channels on the ServeRAID adapter. The following table shows the default mapping.

Bank	Default connection
C	Channel 3
D	Channel 2
E	Channel 1

You can also specify the setting of the SCSI ID backplane jumper. This mapping is critical for the correct operation of the Administration and Monitoring program, which uses the settings to identify drives, control power to specific drives, and operate the SCSI LEDs.

For example, suppose you daisy-chained banks D and E, connecting the input connector on bank D to Channel 2 on the adapter. The SCSI ID backplane jumper on bank E is set to HI. Refer to the backplane information in the *PC Server Hardware Maintenance Manual* for the system

you are servicing. In this configuration, Channel 1 is available for external devices. Set the Bank Mapping as shown:

Channel	Low ID	High ID
Channel 1	External devices	External devices
Channel 2	D	E
Channel 3	C	

4. Follow the instructions on the screen.

## Using the Mini-Configuration Program

The Mini-Configuration program is a quick way to display the adapter settings, and to perform a limited set of the configuration functions without using the SCSI-2 Fast/Wide PCI-Bus Adapter Configuration Option Diskette.

To access the ServeRAID adapter Mini-Configuration program:

1. Power-on the server, or, if the system is on, press **Ctrl+Alt+Del**.
2. Press **Ctrl+I** immediately when the Mini-Configuration prompt appears on the screen.
3. Press **Enter**.

If you have more than one ServeRAID adapter installed, you will get an adapter selection screen; otherwise, the Main Menu appears.

- **View Adapter Status** displays the current status of the ServeRAID adapter. (See “Viewing the Adapter Status” for information.)
  - **View Configuration** shows the current configuration information for the ServeRAID adapter. (See “Viewing Configuration Information” on page 70 for information.)
  - **Advanced Functions** resets the adapter, initializes the configuration, and imports the configuration from drives. (See “Using Advanced Configuration Functions” on page 70 for information.)
4. Select a menu item, press the number of the item or use the Up Arrow (↑) key or Down Arrow (↓) key to highlight the item, then press **Enter**.
  5. Follow the instructions on the screen.
  6. Select **Exit** to leave the Main Menu.

## Viewing the Adapter Status:

The **View Adapter Status** choice allows you to view the status of the adapter's disk array.

The menu contains the following fields:

- **Unattend** displays the on/off state of Unattended Mode.



- **Boot Block Version** displays the current version number of the Boot Block.
- **Code Block Version** displays the current version number of the firmware on the adapter.
- **Rebuild Rate** displays the speed of rebuild. (See “Changing the RAID Parameters” on page 65.)
- **No. of DDD Drv.** displays the number of defunct drives.
- **No. of OFL Drv.** displays the number of offline logical drives.
- **No. of CRT Drv.** displays the number of critical logical drives.
- **Cfg. Updates** displays the number of times that the configuration has been updated.
- **Flash Pgms** displays the number of times that the firmware flash/EEPROM has been updated.
- **Logical Drive with Bad/Blocked Stripe** identifies any logical drive that has bad stripes, as well as logical drives that are in the blocked state.

## Viewing Configuration Information:

The **View Configuration** choice allows you to view the number and size of logical drives installed. It also displays the RAID level, current state, stripe size, write policy, read ahead status, and the creation date for each logical drive.

IBM PC ServeRAID Adapter Disk Array Mini-Configuration Ver. 1.XX

View Adapter Configuration Information  
No: 1 Bus: 0 Slot: 14

Logical Drive	Size (MB)	RAID Level	Current State	Stripe Size	Wrt Pol	Read Ahead	Date Created mm/dd/xx
0	100	5	OKY	8K	WT	NO	01/18/96
1	100	5	OKY	8K	WT	NO	01/18/96
2	100	5	OKY	8K	WT	NO	01/18/96
3	100	5	OKY	8K	WB	NO	01/18/96
4	100	5	OKY	8K	WB	NO	01/18/96
5	99	1	OKY	8K	WT	NO	01/18/96
6	200	5	OKY	8K	WT	NO	01/18/96
7	300	1	OKY	8K	WT	NO	01/18/96

Press any key to continue

## Using Advanced Configuration Functions:

The **Advanced Functions** choice allows you to reset the ServeRAID adapter, initialize the configuration, and import the configuration from drives.

- **Reset the Adapter** resets the adapter configuration values to the factory defaults.
- **Initialize Configuration** restores the factory default settings and sets all functional, connected hard disk drive states to the Ready (RDY) state.
- **Import Configuration from Drives** reads the configuration information from the drives and copies it

to NVRAM and the EEPROM modules on the adapter.

## ServeRAID Adapter Messages

The following information contains the ServeRAID diagnostic and run-time error messages that might appear during startup of a PC Server disk-array system.

The ServeRAID adapter contains a device-error table that collects statistics on the number and type of errors that occur on a selected hard disk drive. After correcting a problem with the disk array, you should clear the table so that you can identify any subsequent errors quickly. For more information, see “Obtaining Drive Status” on page 48.

All hard disk drives contain unique identifiers, such as the drive serial number and manufacturer. During configuration, the ServeRAID adapter stores this information.

The ServeRAID adapter also adds an additional unique identifier, called the host ID, to each hard disk drive that is part of a logical drive. The host ID is a user-defined 12-character string. (See “Changing the ServeRAID Adapter Parameters” on page 67 for information on assigning a host ID.)

## ServeRAID Adapter POST and Setup Messages:

During POST, the ServeRAID adapter compares the stored configuration information to the configuration that is actually present. If a discrepancy exists, one or more status messages appear after POST completes, but before the operating system loads. When the ServeRAID adapter requires your input, a list of function keys will appear below the message.

***New Drive Installed:*** When the ServeRAID adapter detects a new drive that is not part of the current configuration, the following message appears:

(old state: new state ch: bay)

This is an information message. No action is required.

**Configured Drives are Missing:** When the ServeRAID adapter detects that a previously configured drive is missing, the following message appears:

old state: new state: ch: bay

where *old state* is the configured state of the drive, *new state* is the state that the ServeRAID adapter will assign to the drive, *ch* and *bay* are the channel and bay where the drive was located previously.

Examples of the possible state changes include:

(ONL: DDD x: y)

(RDY: EMP x: y)

(SBY: EMP x: y)

(RBL: DDD x: y)

(HSP: DHS x: y)

(SHS: DHS x: y)

**Two choices will follow this message:**

**F4** Retry. Select this key after correcting a problem. For example, select retry after you turn on the external storage enclosure that contains the hard disk drive.

**F5** Select this key to accept the new state that the ServeRAID adapter will assign to the drive. For example, the adapter will assign the drive a state of defunct or empty.

You can also select F5 when you must remove a drive, RAID level 1 and RAID level 5 logical drives are present, and performance in a degraded mode is acceptable. The ServeRAID adapter will assign the drive a state of defunct, but the server can complete startup. However, the array will remain in Critical mode and the potential for data loss will exist until you replace and rebuild the defunct drive. To prevent the loss of data, replace and rebuild the defunct drive in a timely manner.

**Configured Drives Are Not in the Configured**

**Location:** When the ServeRAID adapter detects that a previously configured drive is present, but the drive is in a new location, the following message appears:

(old ch: old bay: > new ch: new bay)

where *old channel* is the channel that matches the existing drive configuration information, *old bay* is the bay that matches the existing drive configuration information, *new ch* is the channel where the drive is now located, and *new bay* is the bay where the drive is now located.

For example:

(1 :6 > 2:14)

(2 :5 > 2: 6)

In this example, the message indicates that the drive from Channel 1, Bay 6 is now located at Channel 2, Bay 14, and the drive from Channel 2, Bay 5 is now located at Channel 2, Bay 6. The drive might have been physically moved to the new bay.

**Three choices will follow this message:**

- F4**            Retry. Select this key after correcting a problem. For example, select retry after you move the hard disk drive to its previously assigned location.
- F5**            Select this key to accept the new state that the ServeRAID adapter will assign to the drive. For example, the adapter will assign the drive a state of defunct.
- F6**            Select this key to modify the configuration to match the current drive location.  
  
You might remove the hot-swap drives from the server for security reasons. If you replace the drives but install them in different bays, you can press **F6** to accept the new locations, and the ServeRAID adapter will update the configuration.

***New Adapter Installed in a Configured Server:***

When the ServeRAID adapter detects that the identifiers of the drives do not match the adapter configuration information, the following message appears:

```
host id: old ch: old bay: new ch:new bay
```

where *host ID* is the adapter identification, *old channel* is the channel that matches the drive configuration information, and *old bay* is the bay that matches the drive configuration information. *New ch* is the channel where the drive is now located, and *new bay* is the bay where the drive is now located.

For example:

```
(My Machine : 1:6 > 2:10)
```

In this example, the message indicates that the drive from Channel 1, Bay 6 is now located at Channel 2, Bay 10. The drive might have been physically moved to the new bay.

**Two choices will follow this message:**

- F4**            Retry. Select this key after correcting the problem. For example, select retry after you move the hard disk drive to its previously assigned location, or after you install the original ServeRAID adapter.
- F7**            Select this key to import the configuration information from the drive and to update the configuration information on the ServeRAID adapter. This choice is useful when you

replace the ServeRAID adapter in an existing disk-array model.

You also might select F7 if you replace a whole set of drives with drives that were configured in another server with a ServeRAID adapter.

**Note**

When you install drives in a server that has no logical drives defined, the F7 choice will not appear. This can occur when you replace the ServeRAID adapter itself. The adapter does not contain any logical drives in its factory configuration. Therefore, F7 will not appear. In this case, restart the server and press **Ctrl+I** to enter the Mini-Configuration (see “Using the Mini-Configuration Program” on page 69); then, select **Advanced Functions**. From that menu, select **Import Configuration from Drives to Adapter**.

## ServeRAID Adapter Status and Error Messages:

This table lists, in alphabetic order, messages associated with the IBM SCSI-2 Fast/Wide PCI-Bus RAID Adapter.

Where the “Action” information tells you to start the IBM ServeRAID configuration program, insert the RAID Adapter Option Diskette in the primary diskette drive (usually drive A); then, press **Ctrl+Alt+Del**. The action column also provides general information about the message.

Where *m* or *n* appears in these messages, a number will appear in the actual message.

RAID Adapter Message	Action
<i>n</i> logical drives are installed.	<i>n</i> represents the number of defined logical drives.  This is an information message. No action is required.
Controller is not responding to commands. No logical drives are installed.	The ServeRAID adapter is not operational.  Make sure that the adapter is fully seated. If the problem persists, have the system serviced.

RAID Adapter Message	Action
<p>Error: Cannot disable this adapter BIOS.</p>	<p>The adapter was unable to prevent an extra copy of the adapter BIOS from being stored on the server. This condition occurs when the server contains multiple ServeRAID adapters.</p> <p>When the prompt to disable extra copies of the adapter BIOS appears, type <b>N</b> (No).</p>
<p>Following drives not responding. (old state: new state ch: bay)</p>	<p>One or more drives did not respond to the adapter. For example, the adapter detected a new drive in an unconfigured bay, and the drive is not part of the current configuration. This might also occur if the adapter detected that a configured drive is missing.</p> <p>Select <b>F5</b> to accept the new state that the ServeRAID adapter will assign to the drive. For example, the adapter will assign the drive a state of defunct or empty.</p>
<p>Following new drives found. (old state: new state ch: bay)</p>	<p>One or more drives were found in an unconfigured bay. For each drive listed, a new state of Ready (RDY) appears.</p> <p>This is an information message. No action is required.</p>
<p>Following drives found in new location (old ch: old bay &gt; new ch: new bay)</p>	<p>POST found that the location of one or more drives does not match the stored configuration information. (See "Configured Drives Are Not in the Configured Location" on page 72 for more information.)</p>
<p>Installation stopped.</p>	<p>The server cannot access the ServeRAID adapter.</p> <p>This is a follow-on message to a preceding message. Follow the "Action" instructions for the preceding message to resolve the problem.</p>

RAID Adapter Message	Action
<p>Recoverable configuration error; run Configuration program.</p>	<p>The configuration data stored on the adapter NVRAM does not match the configuration data stored in the adapter EEPROM.</p> <p>Insert the IBM RAID Adapter Option Diskette; then, press <b>Ctrl+Alt+Del</b> to restart the system. Select <b>Advanced Functions</b> and synchronize the adapter configuration. See "Resetting the Adapter Configuration" on page 58 for more information.</p>
<p>ServeRAID firmware version xx.yy</p>	<p>This is the version level of the ServeRAID adapter's firmware.</p> <p>This is an information message. No action is required.</p>
<p>WARNING: <i>n</i> logical drives are critical; <i>n</i> logical drives are offline.</p>	<p>One or more drives have failed.</p> <p>Replace the defunct drives as soon as possible to prevent data loss.</p>
<p>The server has an error due to a Blocked Logical Drive.</p>	<p>One or more logical drives are in a blocked state.</p> <p>Press <b>F4</b> to unblock the logical drive, or press <b>F5</b> to continue without any changes.</p>

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