PS/ValuePoint   S61G-1423-01

**Hardware
Maintenance
Manual**

September 1993

**We Want Your Comments!
(Please see page 120)**

PS/ValuePoint

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Third Edition (September 1993)

Contents

About This Book

The IBM PS/ValuePoint (PS/VP) Hardware Maintenance Manual contains *both* service and reference information for IBM PS/ValuePoint computers.

- The service section of this manual includes procedures for isolating problems to a FRU, a Symptom-to-FRU Index, and a parts listing.
- The reference section of this manual includes safety information, general information, product description, and information about the diagnostic tests.

The manual should be used with the diagnostic tests (found on the Diagnostics diskette) to effectively troubleshoot problems.

Important

- This manual is intended for trained servicers who are familiar with PS/ValuePoint products.
- Before servicing a PS/ValuePoint product, review "Safety Information" on page 28.
- Refer to the following table to use the correct "Advanced Diagnostics" diskette for the computer you are servicing.

Diskette Type	PS/ValuePoint Model
Type 1	6384 and 6382 325T /S
Type 2	6382 /S, 6384 /D, 6387 /T
Type 3	6381
Type 4	6384 P60/D

The four diskettes are not interchangeable.

The term "Diagnostics diskette" used in this book applies to any of the four diskettes.

Hardware Maintenance Service

This section contains a general checkout and diagnostic test procedure, a Symptom-to-FRU Index, procedures for isolating problems to a FRU, and a parts catalog for IBM* PS/ValuePoint* (PS/VP) computers.

The diagnostic tests in this manual are intended to test *only* PS/ValuePoint products. Non-PS/ValuePoint products, prototype cards, or modified options can give false errors and invalid computer responses.

Warning: The drives in the computer you are servicing might have been rearranged or the drive startup sequence changed. Be extremely careful during write operations such as copying, saving, or formatting. Data or programs can be overwritten if you select an incorrect drive.

How to Diagnose Combined FRUs: If an adapter or device consists of more than one FRU, an error code might be caused by any of the FRUs. Before replacing the adapter or device, remove the FRUs, one by one, to see if the symptoms change.

Notes:

1. If you are instructed to replace the system board and that does not correct the problem, replace the riser card and reinstall the original system board.

2. If you are instructed to replace any other FRU and that does not correct the problem, reinstall that FRU before you continue.

How to Use Error Messages: Use the error messages displayed on the screen to diagnose failures. If more than one error message is displayed, diagnose the **first** error message. The cause of the first error message can cause false error messages to be displayed. If you did not receive any error messages, see if the error symptom is listed in the "Symptom-to-FRU Index" on page 12.

The general checkout procedure starts on the next page.

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1

General Checkout

001

– Power-off the computer and all external devices.
– Check all cables and power cords.
– Make sure there are no diskettes in the drives.
– Power-on all external devices.
– Power-on the computer.
– Watch the screen for a POST error message.
DID YOU RECEIVE A POST ERROR MESSAGE?
Yes No

> | 002 |
> |-----|
>
> Go to Step 008.

003

IS THE ERROR 162?
Yes No

> | 004 |
> |-----|
>
> Go to "Symptom-to-FRU Index" on page 12. If that
> does not solve the problem, go to Step 008.

005

**HAS THE CONFIGURATION BEEN INTENTIONALLY
CHANGED?**
Yes No

> | 006 |
> |-----|
>
> Go to Step 008.

007

Press **Enter** to run the Configuration Utility program and
verify that the error is no longer present. If you return to
this point again, go to Step 008.

008

If you are servicing a 6384 P60/D, go to "Diagnostics and
Test Information (6384 P60/D)" on page 61.
– Insert your diagnostics diskette.
– Press **Ctrl+Alt+Del**.
**DID THE COMPUTER BOOT FROM THE DIAGNOSTIC
DISKETTE AND DID THE IBM LOGO SCREEN
APPEAR?**
Yes No

> | 009 |
> |-----|
>
> (Step **009** continues)

009 (continued)
Go to "Symptom-to-FRU Index" on page 12.

010

– Press **Enter**.
– Select Test the system.
– Press **Enter**.

> **Note:** If you need to create a blank formatted diskette for this test, select FORMAT DISKETTE from the following screen.

– Press **Enter**, then go to Step 011.

011

DID THE "SELECT AN OPTION" MENU APPEAR?
Yes   No

> **012**
>
> **DID YOU RECEIVE A POST ERROR?**
> **Yes   No**
>
> > **013**
> >
> > Go to "Symptom-to-FRU Index" on page 12.
>
> **014**
>
> – Press **Esc**.
> **DID THE "SELECT AN OPTION" MENU APPEAR?**
> **Yes   No**
>
> > **015**
> >
> > Go to "Symptom-to-FRU Index" on page 12.
>
> **016**
>
> Go to Step 017.

017

Select SYSTEM CHECKOUT.
IS THE INSTALLED DEVICES LIST CORRECT?
Yes   No

> **018**
>
> Go to "Installed Devices List" on page 8. If that does not resolve the problem, continue with Step 020 on page 4.

019

(Step **019** continues)

019 (continued)
– Run the diagnostics tests.

- • If the test stops and you cannot continue, replace the last device tested.
- • If the computer has incorrect keyboard responses, go to "Keyboard" on page 9.
- • If the printer has incorrect responses, go to "Printer" on page 9.
- • If the display has problems such as jittering, rolling, shifting, or being out-of-focus, go to "Display" on page 7.

DID THE TESTS IDENTIFY A FAILURE?

Note: If the test stops and you cannot continue, replace the last device tested.

Yes No

> **020**
>
> Check the "Symptom-to-FRU Index" on page 12 for any POST error or other error symptom you might have. If your error symptom is not listed, go to "Undetermined Problem" on page 5. If you cannot find a problem, it might be intermittent:
>
> - • Check for damaged cables and connectors.
> - • Reseat all adapters, drives, and modules.
> - • Check the system unit fan for proper operation.
> - • Start an error log and run the tests multiple times. (Use a DOS-formatted diskette.)

021

Follow the instructions on the display. If that does not correct the problem, go to "Symptom-to-FRU Index" on page 12.

Undetermined Problem

Check the power supply voltages (see "Power Supply" on page 6). If the voltages are correct, return here and continue with the following steps:

1. Power-off the computer.
2. Remove or disconnect the following, one at a time:
   a. Non-IBM devices
   b. External devices (modem, printer, or mouse)
   c. Snap-in fan (6384 P60/D)
   d. Math coprocessor
   e. Overdrive processor
   f. Any adapters
   g. Riser card
   h. Memory module kits
   i. Hard disk drive
   j. Diskette drive
3. Power-on the computer.
4. Repeat steps 1 through 3 until you find the failing device or adapter.

If all devices and adapters have been removed, and the problem continues, replace the system board.

Power Supply

If the power-on indicator is not on or if the power-supply fan is not running, check the power cord for proper installation and continuity. Verify that the voltage-selector switch is set for the correct voltage.

If these are correct, check the voltages listed below.

Note: These voltages must be checked with the power supply cables connected to the system board.

REAR
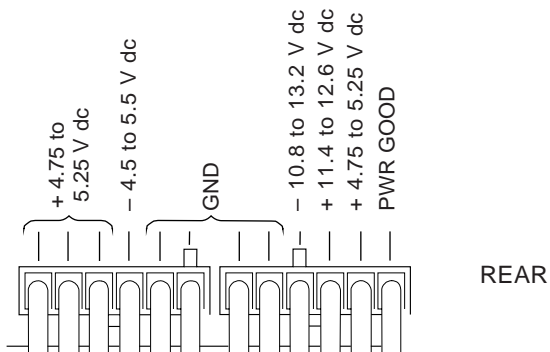
If the voltages are not correct, and the power cord is good, replace the power supply.

Display

If the screen is rolling, replace the display assembly. If that does not correct the problem, replace the system board.

If the screen is not rolling, do the following to run the display self-test:

1. Power-off the computer and display.
2. Disconnect the display signal cable.
3. Power-on the display.
4. Turn the brightness and contrast controls clockwise to their maximum setting.
5. Check for the following conditions:
   - You should be able to vary the screen intensity by adjusting the contrast and brightness controls.
   - The screen should be white or light gray, with a black margin (test margin) on the screen.

     Note: The location of the test margin varies with the type of display. The test margin might be on the top, bottom, or one or both sides.

   If you do not see any test margin on the screen, replace the display. If there is a test margin on the screen, replace the system board.

   Note: During the first two or three seconds after the display is powered on, the following might occur while the display synchronizes with the computer.
   - Unusual patterns or characters
   - Static, crackling, or clicking sounds
   - A "power-on hum" on larger displays

     A noticeable odor might occur on new displays or displays recently removed from storage.

     These sounds, display patterns, and odors are normal; do not replace any parts.

If you are unable to correct the problem, go to "Undetermined Problem" on page 5.

Installed Devices List

Warning: A customized setup configuration (other than default settings) might exist on the computer you are servicing. Running the Configuration Utility program might alter those settings. Note the current configuration settings and verify that the settings are in place when service is complete.

If the number of diskette drives shown in the installed devices list is not correct, do the following:

1. Restart the computer.
2. Run the Configuration Utility program to correct the drive information.
3. Run the diagnostic tests.

If you cannot correct the drive information, replace FRUs, in the following order, until the problem goes away:

- Diskette drive
- Diskette-drive cable
- System board

If the number of hard disk drives shown in the installed devices list is not correct, do the following:

1. Check the hard disk drive jumper settings (see "Hard Disk Drive Jumper Settings" on page 68).
2. Check the voltages to the hard disk drives (see "Power Supply" on page 6).
3. Restart the computer and check the configuration.
    - If the first drive is missing, replace the primary drive.
    - If all drives are missing, replace the primary drive.
    - If just the second drive is missing, replace that drive.

    If the problem remains, replace the drive cable. If that does not fix the problem, replace the system board.

If any other adapter or device is missing from the installed devices list, run the Configuration Utility program. Check to see if any adapter or device is set to a conflicting address with any other adapter or device. Also be sure that any adapter or device missing from the list is not set to "disabled".

Note: If you cannot add a missing adapter or device to the list, the diagnostic code for the missing adapter or device is not on the diagnostic diskette. Run the diagnostics provided with that device.

Keyboard

Note: If a mouse or other pointing device is attached, remove it to see if the error symptom goes away. If the symptom goes away, the mouse or pointing device is defective.

| 001 |

– Power-off the computer.
– Disconnect the keyboard cable from the system unit.
– Power-on the computer and check the keyboard cable connector on the system unit for the voltages shown. All voltages are ± 5%.

Pin	Voltage (Vdc)
1	+5.0
2	Not Used
3	Ground
4	+5.0
5	+5.0
6	Not Used
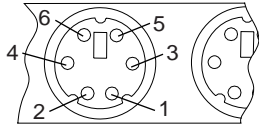
ARE THE VOLTAGES CORRECT?
Yes   No

| 002 |

Replace the system board.

| 003 |

On keyboards with a detachable cable, replace the cable. If the problem remains or if the cable is permanently attached to the keyboard, replace the keyboard. If the problem remains, replace the system board.

Printer

1. Make sure the printer is properly connected and powered on.
2. Run the printer self-test.

If the printer self-test does not run correctly, the problem is in the printer. Refer to the printer service manual.

If the printer self-test runs correctly, install a wrap plug in the parallel port and run the diagnostic tests to determine which FRU failed.

If the diagnostic tests (with the wrap plug installed) do not detect a failure, replace the printer cable. If that does not correct the problem, replace the system board or adapter connected to the printer cable.

Memory

001

– Power-off the computer.
– Insert the diagnostics diskette into drive A.
– Power-on the computer.
– Make a note of any POST errors you receive. Disregard
  164 errors (memory size).

**DID YOU RECEIVE A XXXXXX XXXX 2XX POST
ERROR?**
Yes No

> | 002 |
> |-----|
>
> **DID THE COMPUTER BOOT FROM THE
> DIAGNOSTIC DISKETTE AND DID THE IBM
> LOGO SCREEN APPEAR?**
> **Yes No**
>
> > | 003 |
> > |-----|
> >
> > You might have to press **Esc** to continue.
> > – Run the memory tests. Use the **RUN
> >   TESTS ONE TIME** option.
> > – Continue with the question in Step 004.
> > – or –
> > If the computer did not boot from the
> > diagnostic diskette with the IBM logo screen
> > displayed, go to "Symptom-to-FRU Index" on
> > page 12.
>
> | 004 |
> |-----|
>
> Press **Enter** to continue.
> – Run the memory tests. Use the **RUN TESTS
>   ONE TIME** option.
>
> **DID THE MEMORY TESTS FINISH WITHOUT AN
> ERROR?**
> **Yes No**
>
> > | 005 |
> > |-----|
> >
> > Follow the instructions on the display.
>
> | 006 |
> |-----|
>
> Your computer memory is now functioning correctly.
> If you suspect an intermittent problem, start an error
> log. (Use a DOS-formatted diskette.)

007

(Step **007** continues)

007 (continued)

Press **Esc** to continue.

– Run the memory tests. Use the **RUN TESTS ONE TIME** option. If you cannot run the memory test or the test does not find a problem, replace the memory module kits, one at a time, until the problem goes away. Refer to "Computer Memory" on page 49. When the problem goes away, replace the last kit removed. If that does not fix the problem, replace the system board.

Symptom-to-FRU Index

The Symptom-to-FRU Index lists error symptoms and possible causes. The most likely cause is listed first. Always begin with "General Checkout" on page 2. This index can also be used to help you decide which FRUs to have available when servicing a computer. If you are unable to correct the problem using this index, go to "Undetermined Problem" on page 5.

Notes:

1. If you have both an error message and an incorrect audio response, diagnose the error message first.
2. If you cannot run the diagnostic tests, but did receive a POST error message, diagnose the POST error message.
3. If you did not receive any error message, look for a description of your error symptoms in the first part of this index.
4. Check all power supply voltages before you replace the system board. (See "Power Supply" on page 6.)
5. Check the hard disk drive jumper settings before you replace a hard disk drive. (See "Hard Disk Drive Jumper Settings Checkout" on page 51.)

Important

- For the 6381, some errors are indicated with a series of beep codes (see "Model 6381 Beep Code Index" on page 17).
- The 6384 P60/D uses the same POST error codes as other PS/ValuePoint computers; however, it uses unique diagnostic numeric error codes. In the following Symptom-to-FRU Index, all 6384 P60/D diagnostic numeric error codes include the message "(6384 P60/D only)."
- For the 6384 /D, if a SoundBlaster card is installed, beeps operate through the SoundBlaster card. If a "No Beep" error occurs, remove the SoundBlaster card and power-on the computer. If normal beeps occur, replace the SoundBlaster card.

In the following index, an "X" in an error message can represent any number.

Symptom/Error	FRU/Action
No power, or fan not running	**See "Power Supply" on page 6.**
No beep during POST but computer works correctly	**System Board**
No beep during POST	**See "Undetermined Problem" on page 5.** System Board Memory Module Kit Any Adapter or Device Riser Card Power Cord Power Supply
One long and two short beeps during POST	**System Board**
Three short beeps during POST	**See "Memory" on page 10.** System Board
Continuous beep	**System Board**
Repeating short beeps	**Keyboard (stuck key?)** Keyboard Cable System Board
Changing colors	**Display**
Intensity or color varies from left to right of characters and color bars	**Display** System Board
Other display problem not listed above (including blank or illegible display)	**See "Display" on page 7.** System Board Display
Power-on indicator or hard disk drive in-use light not on, but computer works correctly	**Power Supply** System Board
Diskette drive in-use light remains on or does not light when drive is active	**Diskette Drive** System Board Diskette Drive Cable
The "Insert a Diskette" icon appears with a known-good diagnostics diskette in the first 3.5-inch diskette drive	**Diskette Drive** System Board Diskette Drive Cable Network Adapter
Program loads from the hard disk with a known-good diagnostics diskette in the first 3.5-inch diskette drive	**Check Configuration Utility** Diskette Drive System Board Power Supply
A nonsystem disk or disk error-type message with a known-good diagnostic diskette	**Diskette Drive** System Board Diskette Drive Cable

Symptom/Error	FRU/Action
Cannot read a 5.25-inch diskette	**The button on the PS/VP 5.25-inch diskette drive bezel must be pressed after inserting a diskette.**
Incorrect memory size during POST	**See "Memory" on page 10.** System Board
Printer problems	**See "Printer" on page 9.**
Serial or parallel port device failure (system board port)	**Device Self-Test OK?** Device Cable System Board
Serial or parallel port device failure (adapter port)	**Device Self-Test OK?** Device Cable Alternate Adapter System Board Riser Card
Some or all keys on the keyboard do not work	**Keyboard** Keyboard Cable System Board
Clock Battery inaccurate	**Clock Battery** System Board
XXXX ROM Error	**Any Adapter**
000XXXXX (6384 P60/D only)	**Diagnostic Diskette**
002XXXXX (6384 P60/D only)	**Keyboard**
003XXXXX (6384 P60/D only)	**Diskette Drive** System Board
004XXXXX (6384 P60/D only)	**Memory Module Kit** (Remove memory module kits one at a time. When the problem goes away, replace the last memory module kit removed.)
005XXXXX (6384 P60/D only)	**Real Time Clock**
007XXXXX (6384 P60/D only)	**Hard Disk Drive** System Board
008XXXXX (6384 P60/D only)	**System Board** (Serial port)
009XXXXX (6384 P60/D only)	**System Board** (Parallel port)
011XXXXX (6384 P60/D only)	**System Board** (DMA)
015XXXXX (6384 P60/D only)	**Miscellaneous** (Replace FRU indicated by text message on screen)
01EXXXXX (6384 P60/D only)	**System Board** (Pentium Processor)

Symptom/Error	FRU/Action
02BXXXXX (6384 P60/D only)	**System Board** (Video controller)
02CXXXXX (6384 P60/D only)	**System Board** (FLASH EEPROM)
029XXXXX (6384 P60/D only)	**System Board** (Video controller)
110	**Follow screen instructions** Memory Module Kit System Board
161	**Run Configuration Utility** Clock Battery System Board
162 (and unable to run diagnostics)	**Diskette Drive** System Board Diskette Drive Cable
162	**Run Configuration Utility** Clock Battery System Board
163	**Time and Date Set?** Clock Battery System Board
164	**Run Configuration Utility** See "Memory" on page 10. System Board
199	**See "Installed Devices List" on page 8.**
1XX (not listed above)	**System Board**
225	**Unsupported Memory**
2XX or **XXXXXX XXXX 2XX**	**See "Memory" on page 10.** Memory Module Kit System Board
305 (The system-board nonreplaceable fuse can be blown by a defective keyboard or mouse. If you suspect one of these FRUs, replace it when you replace the system board.)	**System Board** Keyboard Keyboard Cable Mouse
3XX (not listed above)	**Keyboard** Keyboard Cable System Board
604 or **662**	**Wrong diskette drive type**
663	**Wrong media type**
6XX (not listed above)	**Diskette Drive** System Board External Drive Adapter Diskette Drive Cable Power Supply

Symptom/Error	FRU/Action
7XX	**Math Coprocessor** System Board
9XX	**System Board**
1047	**16-bit AT SCSI Fast Adapter**
10XX (not listed above)	**Alternate Parallel Adapter** Riser Card
11XX	**System Board**
12XX	**Alternate Serial Adapter** Riser Card
13XX (A properly functioning joystick or paddle must be attached)	**Game Control Adapter** Riser Card
14XX	**See "Printer" on page 9.**
15XX	**SDLC Communications Adapter** Riser Card
17XX	**See "Power Supply" on page 6.** Hard Disk Drive System Board Hard Disk Cable Power Supply
209X	**Diskette Drive** Diskette Cable 16-bit AT SCSI Fast Adapter
20XX (not listed above)	**BSC Adapter** Riser Card
21XX	**SCSI Device** 16-bit AT SCSI Fast Adapter Alternate BSC Adapter Riser Card
2401, **2402**	**System Board** Display
2409	**Display**
2410	**System Board**
30XX	**PC Network Adapter** LF Translator Cable Problem? Riser Card
31XX	**Alternate PC Network Adapter** LF Translator Cable Problem? Riser Card
86XX	**Mouse** System Board

Symptom/Error	FRU/Action
12902	**Run Diagnostics** System Board
12904	**Run Diagnostics** L2 Cache Adapter
I**99903**01 (Hard disk reset failure)	**Possible hard** **disk drive problem**
I**99903**05 (No startable device found)	**Restart computer from** **diskette or check for valid** **startup sequence** System Board
I**999XX**XX (not listed above) (There is an optional SCSI adapter installed)	**SCSI Hard Disk Drive** SCSI Adapter SCSI Cable

Model 6381 Beep Code Index

> ─── **Important** ───
>
> In the following Beep Code Index, the numbers
> indicate the sequence and number of beeps. For
> instance, a "2-3-2" error symptom (a burst of two
> beeps, three beeps, then a burst of two beeps)
> indicates a memory module kit problem. (See
> "Symptom-to-FRU Index" on page 12 for other
> beep/no-beep symptoms.)

Beep Code	FRU/Action
1-3-1, 1-3-2	**Memory Module Kit** System Board
1-4-4	**Keyboard** System Board
2-1-1, 2-1-2	**Run Setup** System Board
2-2-2	**Video Card** System Board
2-3-2	**Memory Module Kit** System Board
2-4-3, 2-4-4	**Run Setup** Memory Module Kit System Board
All other beep code **sequences**	**System Board**

Type 6381, 6382 /S Parts
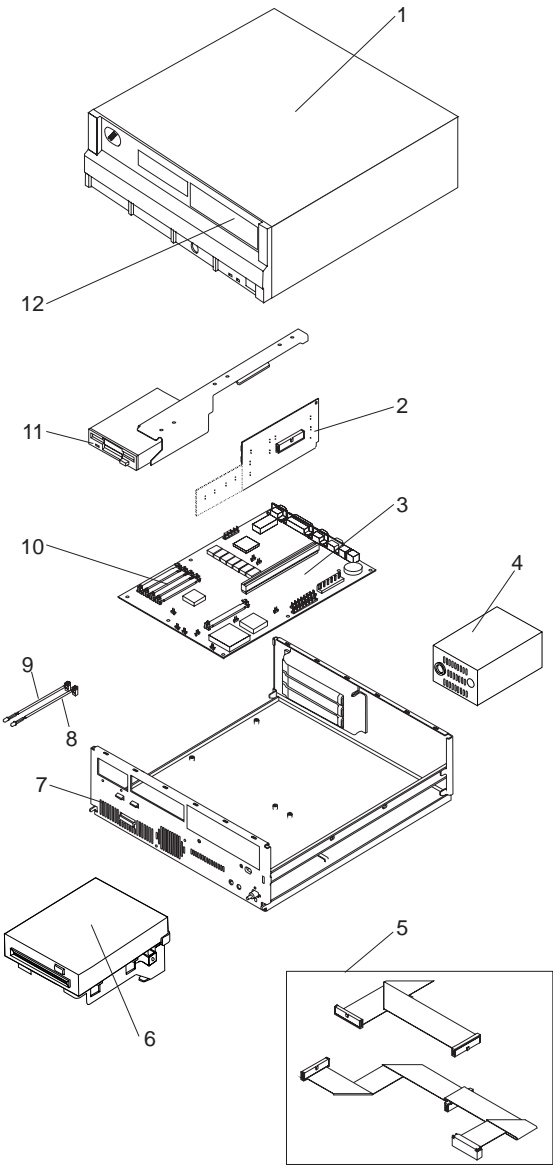
Type 6384, 6384 /D, 6384 P60/D Parts

Type 6387 /T Parts

1

17

4

8

7

9

13

11

3

14

12

15

5

16

10

2
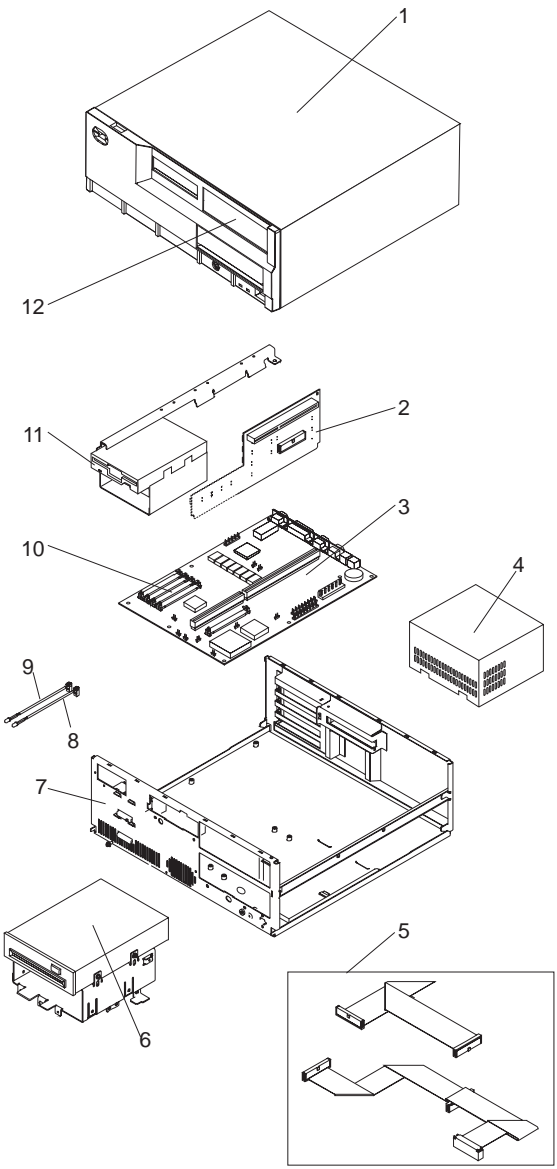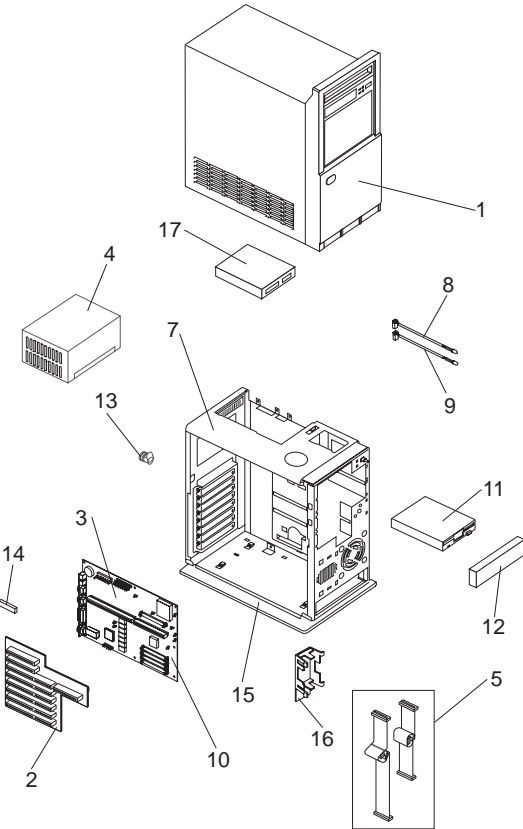
Parts Listing

Note: Not all parts in this listing apply to all countries.

Index	System Unit	
1	Top Cover Assembly (6381, 6382 /S)	92F0414
1	Top Cover Assembly (6384, 6384 P60/D)	52G8740
1	Top Cover Assembly (6384 /D)	92F0410
1	Top Cover Assembly (6387 /T)	61G2169
	Logo	52G8743
	Power Button (6381, 6384 P60/D)	61G3204
	Power Button (6387 /T)	61G3205
	Front Bezel w/ labels (6381, 6382 /S)	92F0417
	Front Bezel w/ labels (6384)	52G8742
	Front Bezel w/ labels (6384 /D, 6384 P60/D)	92F0413
	Front Bezel w/ labels (6387 /T)	61G2170
	Foot (4)	93F2386
2	Riser Card (6381)	52G7065
2	Riser Card (6382 /S)	92F0391
2	Riser Card (6382 (386SLC only))	93F2393
2	Riser Card (6384)	93F2396
2	Riser Card (6384 /D)	92F0392
2	Riser Card (6384 P60/D)	71G2782
2	Riser Card (6387 /T)	92F0393
	Riser Card Support Clip (6387 /T)	61G2365
	Power Graph X-24 Adapter	60G9697
3	**System Boards (6381)** (no memory)	
	425SX/Si (486SX 25MHz)	52G7023
	433SX/Si (486SX 33MHz)	52G7022
	433DX/Si (486DX 33MHz)	52G7017
	450DX2/Si (486DX2 25/50MHz)	65G8626
	466DX2/Si (486DX2 33/66MHz)	52G7016
3	**System Boards (6382 /S)** (no memory)	
	325T/S (386SLC 25MHz, **2MB**)	52G8751
	425SX/S (486SX 25MHz) (Type 1)	92F0394
	425SX/S (486SX 25MHz) (Type 2)	61G3215
	433SX/S (486SX 33MHz) (Type 1)	92F0388
	433SX/S (486SX 33MHz) (Type 2)	61G2205
	433DX/S (486DX 33MHz) (Type 1)	92F0396
	433DX/S (486DX 33MHz) (Type 2)	71G3154
	466DX2/S (486DX2 33/66MHz)	71G3161
3	**System Boards (6384)** (no memory)	
	325T (386SLC 25MHz, **2MB**)	52G8751
	425SX (486SX 25MHz)	60G9713
	433DX (486DX 33MHz)	60G9712
	466DX2 (486DX2 33/66MHz)	60G9711
3	**System Boards (6384 /D)** (no memory)	
	425SX/D (486SX 25MHz) (Type 1)	92F0394
	425SX/D (486SX 25MHz) (Type 2)	61G3215
	433SX/D (486SX 33MHz) (Type 1)	92F0388
	433SX/D (486SX 33MHz) (Type 2)	61G2205
	433DX/D (486DX 33MHz) (Type 1)	92F0396
	433DX/D (486DX 33MHz) (Type 2)	71G3154
	450DX2/D (486DX2 25/50MHz)	71G6462
	466DX2/D (486DX2 33/66MHz)	71G3161
	P60/D (Pentium 60MHz)	71G3232
3	**System Boards (6387 /T)** (no memory)	
	433DX/T (486DX 33MHz) (Type 1)	92F0396
	433DX/T (486DX 33MHz) (Type 2)	71G3154
	450DX2/T (486DX2 25/50MHz)	71G6462
	466DX2/T (486DX2 33/66MHz)	61G3181
	(Models WXX only)	

Index	System Unit	
	Snap-in Fan Assembly (6384 P60/D)	71G6619
	Lithium Battery - CR2032	33F8354
	Lithium Battery (6384 P60/D)	71G6630
	L2 Cache 128KB	92F0397
	L2 Cache 128KB (6381, 6384 P60/D)	73G3139
	L2 Cache 128KB (6387 /T)	92F0399
	L2 Cache 256KB	92F0398
	L2 Cache 256KB (6381, 6384 P60/D)	73G3231
	L2 Cache 256KB (6387 /T)	92F0400
	Video DRAM, 512KB (6381)	73G3138
	Video DRAM, 1MB (6384 P60/D)	73G3236
	Video DRAM, 1MB (All other models)	60G2951
	Jumper, 2 position - 4 pack	93F0067
	EMC Clips - 6 pack	92F0420
4	100 W Power Supply (6382 /S)	92F0415
4	145 W Power Supply (6384)	52G8741
4	200 W Pwr Supply (6381, 6384 /D, 6387 /T)	92F0411
5	Diskette Drive Cable (6381, 6384)	52G8748
5	Diskette Drive Cable (6382 /S, 6384 /D, 6387)	92F0423
5	Hard Dsk Drv Cable (6381, 6382 /S, 6384 /D)	92F0424
5	Hard Disk Drive Cable (6384)	52G8749
5	Hard Disk Drive Cable (6387 /T)	92F0424
7	Base Frame Assembly (6381, 6382 /S) (R)	92F0416
7	Base Frame Assembly (6384) (R)	52G8750
7	Base Frame Assembly (6384 /D) (R)	92F0412
7	Base Frame Assembly (6387 /T)	92F0422
	Adapter Card Guides (2)	52G8746
	Adapter Card Guide (6384 P60/D)	82G1745
	Speaker	92F0421
8	LED and Cable, Power	93F2389
9	LED and Cable, Hard Disk Drive	93F2388
10	30-Pin Memory Module, 1MB	93F0058
	30-Pin Memory Module, 4MB	96F9289
	72-Pin Memory Module, 1MB (80 ns)	90X8624
	72-Pin Memory Module, 2MB (70 ns)	92F0102
	72-Pin Memory Module, 2MB (70 ns) (6381)	73G3232
	72-Pin Memory Module, 2MB (80 ns)	92F0103
	72-Pin Memory Module, 4MB (70 ns)	92F0105
	72-Pin Memory Module, 4MB (6384 P60/D)	73G3233
	72-Pin Memory Module, 4MB (80 ns)	92F3337
	72-Pin Memory Module, 8MB (70 ns)	64F3606
	72-Pin Memory Module, 8MB (70 ns) (6381)	73G3234
	72-Pin Memory Module, 8MB (80 ns)	64F3607
	72-Pin Memory Module, 8MB (6384 P60/D)	73G3234
	72-Pin Memory Module, 16MB (80 ns)	60G2950
	72-Pin Memory Module, 32MB (6384 P60/D)	73G3235
	Cover Lock w/ pawl	52G8744
13	Cover Lock w/ pawl (6387 /T)	61G2177
14	Riser Card Support Clip (6387 /T)	61G2365
15	Base Stand (6387 /T)	61G2174
16	Adapter Card Guide (6387 /T)	61G2173

Index	DASD	
6	5.25-in. 1.2MB Diskette Drive (optional)	93F2362
11	3.5-in. 1.44MB Diskette Drive	93F2361
	3.5-in. Blank Drive Bezel	92F0419
	3.5-in. Diskette Drive Bezel (6387 /T)	61G2172
	3.5-in. Tray / Riser Support (6381, 6382 /S)	61G2175
	3.5-in. Tray / Riser Support (6384, 6384 /D, 6384 P60/D)	71G6112
	3.5-in. Tray and Riser Support (6387 /T)	93F2387
	Mounting Screws (4)	93F0041
12	5.25-in. Blank Bezel	52G8745
12	Blank Drive Bezel (6387 /T)	61G2171
	5.25-in. Tray (6381, 6382/S)	71G6111
	5.25-in. Tray (6384, 6384/D, 6384 P60/D)	71G6113
	5.25-in. Tray (6387 /T)	61G3207
	5.25-in. to 3.5-in. Tray Conversion Kit	70G8165
17	80MB Hard Disk Drive	95F4721
17	120MB Hard Disk Drive	92F0256
17	170MB Hard Disk Drive	95F4728
17	170MB Hard Disk Drive (6381, 6382 /S, 6384 /D, 6387 /T)	71G4958
17	212MB Hard Disk Drive	93F0118
17	212MB Hard Disk Drive (6381, 6384 P60/D)	71G4874
17	245MB Hard Disk Drive	92F0403
17	340MB Hard Disk Drive	92F0404
17	420MB Hard Disk Drive (6384 P60/D)	71G4930
17	527MB Hard Disk Drive	82G3300
	16-Bit AT SCSI Fast Adapter (option)	92F0330

Multimedia

SoundBlaster 16 Card	71G2924
SoundBlaster 16 Audio/Data Cable	71G2925
CD ROM Drive	61G4109
Low Cost CD ROM Drive	61G1901
Internal Adapter	61G4110
Data Cable	61G4111
Audio Cable	61G4112
3.5-in Enhanced Rewritable Optical Drive	92F0167
Mounting Bracket and Screws	32G2963
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Communication Adapters

Ethernet Adapter (twisted pair)	92F0386
Ethernet Adapter (coaxial)	92F0387
Token Ring Adapter	03F0212

Keyboard Cable and Mouse

Keyboard Cable Assembly 0.9 m (3 ft.)	61X8898
Keyboard Parts Kit	33F8174
Mouse	33G5420
Mouse (6381, 6384 P60/D)	96F9258
— Mouse Ball and Pop-Off Retainer	33F8461
— Mouse Ball and Twist-Off Retainer	33F8462
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Keyboards

Arabic	1391490
Belgian	1391414
Belgian/French	1391526
Brazil (6381, 6384 P60/D)	61G3976
Bulgarian	1399583
Canadian French	1392022
Canadian French (attached cable)	92F0334
Czechoslovakian	1399570
Cyrillic	1393866
Danish	1391407
Dutch	1391511
Finnish/Swedish	1391411
French	1391402
German	1391403
Greek	1399046
Hebrew	1391408
Hungarian	1399581
Italian	1393395
Latin-American Spanish	1392025
Latin-American Spanish (attached cable)	92F0333
Latin-American Spanish (6381, 6384 P60/D)	61G3976
Norwegian	1391409
Polish	1399580
Portuguese	1391410
Portuguese (6381, 6384 P60/D)	61G3976
Romanian	1399582
Russian/Cyrillic	1399579
Serbian/Cyrillic	1399578
Slovakian	1399571
Spanish	1391405
Swedish/Finnish	1391411
Swiss	1391412
Swiss/French	1395881
Swiss/German	1395882
Turkish	1393286
U.K. English	1391406
U.S. English	1392090
U.S. English (attached cable)	92F0332
U.S. English (E/ME/A only)	1396790
Yugoslavian	1393669

Displays

6312 Color Display

90/137 V ac (U.S. and Canada)	39G3321
180/264 V ac (Northern Hemisphere)	39G3322
180/264 V ac (Equatorial)	39G3323
180/264 V ac (Southern Hemisphere)	39G3494
Tilt/Swivel Stand	39G3496

6314 Color Display

98/264 V ac (U.S. and Canada)	39G3352
98/264 V ac (Northern Hemisphere)	39G3353
98/264 V ac (Equatorial)	39G3454
98/264 V ac (Southern Hemisphere)	39G3498
Tilt/Swivel Stand	39G3502
Signal Cable	39G3331

6317 Color Display

98/264 V ac (U.S. and Canada)	39G3359
98/264 V ac (Northern Hemisphere)	39G3360
98/264 V ac (Southern Hemisphere)	39G3361

6319 Color Display

98/264 V ac (U.S. and Canada)	39G3385
98/264 V ac (Northern Hemisphere)	39G3386
98/264 V ac (Equatorial)	39G3387
98/264 V ac (Southern Hemisphere)	39G3500
Tilt/Swivel Stand	39G3503
Signal Cable	39G3331

6324 Color Display

98/264 V ac (U.S. and Canada)	68G1356
ITC Assembly for 68G1356	68G1419
Card Tray Assembly for 68G1356	39G6257

6325 Color Display

98/264 V ac (U.S. and Canada)	68G1443
ITC Assembly for 68G1443	39G6292
Card Tray Assembly for 68G1443	68G1321

6327 Color Display

98/264 V ac (U.S. and Canada)	39G3362
ITC Assembly for 39G3362	72G8486
Card Tray Assembly for 39G3362	72G8489

Power Cords

Arabic Countries	14F0033
Australia	93F2365
Belgium	13F9979
Bulgaria	13F9979
Canada	93F2364
Czechoslovakia	13F9979
Denmark	13F9997
Finland	13F9979
France	13F9979
Germany	13F9979
Hungary	13F9979
Israel	14F0087
Italy	14F0069
Latin-America	93F2366
Netherlands	13F9979
New Zealand	93F2365
Norway	13F9979
Poland	13F9979
Portugal	13F9979
Serbia	13F9979
Slovakia	13F9979
South Africa	14F0015
Spain	13F9979
Switzerland	13F9979
Switzerland (French, German)	14F0051
U.S.	93F2364
UK, Ireland	14F0033
Yugoslavia	13F9979

Display Power Cord   38F3908

Special Tools

The following special tools are required to service these computers:

- A meter similar to the Triplett** Model 310 (IBM P/N 9900167)
- Wrap Plug, IBM P/N 72X8546

** Trademark of the Triplett Corporation

Hardware Maintenance Reference

This section contains general product and diagnostic information and covers the following:

Moving the Computer

The PS/ValuePoint computer top-cover assembly slides onto the base frame and is held in place by the cover-release latch (or latches) and cover lock. Before moving the computer, make sure that the cover is latched and the cover lock is in the locked position.

6382/S, 6384/D, 6387/T System Boards

> **Important**
>
> 6382 /S, 6384 /D, and 6387 /T Type 2 system boards are longer than type 1 system boards. When replacing a system board, replace type 1 only with type 1 and type 2 only with type 2.

Safety Information

The following section contains the safety information required to service a PS/ValuePoint computer. Familiarize yourself with this information before servicing a PS/ValuePoint computer.

General Safety

Use these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during maintenance and after completing it.
- When lifting any heavy object:
  1. Ensure you can stand safely without slipping.
  2. Distribute the weight of the object equally between your feet.
  3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
  4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb) or objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer or that makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- Put removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case away from walk areas so that other people will not trip over it; for example, put it under a desk or table.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside other clothing or fasten the necktie with a clip, preferably nonconductive, approximately 8 cm (3 in.) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.

  Remember: Metal objects are excellent conductors.
- Wear safety glasses when you are:
  - Using a hammer to drive pins or similar parts
  - Drilling with a power hand-drill
  - Using spring hooks or attaching springs
  - Soldering parts
  - Cutting wire or removing steel bands
  - Cleaning parts with solvents, chemicals, or cleaning fluids

- Working in any other conditions that might be hazardous to your eyes.
- After maintenance, reinstall all safety devices such as shields, guards, labels, and ground wires. Exchange any safety device that is worn or defective for a new one.

  Remember: Safety devices protect personnel from hazards. You destroy the purpose of the devices if you do not reinstall them before completing your service call.
- Reinstall all covers correctly before returning the machine to the customer.

Safety Inspection Guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of non-IBM features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power: primary voltage on the frame can cause serious or fatal electrical shock.
- Explosive hazards, such as a damaged CRT face or bulging capacitor, can cause serious injury.
- Mechanical hazards, such as loose or missing hardware, can cause serious injury.

The guide consists of a series of steps presented in a checklist. Begin the checks with the power-off and the power cord removed from the power receptacle.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the computer. Disconnect the power cord from the electrical outlet.
3. Check the power cord for:
   a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
   b. Insulation must not be frayed or worn.
4. Remove the cover.

5. Check for any obvious non-IBM alterations. Use good judgment as to the safety of any non-IBM alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Changing the Battery

Follow any special handling and installation instructions supplied with the replacement battery.

CAUTION:
A danger of explosion exists if battery is incorrectly replaced.

Replace with only the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Handling Electrostatic Discharge (ESD) Sensitive Devices

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

Notes:

1. Use product-specific ESD procedures when they exceed the requirements noted here.

2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

Note: The use of a grounding system is desirable but not required to protect against ESD damage.

– Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
– Use an ESD common ground or reference point when working on a double-insulated or battery-operated computer. You can use coax or connector-outside shells on these computers.
– Use the round ground-prong of the AC plug on AC-operated computer.

Electrical Safety

Observe the following rules when working on electrical equipment:

- Find the room emergency power-off (EPO) switch or disconnecting switch. If an electrical accident occurs, you can then operate the switch quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power:
  – Before doing a mechanical inspection
  – Before working near power supplies
  – Before removing or installing main units
- Before you start to work on the machine, unplug its power cable. If you cannot unplug the cable, ask the customer to switch off the wall box that supplies power to the machine and to lock the wall box in the off position.
- If you need to work on a machine that has *exposed* electrical circuits, observe the following precautions:
  – Ensure that another person, familiar with the power-off controls, is near you.

    Remember: Another person must be there to switch off the power, if necessary.

    CAUTION:
    Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents. Use only approved tools and testers.

  – Use only one hand when working with powered on electrical equipment; keep the other hand in your pocket or behind your back.

    Remember: There must be a complete circuit to cause electrical shock. By observing the above rule, you might prevent a current from passing through your body.

  – When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.

CAUTION:
Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been switched off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts *with the power on* when they are removed from their normal operating places in a machine:
    - Power supply units
    - Pumps
    - Blowers and fans
    - Motor generators

    and similar units. (This practice ensures correct grounding of the units.)
- If an electrical accident occurs:
    - **Use caution; do not become a victim yourself.**
    - **Switch off power.**
    - **Send another person to get medical aid.**

Product Description

PS/ValuePoint Type 6381 and 6382 /S computers contain three drive bays and three I/O adapter card slots. PS/ValuePoint Type 6384, 6384 /D, and 6384 P60/D computers contain five drive bays and five I/O adapter card slots. Type 6387 /T computers contain six drive bays and eight I/O adapter card slots.

- **Security**
  - Power-on password
- **System Board (Type 6381 SX)**
  - 8KB internal cache, no external cache
  - 4MB RAM pre-installed on the system board. RAM is installed directly onto the system board using industry standard, 72-pin, 70 ns parity memory modules. There are four sockets to allow a maximum of 64MB (2MB, 4MB, 8MB, and 16MB memory modules are supported). Refer to "Computer Memory" on page 49.
  - 512KB of video memory (DRAM) is standard on the system board. Four video DRAM sockets allow a maximum of 1MB of video DRAM
  - Ports include: two serial, one parallel, one keyboard, one mouse, and one video
  - Connectors for AT riser card (120-pin), input power (12-pin), AT diskette drives (34-pin), AT hard disk drives (40-pin), power LED (2-pin), hard disk LED (2-pin), beeper (2-pin), and video feature (26-pin)
  - Lithium battery
- **System Board (Type 6381 DX and DX2)**
  - 8KB internal cache
  - Field upgradeable to 128KB or 256KB external cache
  - Built-in math coprocessor
  - 4MB RAM pre-installed on the system board. RAM is installed directly onto the system board using industry standard, 72-pin, 70 ns parity memory modules. There are four sockets to allow a maximum of 64MB (2MB, 4MB, 8MB, and 16MB memory modules are supported). Refer to "Computer Memory" on page 49.
  - 512KB of video memory (DRAM) is standard on the system board. Four video DRAM sockets allow a maximum of 1MB of video DRAM
  - Ports include: two serial, one parallel, one keyboard, one mouse, and one video
  - Connectors for AT riser card (120-pin), input power (12-pin), AT diskette drives (34-pin), AT hard disk drives (40-pin), power LED (2-pin), hard disk LED (2-pin), beeper (2-pin), and video feature (26-pin)
  - Lithium battery

- **System Board (Type 6382 /S and 6384 /D)**

  Models 425SX /S, 425SX /D, 433SX /S, 433SX /D, 433DX /S, 433DX /D, 466DX2 /S, and 466DX2 /D:
    - DX and DX2 models have a built-in math coprocessor
    - Supports 8KB internal cache and 128KB or 256KB external cache. (External cache is standard on 466DX2 /S and 466DX2 /D, and field upgradeable on 425SX /S, 425SX /D, 433SX /S, 433SX /D, 433DX /S, and 433DX /D)
    - RAM is installed directly onto the system board using industry standard, 72-pin, 70 to 85 ns memory modules. There are four sockets to allow a maximum of 64 MB (2MB, 4MB, 8MB, and 16MB memory modules are supported). Refer to "Computer Memory" on page 49.
    - 1 MB of Video memory (DRAM) is soldered on the system board. Two video DRAM sockets allow a maximum of 2MB of video DRAM
    - Ports include: two serial, one parallel, one keyboard, one mouse, and one video
    - Connectors for AT riser card (120-pin with a 112-pin local bus extension), input power (12-pin), AT diskette drives (34-pin), AT hard disk drives (40-pin), power LED (2-pin), hard disk LED (2-pin), speaker (2-pin), and video feature (26-pin)
    - Lithium battery
- **System Board (Type 6384)**

  Model 325T:
    - 2MB computer memory and 1MB video memory (DRAM) soldered on system board
    - Math coprocessor socket
    - Two 72-pin computer memory sockets (accepts 70 to 85 ns). Maximum Memory = 16MB. Refer to "Computer Memory" on page 49.
    - Ports include: one serial, one parallel, one keyboard, one mouse, and one video
    - Connectors for AT* riser card (120-pin), input power (12-pin), AT diskette drives (34-pin), AT hard disk drives (40-pin), power LED (2-pin), hard disk LED (2-pin), and video feature (26-pin)
    - Lithium battery

  Model 425SX:
    - Math coprocessor socket
    - Supports 8KB internal cache. (External cache not supported)

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* Trademark of the IBM Corporation.

- RAM is installed directly onto the system board using industry-standard, 30-pin, 70 or 80 ns memory modules. There are two banks of four sockets to allow a maximum of 32MB. 1MB and 4MB memory modules are supported. Refer to "System Board Layouts" on page 74. Bank 0 or bank 1 must be filled with the same size memory modules to work properly. Refer to "Computer Memory" on page 49.
- 1MB Video memory (DRAM) soldered on the system board
- Ports include: two serial, one parallel, one keyboard, one mouse, and one video
- Connectors for AT riser card (120-pin), input power (12-pin), AT diskette drives (34-pin), AT hard disk drives (40-pin), power LED (2-pin), hard disk LED (2-pin), and video feature (26-pin)
- Lithium battery

Model 433DX (built-in math coprocessor):
- Supports 8KB internal cache and 128KB external cache. (Not field upgradeable)
- RAM is installed directly onto the system board using industry-standard, 30-pin, 70 or 80 ns memory modules. There are two banks of four sockets to allow a maximum of 32 MB (1MB and 4MB memory modules are supported). One or both banks must be filled with the same size memory modules to work properly. Refer to "Computer Memory" on page 49.
- 1 MB of Video memory (DRAM) soldered on the system board
- Ports include: two serial, one parallel, one keyboard, one mouse, and one video
- Connectors for AT riser card (120-pin), input power (12-pin), AT diskette drives (34-pin), AT hard disk drives (40-pin), power LED (2-pin), hard disk LED (2-pin), and video feature (26-pin)
- Lithium battery

Model 466DX2 (built-in math coprocessor):
- Supports 8KB internal cache and 128KB external cache. (Not field upgradeable)
- RAM is installed directly onto the system board using industry-standard, 30-pin, 70 or 80 ns memory modules. There are two banks of four sockets to allow a maximum of 32 MB (1MB and 4MB memory modules are supported). One or both banks must be filled with the same size memory modules to work properly. Refer to "Computer Memory" on page 49.
- 1 MB of Video memory (DRAM) soldered on the system board
- Ports include: two serial, one parallel, one keyboard, one mouse, and one video

- Connectors for AT riser card (120-pin), input power (12-pin), AT diskette drives (34-pin), AT hard disk drives (40-pin), power LED (2-pin), hard disk LED (2-pin), and video feature (26-pin)
  - Lithium battery
- **System Board (Type 6384 P60/D)**

  Model Pentium
  - Pentium models have a built-in math coprocessor
  - Supports 16KB internal cache and 256KB external cache (standard)
  - RAM is installed directly onto the system board using industry standard, 72-pin, 70 ns memory modules. There are four sockets to allow a maximum of 128 MB (4MB, 8MB, 16MB, and 32MB memory modules are supported). Refer to "Computer Memory" on page 49.
  - 1 MB of Video memory (DRAM) is soldered on the system board. Two video DRAM sockets allow a maximum of 2MB of video DRAM
  - Ports include: two serial, one parallel, one keyboard, one mouse, and one video
  - Connectors for AT riser card (120-pin without a local bus extension), input power (12-pin), AT diskette drives (34-pin), AT hard disk drives (40-pin), power LED (2-pin), hard disk LED (2-pin), speaker (2-pin), and video feature (26-pin)
  - Lithium battery
- **System Board (Type 6387 /T)**

  Models 433DX /T and 466DX2 /T:
  - DX and DX2 models have a built-in math coprocessor
  - Supports 8KB internal cache and 128KB or 256KB external cache. (466DX2 /T has 128KB external cache standard and is field upgradeable to 256KB. 433DX /T has no standard external cache, but is field upgradeable to 128KB or 256KB external cache.)
  - RAM is installed directly onto the system board using industry standard, 72-pin, 70 to 85 ns memory modules. There are four sockets to allow a maximum of 64 MB (2MB, 4MB, 8MB, and 16MB memory modules are supported). Refer to "Computer Memory" on page 49.
  - 1 MB of Video memory (DRAM) is soldered on the system board. Two video DRAM sockets allow a maximum of 2MB of video DRAM
  - Ports include: two serial, one parallel, one keyboard, one mouse, and one video
  - Connectors for AT riser card (120-pin with a 112-pin local bus extension), input power (12-pin), AT diskette drives (34-pin), AT hard

disk drives (40-pin), power LED (2-pin), hard disk
LED (2-pin), speaker (2-pin), and video feature
(26-pin)
  – Lithium battery
- **Power Supplies** (with CPU power switch)
  – PS/ValuePoint computers have either a 100-W,
    145-W, or 200-W universal voltage power supply
    with a fan and a connector for a detachable
    grounded 3-wire power cord. The power cable
    has five DASD connectors (one 3.5-inch diskette
    drive minipower connector, and four standard
    4-pin power connectors).

    When the computer is powered off for 10
    seconds or more and then powered on, the
    power supply generates a "power good" signal
    that resets the computer logic.
- **Cables**
  – One signal cable for hard disk drives and one
    signal cable for diskette drives
- **Diskette Drives**
  – 3.5-inch 1.44MB Slimline diskette drive in all
    models
  – 5.25-inch 1.2MB diskette drive (optional)
- **Hard Disk Drives**
  Hard disks are 3.5-inch Slimline AT drives with
  18 ms average access time.
    – 80MB with 32KB of "look-ahead" cache
    – 120MB with 64KB of "look-ahead" cache
    – 170MB with 32/64KB of "look-ahead" cache
    – 212MB with 64KB of "look-ahead" cache
    – 245MB with 64KB of "look-ahead" cache
    – 340MB with 96KB of "look-ahead" cache
    – 420MB with 64KB of "look-ahead" cache
    – 527MB with 256KB of "look-ahead" cache
- **Keyboard**
  – Enhanced 101- or 102-key keyboard
    with 1.8 m (6 ft.) cable
- **Mouse** with 1.8 m (6 ft.) cable

Specifications (6381)

(Minimum configuration)

System Unit Size:

- Width: 360 mm (14.2 in.)
- Depth: 420 mm (16.5 in.)
- Height: 122 mm (4.8 in.)

System Unit Weight:

- 8.1 kg (17.8 lb)

Environment:

- Temperature (System Unit and Display)
    - Power on: 10 to 35 degrees C (50 to 95 degrees F)
    - Power off: 10 to 43 degrees C (50 to 110 degrees F)
- Humidity (System Unit and Display)
    - Power on: 8% to 80%
    - Power off: 8% to 80%
- Maximum altitude: 2134 m (7000 ft.)

Heat output:

- 120 BTU/hr

Electrical:

- Input voltage (sinewave input is required)
    - Low Range
        - Minimum: 90 V ac
        - Maximum: 137 V ac
    - High Range
        - Minimum: 180 V ac
        - Maximum: 265 V ac

Specifications (6382)

(Minimum configuration)

System Unit Size:

- Width: 360 mm (14.2 in.)
- Depth: 420 mm (16.5 in.)
- Height: 122 mm (4.8 in.)

System Unit Weight:

- 8.1 kg (17.8 lb)

Environment:

- Temperature (System Unit and Display)
    - Power on: 10 to 35 degrees C (50 to 95 degrees F)
    - Power off: 10 to 43 degrees C (50 to 110 degrees F)
- Humidity (System Unit and Display)
    - Power on: 8% to 80%
    - Power off: 8% to 80%
- Maximum altitude: 2134 m (7000 ft.)

Heat output:

- 120 BTU/hr

Electrical:

- Input voltage (sinewave input is required)
    - Low Range
        - Minimum: 90 V ac
        - Maximum: 137 V ac
    - High Range
        - Minimum: 180 V ac
        - Maximum: 265 V ac

Specifications (6384)

(Minimum configuration)

System Unit Size:

- Width: 404 mm (15.9 in.)
- Depth: 420 mm (16.5 in.)
- Height: 147 mm (5.8 in.)

System Unit Weight:

- 9.7 kg (21.4 lb)

Environment:

- Temperature (System Unit and Display)
  - Power on: 10 to 35 degrees C (50 to 95 degrees F)
  - Power off: 10 to 43 degrees C (50 to 110 degrees F)
- Humidity (System Unit and Display)
  - Power on: 8% to 80%
  - Power off: 8% to 80%
- Maximum altitude: 2134 m (7000 ft.)

Heat output:

- 120 BTU/hr

Electrical:

- Input voltage (sinewave input is required)
  - Low Range
    - Minimum: 90 V ac
    - Maximum: 137 V ac
  - High Range
    - Minimum: 180 V ac
    - Maximum: 265 V ac

Specifications (6387)

(Minimum configuration)

System Unit Size:

- Width: 187 mm (7.4 in.)
- Depth: 429 mm (16.9 in.)
- Height: 413 mm (16.3 in.)

System Unit Weight:

- 11.4 kg (25 lb)

Environment:

- Temperature, System Unit and Display
    - Power on: 10 to 32 degrees C (50 to 95 degrees F)
    - Power off: 10 to 43 degrees C (50 to 110 degrees F)
- Humidity, System Unit and Display
    - Power on: 8% to 80%
    - Power off: 8% to 80%
- Maximum altitude: 2134 m (7000 ft.)

Heat output:

- 934 Btu/hr (maximum configuration)

Electrical:

- Input voltage (sinewave input is required)
    - Low Range
        - Minimum: 90 V ac
        - Maximum: 137 V ac
    - High Range
        - Minimum: 180 V ac
        - Maximum: 265 V ac

Hard Disk Drive Specifications

Size (MB)	80	120	170	212	212
Bytes/Sector	512	512	512	512	512
Sectors/Track	17	17	34	38	35
Cylinders	936	984	984	682	989
Heads	16	10	10	16	12
Rotational Speed (RPM)	3600	3524	3600/ 3551	3551	3314
Transfer Rate (Mb/sec)	13.3	6.0	13.3/ 9.0	22-14	17-30/ 19-26
Seek Time (ms):					
Track-to-Track	5.0	3.0	5.0	4.0	4.5
Average	18.5	15.0	18.5	15.0	14.0
Maximum	32.5	27.0	32.5	30.0	29.0
Interleave Factor	1:1	1:1	1:1	1:1	1:1
Recording Method	1, 7 RLL	1, 7 RLL	1, 7 RLL	1, 7 RLL	1, 7 RLL
dc Power:					
+5 V Tolerance	±5%	±5%	±5%	±5%	±5%
+12 V Tolerance	±8%	±8%	±8%	±8%	±8%
Power (W):					
Idle (typical)	2.9	1.8	3.2/ 3.7	3.7	2.0
Seek (typical)	3.2	4.8	3.5/ 3.9	3.9	3.0
Startup (typical)	6.0	10.0	8.3/10.0	10.0	12.0

Size (MB)	245	340	420	527
Bytes/Sector	512	512	512	512
Sectors/Track	31	55/48	56	63
Cylinders	967	1010/ 872	989	1024
Heads	16	6/16	15	16
Rotational Speed (RPM)	3551	3322/ 3600	3314	6300
Transfer Rate (Mb/sec)	22-14	17-30/ 19-26	17-30/ 19-26	24-44
Seek Time (ms):				
Track-to-Track	3.0	4.5	4.5	2.0
Average	15.0	14.0	14.0	9.0
Maximum	27.0	29.0	29.0	20.0
Interleave Factor	1:1	1:1	1:1	
Recording Method	1, 7 RLL	1, 7 RLL	1, 7 RLL	1, 7 RLL
dc Power:				
+5 V Tolerance	±5%	±5%	±5%	±5%
+12 V Tolerance	±8%	±8%	±8%	±8%
Power (W):				
Idle (typical)	3.2	2.0	2.0	7.0
Seek, R/W (typical)	3.3	3.0	3.0	11.0
Startup (typical)	8.0	12.0	12.0	30.5

Hardware Compatibility

PS/ValuePoint computers are designed to maintain compatibility with adapters, devices, and drives which fully support the following interfaces and physically fit into the computer.

Item	Interface
Hard Disk Drives	AT Interface
I/O Adapter Cards	Adapters that are IBM AT compatible and operate at 8MHz
Diskette Drives	AT Interface
Math Coprocessor	Intel**
Processor Upgrade	Intel
Video	Displays: • VGA or SVGA (operations at VGA or higher frequencies) • Physical interface compatible with the IBM PS/2* VGA interface 512KB RAM VGA modes (dependent on computer Video DRAM): – 640x480 (256 colors) standard resolution – 800x600 (256 colors) medium-high resolution – 1024x768 (16 colors) high resolution 1MB RAM VGA modes (dependent on computer Video DRAM): – 640x480 (256 colors) standard resolution – 800x600 (256 colors) medium-high resolution – 1024x768 (256 colors) high resolution – 1280x1024 (16 colors) high resolution
Serial	9-pin connector with RS232D electrical interface
Parallel	Bi-directional
Pointing Device	IBM PS/2-compatible mouse
Keyboard Device	IBM PS/2-compatible enhanced keyboard

** Trademark of the Intel Corporation.
* Trademark of the IBM Corporation.

Power-On Password

A power-on password denies access to the computer by an unauthorized user when the computer is powered on. When a power-on password is active, the password prompt appears on the screen each time the computer is powered on. The computer starts after the proper password is entered.

Removing a Power-on Password: To service a computer with an active and unknown power-on password, power-off the computer and do the following:

Note: Remind the user to enter a new password when service is complete.

- **Type 6381 Computers**

    1. Remove the battery for 10 minutes.
    2. Reinstall the battery.
    3. Power-on the computer. The password is erased from memory.

- **Type 6384 Computers**

    – Model 325T:

        1. Move the jumper on J8 so that it connects the center pin and the pin on the opposite end of the connector.
        2. Power-on the computer. The password is erased from memory. (Leave the jumper in that position until the next time you reset the password.)

    – Models 425SX, 433DX, and 466DX2:

        1. Move the jumper on JP8 so that it connects pins 2 and 3.
        2. Apply a momentary short across the two ends of capacitor C17.
        3. Move the jumper on JP8 back to pins 1 and 2. The password is erased from memory.
        4. While holding down both mouse buttons, power-on the computer. Release the mouse buttons when the cursor appears.
        5. When you are finished servicing the machine, run the Configuration Utility program to restore the configuration settings.

- **Type 6382 /S, 6384 /D, and 6387 /T Computers**
  - Models 425SX /S, 425SX /D, 433SX /S, 433SX /D, 433DX /S, 433DX /D, 466DX2 /S, 433DX /T, 466DX2 /T, and 466DX2 /D:

    Note:

    1. Move the jumper on J9 (type 1 system board) or J15 (type 2 system board), so that it connects the center pin and the pin on the opposite end of the connector.
    2. Power-on the computer. The password is erased from memory. (Leave the jumper in that position until the next time you reset the password.)

- **Type 6384 P60/D Computers**
  1. Remove the battery for 10 minutes.
  2. Reinstall the battery.
  3. Power-on the computer. The password is erased from memory.

Configuration Utility Program

The Configuration Utility program lets you view and change important hardware configuration information. Use the Configuration Utility program to:

- Restore a customized configuration when service is complete.
- Check the computer configuration when you get an error code and description.
- Check the computer hardware features, such as the amount of memory.
- Verify or make a change when you add a *hardware option*, such as a diskette drive, memory module, or math coprocessor.
- Verify a hardware change when you remove a hardware option.
- Change the computer serial and parallel port settings.
- Set up or change the computer password protection.

Configuration Utility Screen: The Configuration Utility screen has two functions:

- *View* information about how the computer hardware is set up (*hardware configuration*).
- *Change* information about certain hardware options in your computer.

The PS/ValuePoint computer displays hardware information automatically. The information you can change is enclosed in brackets: [   ].

The configuration for the following features can be changed on the screen:

Shadow BIOS in RAM
The Basic Input/Output System *(BIOS)* is the machine language that runs the computer. The BIOS is stored in *read-only memory* (ROM). The **Shadow BIOS in RAM** option increases the computer's performance by copying BIOS into *random-access memory* (RAM). Because the computer accesses RAM faster than it accesses ROM, programs run faster.

Diskette Drive (A: or B:)
This option displays an entry for each diskette drive in the computer. If you add or change a diskette drive, you must select the correct diskette drive type on the Configuration Utility screen.

Power-On Password
A *power-on password* restricts use of the computer. The password must be entered each time the computer is powered on.

A password can be up to seven characters long (letters, numbers, or a combination of the two). After you create a

password, *be sure to write it down and put it in a secure place*.

Startup Sequence
When the computer starts, it looks for operating system files on a diskette and then on the hard disk. If there is a diskette in the diskette drive that does not contain the operating system files, most computers send an error message and stop operating.

The PS/ValuePoint computer, however, has a *smart* startup sequence that automatically looks for operating system files on the hard disk if the files are not found on a diskette.

Note: On some models, selectable boot can be selected directly from the configuration utility screen.

Serial Port
The computer has either one or two serial ports. Each serial port has a special *address* (identifying location) assigned to it. If you add adapter cards to the computer that have additional serial ports, you must ensure that each serial port has a different address.

The **Serial Port** option lets you change the serial port addresses. If you change serial port addresses on the Configuration Utility screen, you also might need to make changes to the software. For instructions on changing the software, see the user's guide or online information that came with the software.

Parallel Port
The computer has one parallel port with a special *address* (identifying location) assigned to it. If you add adapter cards to the computer that have additional parallel ports, you must ensure that each parallel port has a different address.

The **Parallel Port** option lets you change the parallel port addresses. If you change parallel port addresses on the Configuration Utility screen, you also might need to make changes to the software. For instructions on changing the software, see the user's guide or online information that came with the software.

Date and **Time**
You can change the date and time on the computer using the **Date** and **Time** options. The changes take effect immediately.

Type the date in the format displayed on the screen. Type the time in 24-hour format. For example:

```
12 midnight is  00:00
12 noon is      12:00
 1 p.m. is      13:00
```

Starting the Configuration Utility Program:

There are two ways to start the Configuration Utility program:

1. When the computer detects an error, a *pop-up window* displays an error code and description. Press **Enter** to get the Configuration Utility screen.
2. When you power-on the computer, this symbol appears in the upper-right corner of the display:

```
┌─────────┐
│~~~~ ~~  │
│~~~~ ~~  │
│~~~~ ~~  │
└─────────┘
```

Press **F1** while this symbol is displayed to get the Configuration Utility screen.

The actual Configuration Utility screen might look slightly different from the following picture, but it functions the same.

Indicates that this option has been changed

Indicates current page

```
          Configuration Utility     Page 1 of 2
System Configuration:

  Processor                    80486SX
  Math Coprocessor             Not Installed

  Memory                       4096 KB
  Shadow BIOS in RAM           [No]

  Video Controller / Memory    CL-GD5410 / 512 KB

  Hard Disk                    80 MB
  Diskette Drive A:          ▶[1.44 MB 3.5"]
  Diskette Drive B:            [1.2 MB 5.25"]

  Mouse                        Installed
```

Brackets

Press Page Down key for next screen

Options

```
          Configuration Utility     Page 2 of 2
Setup Options:

  Power-on Password            [Disabled]

  Startup Sequence             [Smart]

  Serial Port A                [Serial_2 (2F8)]
  Parallel Port                [Parallel_1 (3BC)]

  Date                         03/25/92
  Time                         16:10:28



Use ↑ and ↓ to highlight an option.
Use ← and → to make a selection.
F1 – Help    Page Up – Previous            Esc – Save/Exit
```

Use these keys

Restoring the Default Configuration: To set the computer configuration to the default (original) settings:

- For Type 6381, 6382 /S, 6384 /D, 6384 P60/D, and 6387 /T, press F5 from any Configuration Utility screen.
- For Type 6384 and Type 6382 325T /S, press and hold both mouse buttons, then power-on the computer. (If a mouse is not available, follow "**2**" above to manually set the default configuration. Press **Esc** to save the configuration.)

Restoring a Customized Configuration: To restore a customized configuration, follow "**2**" above. When all selections have been made, press **Esc** to save the configuration.

Computer Memory

- **Type 6381 Computers**

  Four 72-pin sockets are available to add memory modules. Memory modules supported are 2MB, 4MB, 8MB, and 16MB. Memory module speeds supported are 70 and 80 ns.

- **Type 6384 Computers**

  Model 325T has 2MB of RAM soldered on the board. Two 72-pin sockets are available to add memory modules. Memory modules supported are 1MB, 2MB, 4MB, and 8MB. Memory module speed is from 70 ns to 85 ns. Sockets can accept either size and speed. A POST error code 225, "Unsupported SIMM" might appear on the display when an installed memory module is the wrong value.

  Models 425SX, 433DX, and **466DX2** have all computer memory socketed with memory modules. 30-pin 70 or 80 ns memory modules are installed in banks of four each. 1MB and 4MB memory modules are supported. One or both banks must be occupied with four memory modules. Each bank must contain memory modules of the same size. Memory modules must be 9 bits wide. No POST error is displayed when a memory module of the wrong value is installed.

- **Type 6382 /S, 6384 /D, and 6387 /T Computers**

  (All these models use the same system board identifiable by the riser card extension.) Four 72-pin sockets are available to add memory modules. Memory modules supported are 2MB, 4MB, 8MB, and 16MB. Memory module speed supported is from 70 ns to 85 ns. Sockets can accept either size and speed. A POST error code 225, "Unsupported SIMM" might appear on the display when an installed memory module is the wrong value.

- **Type 6384 P60/D Computers**

  Four 72-pin sockets are available to add memory modules. Memory modules supported are 4MB, 8MB, 16MB, and 32MB with a maximum of 128MB. Memory module speed supported is 70 ns.

6381 Memory Module Strategy

Memory modules in the Model 6381 must be installed according to the arrangement shown in the following table.

Table 1. 6381 Computer Memory Table				
Total Memory	MEM 1	MEM 2	MEM 3	MEM 4
4MB	1MB	1MB	2MB	–
4MB	2MB	2MB	–	–
4MB	4MB	–	–	–
6MB	1MB	1MB	4MB	–
6MB	2MB	4MB	–	–
8MB	1MB	1MB	2MB	4MB
8MB	2MB	2MB	4MB	–
8MB	4MB	4MB	–	–
8MB	8MB	–	–	–
10MB	1MB	1MB	4MB	4MB
12MB	2MB	2MB	4MB	4MB
12MB	4MB	4MB	4MB	–
16MB	4MB	4MB	4MB	4MB
16MB	8MB	8MB	–	–
16MB	16MB	–	–	–
18MB	1MB	1MB	16MB	–
18MB	2MB	16MB	–	–
20MB	2MB	2MB	16MB	–
20MB	4MB	16MB	–	–
24MB	2MB	2MB	4MB	16MB
24MB	4MB	4MB	16MB	–
24MB	8MB	8MB	8MB	–
32MB	8MB	8MB	8MB	8MB
32MB	16MB	16MB	–	–
36MB	2MB	2MB	16MB	16MB
36MB	4MB	16MB	16MB	–
40MB	4MB	4MB	16MB	16MB
48MB	16MB	16MB	16MB	–
64MB	16MB	16MB	16MB	16MB

Diagnostics and Test Information (6381, 6382, 6384, 6387)

The following information is helpful when diagnosing computer problems on types 6381, 6382, 6384, and 6387. For Model 6384 P60/D, see "Diagnostics and Test Information (6384 P60/D)" on page 61.

Power-On Self Test

Each time you power-on the computer, the power-on self test (POST) is initiated. The POST takes up to 90 seconds to complete, depending on the options installed.

The POST checks the following:

- System board
- Memory
- Video
- Hard disk drive(s)
- Diskette drive(s)
- Keyboard
- Mouse
- Parallel port
- Serial port(s)

To start the POST, power-on the display and the computer. The following happens:

1. The following icon

   appears at the upper-right corner of the display. Pressing F1 at this time causes the Configuration Utility menu to appear after the POST has completed.
2. A count of the computer memory appears at the upper-left corner of the display.
3. If an error is detected, an error code appears under the computer memory count.

   Note: Memory errors appear as XXXXXX XXXX 201 in the upper-left corner of the display (X can be a number or letter).

4. Successful completion of POST is attained when there are no errors detected in the computer.
5. The computer attempts to load the operating system. If an operating system is not found, a graphic message (icon) is displayed requesting the user to insert a diskette into drive A and press the F1 key to resume operation.
6. If a critical error is encountered, the POST is halted.

Diagnostics Diskette

Refer to the following table to use the correct "Advanced Diagnostics" diskette for the computer you are servicing.

Diskette Type	PS/ValuePoint Model
Type 1	6384 and 6382 325T /S
Type 2	6382 /S, 6384 /D, 6387 /T
Type 3	6381
Type 4	6384 P60/D

The four diskettes are not interchangeable.

The term "Diagnostics diskette" used in this book applies to any of the four diskettes.

The Diagnostics program is intended to test only PS/ValuePoint products. Non-PS/ValuePoint products, prototype cards, or modified options can give false errors and invalid computer responses.

To load the diagnostics diskette:

1. Power-off the computer.
2. Install the Diagnostics diskette in Drive A.
3. Power-on the computer.
4. Do not press **F1** when the icon appears.
5. If any POST error(s) appear after POST, make a note of the error(s) and press the **Esc** key.

Note: If an IBM logo screen appears, do the following:

1. Press Enter.
2. Select "Test the system."
3. Press Enter twice to continue.

To access diagnostic tests from the Select An Option Menu:

1. Select **0 (SYSTEM CHECKOUT)** option.
2. At the Installed Devices menu, press (**Y**), then **Enter**.
3. The **SYSTEM CHECKOUT** menu is displayed.
4. Select **0** or **1** from the **SYSTEM CHECKOUT** menu.
5. Select the device to be tested.

Diagnostic Menus

The following menus are available in the advanced
diagnostics tests.

Select an Option Menu: This menu appears if the
computer options are correctly set.

```
 SELECT AN OPTION

  0 - SYSTEM CHECKOUT
  1 - FORMAT DISKETTE
  2 - COPY DISKETTE
  3 - SETUP

  9 - END DIAGNOSTICS

```

0 - SYSTEM CHECKOUT: Starts the computer checkout
procedure.

1 - FORMAT DISKETTE: Formats a scratch diskette for
diagnostic use only.

2 - COPY DISKETTE: Copies the Diagnostics diskette to
another diskette. (On some Diagnostics diskettes, this
option is called "BACKUP THE DISKETTE" and is found
on the main menu.)

3 - SETUP: Allows you to check or change the computer
configuration. (This option is not available on all
Diagnostics diskettes.)

9 - END DIAGNOSTICS: Ends the diagnostic tests and
gives the option to restart the computer.

Diskette Drive Menu: This menu allows you to test the diskette drives and the control logic on the system board.

```
TESTING -
 X DISKETTE DRIVE(S)
 DISKETTE DIAGNOSTIC MENU
 ----------------------------
 OPTION
  1 - SEEK TEST
  2 - WRITE, READ, COMPARE TEST
  3 - VERIFY DISKETTE TEST
  4 - SPEED TEST
  5 - DISKETTE CHANGE TEST
  9 - RETURN TO CONTROL PROGRAM


 For option 9, type (9) and press Enter.
 For options 1 — 5,
 type the option number, drive ID (1, A), and press Enter.
```

1 - SEEK TEST: Tests the basic diskette seek operations, including sequential and random diskette drive head positioning.

2 - WRITE, READ, COMPARE TEST: Tests the basic diskette operations, including a series of random seeks. Each seek is followed by a write, read, and comparison of data.

3 - VERIFY DISKETTE TEST: Verifies data accessing and each sector.

4 - SPEED TEST: Measures the time required for one revolution of the diskette.

5 - DISKETTE CHANGE TEST: Tests the diskette change signal and write-protect feature as you remove and insert a diskette.

9 - RETURN TO CONTROL PROGRAM: Returns to the System Checkout menu or continues with the next device test.

Hard Disk Diagnostic Menu: This menu allows
you to test the hard disk drive and the integrated controller.

```
HARD DISK DIAGNOSTIC MENU
-------------------------
 1 - WRITE, READ, COMPARE (ON TEST CYLINDER)
 2 - SEEK TEST
 3 - HEAD SELECT
 4 - ERROR DETECTION AND CORRECTION
 5 - RUN ALL TESTS
 6 - READ VERIFY
 7 - FORMAT MENU
 9 - RETURN TO CONTROL PROGRAM

For option 9, type 9 and press Enter.
For other options
type the option number, drive ID (1, C), and press Enter.
```

1 - WRITE, READ, COMPARE (ON TEST CYLINDER):
Tests the hard disk drive read and write operations.

2 - SEEK TEST: Sequentially moves the hard disk heads
inward one cylinder at a time until the last cylinder is
reached. The heads then reset to the first cylinder and a
random seek test is performed.

3 - HEAD SELECT: Data is written to the test cylinder by
each hard disk head; the data is then read and checked
for any errors.

4 - ERROR DETECTION AND CORRECTION: Tests the
hard disk error checking and correction circuits by reading
data, altering the data, and writing the data on the test
cylinder. A comparison test is made to detect any errors.

5 - RUN ALL TESTS: Runs tests 1, 2, 3, and 4; also
reads track 0.

6 - READ VERIFY: A read operation is performed on the
entire hard disk drive; any tracks that cannot be read are
reported with existing defects.

7 - FORMAT MENU: Selects the Format Selection menu
for the hard disk drives.

9 - RETURN TO CONTROL PROGRAM: Returns to the
System Checkout menu or continues with the next device
test.

Formatting a Hard Disk Drive: Hard disk drives normally contain tracks in excess of their stated capacity to allow for defective tracks. The user is notified by a diagnostic message when the defect limit has been reached and service is recommended.

The Diagnostics Format program is different from the operating system format program. Before the customer can transfer information from the backup diskettes to the hard disk drive, the hard disk drive must be formatted using the operating system format program. Have the customer refer to the operating system manual for a description of the hard disk preparation commands.

Note: The Diagnostics Format program on this diskette might damage non-IBM hard disk drives. Refer to the documentation that came with the drive for low-level formatting information.

Warning: All data on the selected hard disk drive is destroyed during a format operation or surface analysis.

Format Menu

```
FORMAT SELECTION MENU
---------------------
 1 - CONDITIONAL FORMAT
 2 - UNCONDITIONAL FORMAT
 3 - SURFACE ANALYSIS
 9 - RETURN TO HARD DISK MENU
```

1 - CONDITIONAL FORMAT: The hard disk drive is scanned for any defective tracks, then formatted (except for any known defective tracks).

2 - UNCONDITIONAL FORMAT: The hard disk drive is formatted, except for any defective tracks that you specify.

3 - SURFACE ANALYSIS: Scans the hard disk drive by writing, reading, and comparing a unique data pattern to detect any defective tracks.

9 - RETURN TO HARD DISK MENU: Returns to the Hard Disk Diagnostic menu.

Warning: Formatting results in a complete loss of data on the hard disk drive, including system programs. If you are directed to or elect to format the hard disk drive, you must do the following:

1. Prior to formatting, have the customer back up all information, if possible.
2. Prior to returning the computer to the customer, you must reinstall the system programs on the hard disk.

Formatting Procedure: Before replacing a failing hard disk drive, try to format it as follows:

1. Power-off the computer. Check that the hard disk drive cable is tightly connected.
2. Insert the Diagnostics diskette into drive A.
3. Power-on the computer.
4. Press **0 (SYSTEM CHECKOUT),** then press **Enter**.
5. Depending on the options installed in the computer, questions about attached devices appears on the screen. Answer as required, then press **Enter**.
6. If the list is incorrect, run the Configuration Utility program. Check to see if any adapter or device is set to a conflicting address with any other adapter or device. Also be sure that any adapter or device missing from the list is not set to "disabled". Press **Y (IS THE LIST CORRECT (Y/N)?)**, then press **Enter**.
7. Press **0 (RUN TESTS ONE TIME)**, then press **Enter**.
8. Select **17 (HARD DISK DRIVE)**, then press **Enter**.
9. Press **7 (FORMAT MENU)**, then press **Enter**.
10. Press **1, C**, then press **Enter**.
11. Press **Y (DO YOU WANT TO CONTINUE (Y/N)?)**, then press **Enter**.
12. Press **Y** or **N (ALL DEFECTS WILL BE SHOWN ON THE DISPLAY, THEY CAN ALSO BE PRINTED ON LPT1. IS A HARD COPY NEEDED?)**, then press **Enter**.
13. If you were instructed to perform an **UNCONDITIONAL FORMAT**, follow the instructions on the screen.

Video Graphics Display Menu: This menu allows you to test the VGA and SVGA displays and control logic on the system board.

```
VIDEO GRAPHICS DISPLAY

 1 - VGA TEST
 2 - DISPLAY ATTRIBUTES
 3 - CHARACTER TESTS
 4 - GRAPHICS TESTS
 5 - SCREEN PAGING
 6 - RUN TESTS 1 THROUGH 5
 7 - SYNC TEST

 9 - RETURN TO CONTROL PROGRAM
```

1 - VGA TEST: Verifies the video portion of the system board.

2 - DISPLAY ATTRIBUTES: Shows the following character attributes: normal and high intensity, reverse video, blinking, non-display, and 16 colors.

3 - CHARACTER TESTS: Shows the following character modes: 40 x 25, 80 x 25, 80 x 30, and 256 ASCII characters.

4 - GRAPHICS TESTS: Displays various patterns to test the display graphics modes.

5 - SCREEN PAGING: Tests the video-addressing circuitry.

6 - RUN TESTS 1 THROUGH 5: Performs tests 1 through 5 on a VGA or 63XX PS/ValuePoint display.

7 - SYNC TEST: Provides a test signal to allow voltage measurement at the video connector. (This option is not available on all Diagnostics diskettes.)

9 - RETURN TO CONTROL PROGRAM: Returns to the System Checkout menu or continues with the next device test.

Error Log

Use the following steps to create an error log, run the diagnostic tests, and automatically record any error messages in an error log. This procedure is normally used to diagnose an intermittent problem.

Note: The errors must be logged to a diskette drive or to a printer. If recording errors on a diskette, use a copy of the Diagnostics diskette that is not write-protected. **Do not run any diskette test when logging to a diskette drive.**

Creating the Error Log

1. Load the Diagnostics diskette from drive A.
2. Press **0 (SYSTEM CHECKOUT)**, then press **Enter**.
3. Depending on the options installed in the computer, questions about attached devices might appear on the screen. Answer as required, then press **Enter**.
4. Press **Y** or **N (IS THE LIST CORRECT (Y/N)?)**, then press **Enter**.
5. Press **2 (LOG UTILITIES)**, then press **Enter**.
6. Press **0 (START ERROR LOG)**, then press **Enter**.
7. Press **0 (LOG TO DISKETTE, OR PRINTER (0/1)?)**, then press **Enter**.
8. If you are logging to diskette, press **A** or **B (ENTER THE DRIVE ID FOR ERROR LOG?)**, then press **Enter**.
9. Press **9 (END LOG UTILITIES)**, then press **Enter**.

Starting the Test

1. Press **1 (RUN TESTS MULTIPLE TIMES)**, then press **Enter**.
2. Select the device you suspect has a failure, then press **Enter**.
3. Select the number of times the test is to be run, then press **Enter**.
4. Press **N (WAIT EACH TIME AN ERROR OCCURS (Y/N)?)**, then press **Enter**.
5. Follow any instructions on the screen and select all available tests.

    Note: Do not press any keys during the keyboard test.

6. To end **(RUN TEST CONTINUOUSLY)**, press **Ctrl+Break**. The computer completes testing and returns to the Installed Devices menu.

Display the Error Log

1. Depending on the options installed in the computer, questions about attached devices appear on the screen. Answer as required, then press **Enter**.
2. Press **Y** or **N (IS THE LIST CORRECT (Y/N)?)**, then press **Enter**.
3. Press **2 (LOG UTILITIES)**, then press **Enter**.
4. Press **2 (DISPLAY LOG)**, then press **Enter**.
5. Press **A** or **B (ENTER THE DRIVE ID FOR ERROR LOG?)**, then press **Enter**.
6. If no errors occurred, the Log Utilities menu appears. If errors are displayed, go to "Hardware Maintenance Service" on page 1.

Diagnostics and Test Information (6384 P60/D)

This section describes how to run the 6384 P60/D diagnostics tests.

To start the diagnostics tests:

1. Power-off the computer.
2. Insert the Diagnostics Diskette Type 4 into the primary 3.5-inch diskette drive.
3. Power-on the display and all external devices.
4. Power-on the computer. (An IBM PS/ValuePoint logo screen appears once or twice during POST.)
5. When the IBM PS/ValuePoint System Diagnostics logo screen appears, press **Enter**.
6. Select **Test the system** from the Main Menu, then press **Enter**. The following System Diagnostics screen appears.

```
                 IBM PS/ValuePoint - System Diagnostics


    TEST     ERRORS                        OPTIONS    HELP    QUIT

    1 SYSTEM_BOARD
    2 PROCESSOR
    3 SYSTEM_MEMORY
    4 EXTERNAL_CACHE
    5 KEYBOARD
    6 MOUSE
    7 VIDEO
    8 SPEAKER
    9 I/O_PORTS
   10 DISKETTE_DRIVE
   11 HARD_FILE




 <ENTER> Run tests  <ESCAPE> Exit  <F1> Help  <F2> Run all tests      <TAB> More
```
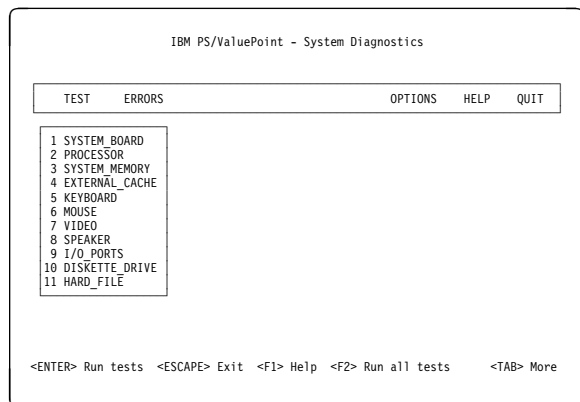
Figure 1. System Diagnostics Screen

The System Diagnostics screen contains a menu bar near the top of the screen, and instructions at the bottom of the screen. Use the left and right arrow keys on the keyboard to select a menu item. For some items, when you make a selection, another menu appears. Use the up and down arrow keys to make selections on that menu, then press **Enter**.

If the IBM PS/ValuePoint System Diagnostics logo screen, Main Menu, or IBM PS/ValuePoint System Diagnostics screens do not appear go to "Symptom-to-FRU Index" on page 12.

To run all the component tests, go to the next section, "Running All Tests" on page 62.

To run tests on selected components, go to "Running Selected Tests" on page 62.

Running All Tests

Note: If the computer hangs during testing, replace the last FRU being tested. If that does not solve the problem, go to "Undetermined Problem" on page 5.

To test all the FRUs in the computer:

1. Select **Test** from the menu bar.
2. Press **Alt+F4**, then answer the questions that appear on the screen. Press **Enter** after answering each question. After the last question, the following message appears.

   `Enable tests: complete. (press any key ...)`

3. Press **Alt+F2**. The following message appears.

   `Run all tests: how many times? [<cr> = no limit]:`

4. Enter the number of times for the tests to run, then press **Enter**.

   Note: If you press **Enter** without specifying a number, the tests run continuously until you press **Ctrl+C** or **Ctrl+Break**.

If a test is successful, a message appears indicating the test completed successfully. When all the tests have completed, the following message appears:

   `Test complete (press any key...)`

Press any key to return to the Test menu.

If a test is not successful, an error message indicates the failure. (The error message is placed in an error log for later review.) Also, the Errors text in the menu bar blinks and the following message appears:

   `Test complete (press any key...)`

Press any key to return to the Test menu. To end testing at any time, press **Ctrl+C** or **Ctrl+Break**.

Running Selected Tests

To test selected FRUs in the computer:

1. Select **Test** from the menu bar.
2. Press **Alt+F3** to disable all FRU tests, then press any key.
3. Use the up and down arrow keys to select the FRU(s) you want to test.
4. Press **F4** to enable the FRU test.
5. If any questions appear, press **Y** or **N**, then press **Enter**.
6. Press any key to enable the test.
7. Press **Enter**, enter the number of times to run the test, then press **Enter** to start the test.

   Note: If a sub-menu appears, press **F4** to enable any test in the sub-menu, then press **Enter** to start that test. (**F3** disables any of the enabled tests.)

Diagnostics Screen Function Keys

This section contains information about the function keys used in the 6384 P60/D Diagnostics tests.

Key	Description

F1   Help. Displays general help information at any time for a highlighted item.

F2   Run selected tests. The following message appears.

```
Run tests how many times? [<cr> = no limit]
```

> **Note:** If you press **Enter** without specifying a number, the tests run continuously until you press **Ctrl+C** or **Ctrl+Break**.

F3   Disable selected tests. The following message appears (in this case, for the microprocessor):

```
PROCESSOR tests disabled (press any key...)
```

F4   Enable selected tests. For interactive, destructive, or external hardware tests, questions must be answered before they can be run, then the following message appears.

```
Enable tests complete (press any key...)
```

If all the tests associated with a component are not enabled, the following message appears.

```
Enable tests: complete, not all tests enabled.
  (press any key ...)
```

F7   View error messages in the error message file.

Alt+F2

Run all enabled tests sequentially. The following message appears.

```
Run tests how many times? [<cr> = no limit]
```

> **Note:** If you press **Enter** without specifying a number, the tests run continuously until you press **Ctrl+C** or **Ctrl+Break**.

Alt+F3

Disable all tests. The following message appears.

```
All tests disabled (press any key...)
```

You cannot run a disabled test.

Alt+F4

Enable all tests. For interactive, destructive, or external hardware tests, questions must be answered before they can be run, then the following message appears.

```
All Enable tests complete (press any key...)
```

Diagnostics Screen Menus

This section contains descriptions of the menus at the top of the System Diagnostics screen.

Test Menu

When you select a Test menu item, the screen displays the test name and asks how many times to run the test. For example, if you select the system board test (SYSTEM_BOARD), the following message appears.

```
Run SYSTEM_BOARD: how many times? [<cr> = no limit]
```

Note: If you press **Enter** without specifying a number, the tests run continuously until you press **Ctrl+C** or **Ctrl+Break**.

The screen displays more selections for some tests. For each item, Press **Y**, then press **Enter**. For example, if you select the mouse test (MOUSE), the screen displays two additional test selections: PORT and MOUSE. (A disabled test appears in subdued color in the menu. To enable a test, highlight it, then press either the **Spacebar** or **F4**.

Do one of the following:

- To run the highlighted test, press **Enter**.
- To run all the tests associated with the highlighted test, press **F2**.

During the tests, a window continuously displays the test results. Some tests use the entire screen, others use a window on the screen.

To end a test at any time, press **Ctrl+C** or **Ctrl+Break**.

If a test is successful, a message appears indicating the test has passed. When tests have been completed, the following message appears.

```
Test complete (press any key...)
```

When you press any key, the program returns to the Test menu.

If a test fails:

1. An error message is displayed, followed by a message that the test failed.
2. The error message is added to an error log.
3. The Errors text in the menu bar blinks.
4. The following message appears.

   ```
   Test complete (press any key...)
   ```

   Pressing any key returns you to the Test menu.

Errors Menu

From the Errors menu, you can view, clear or save error messages. The following are the Errors menu items.

Item   **Description**

View errors

The screen displays an error code and a brief explanation for each error found during the diagnostics tests. The following are two examples of error messages:

```
*** ERROR in VID_ATI.8514.1280x1024x4
Standard Error Code = 0290B003
(Error logged at 08-05-93  16:23:57)


*** ERROR HARD_FILE.HARD_FILE_0
Generic medium capacity drive Fixed Disk Drive 0
Buffers do not compare at byte offset 0x.    0
Write Buffer:
0000: C2 2C 25 68 E6 0A 25 52 49 FA F1 C6 2C 5C EC 56
Read Buffer:
0000: A2 6B 9E 08 FE 22 8F 16 B2 64 0E 06 82 01 5D 39
Standard Error Code = 00704023
(Error logged at 08-05-93  16:38:50)
```

The error messages are placed in a temporary file named TEST.OUT. The information in this file is lost if not saved in a permanent file before the computer is powered off or restarted. Select **Save errors** from this menu to save the error messages.

Clear errors

The following message appears.

```
Clear? (y/[n])
```

To erase all error messages, press **y**, then press **Enter**. To keep the error messages, press **n**, then press **Enter**.

Save errors

The following message appears.

```
Enter filename [test.out]:
```

To save the error messages to a file, type a path and file name or use the default file name, TEST.OUT, then press **Enter**. Press **Esc** to return to the Errors menu without saving the error messages.

Options Menu

The following are the Options menu items.

Item   Description

Line Printer

> When you select this option, the following
> message appears.
>
> ```
> Line printer: Enable? (y/[n])
> ```
>
> Press **y**, then press **Enter** to enable the printer.
>
> If you *do not* want to enable a printer, press **n**,
> then press **Enter** or **Esc**.
>
> Enabling a printer redirects the test results to the
> printer instead of a file.

Halt on error

> When you select this option, the following
> message appears.
>
> ```
> Halt on error: Enable? (y/[n])
> ```
>
> To halt program operation when an error is
> detected, press **y**, then press **Enter**.
>
> If you *do not* want to halt program operation when
> an error is detected, press **n**, then **Enter** or **Esc**.

Prompt on error

> When you select this option, the following
> message appears.
>
> ```
> Prompt on error: Enable? (y/[n])
> ```
>
> To receive a prompt when an error is detected,
> press **y**, then press **Enter**.
>
> If you *do not* want to receive a prompt when an
> error is detected, press **n**, then press **Enter** or
> **Esc**.

Continue after prompt

> When you select this option, the following
> message appears.
>
> ```
> Enter number of seconds to wait [no limit]:
> ```
>
> Enter the number of seconds for an interactive test
> to wait for a keyboard response before it
> continues. If no keyboard response is received in
> the specified time, the test continues or the next
> test begins. If you do not enter a value, the
> program waits for a response indefinitely.

Redirect to file

Sends the results of your testing to a file. When you select this option, the following message appears.

`Enter filename [test.out]:`

Type a path and file name or use the default file name, TEST.OUT; then press **Enter**.

Run all tests

Allows you to run all enabled diagnostics tests sequentially. To disable any tests, highlight the test; then press **F3**. The disabled test changes to a subdued color on the Test menu. To enable a test, press **F4**, answer any questions, then press **Enter** after each question. An enabled test changes to normal color on the Test menu.

When you select Run all tests, the following message appears.

`Run tests how many times? [<cr> = no limit]`

Enter the number of times for the tests to run, then press **Enter**.

> **Note:** If you press **Enter** without specifying a number, the tests run continuously until you press **Ctrl+C** or **Ctrl+Break**.

Help Menu

The Help menu selections contain detailed information on menus, function keys, windows, starting and stopping tests, and test parameters.

Quit

To end the diagnostics tests, select "Quit." To return to the main menu, press **Enter**, then press **Y**. Follow the directions at the bottom of the Main Menu screen to exit or to restart your computer. If testing does not find a problem, but you still have one, go to "Symptom-to-FRU Index" on page 12, and look for the problem symptom.

Hard Disk Drive Jumper Settings

Hard disk drives for PS/ValuePoint computers use jumpers or tabs to set the drives as primary or secondary. Match your hard disk drive to one of the following figures. Set the first drive as the primary (master) drive **1**. If a second drive is installed, set it as the secondary (slave) drive **2**.

Note: ▌ = Jumper, ▌ = Tab

80MB and 170MB AT Drives with Tabs
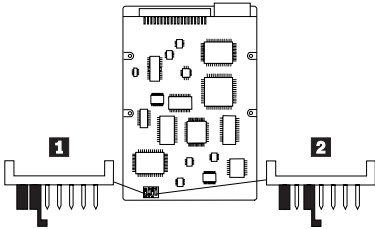
120MB AT Drive with Jumpers
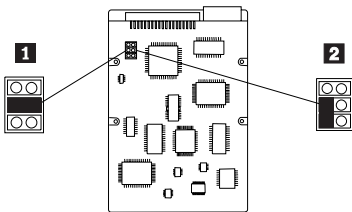
120MB AT Drive with Jumpers
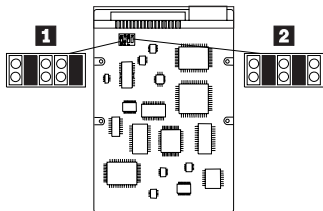
170MB, 212MB, and 245MB AT Drives with Jumpers
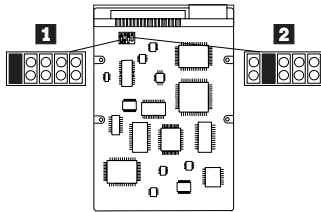
120MB, 170MB, 245MB, and 340MB AT Drives with Tabs
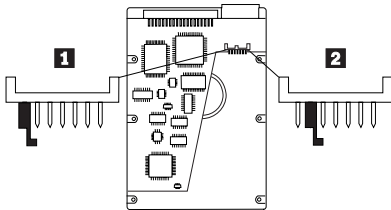
120MB, 170MB, 245MB, and 340MB AT Drives with Tabs
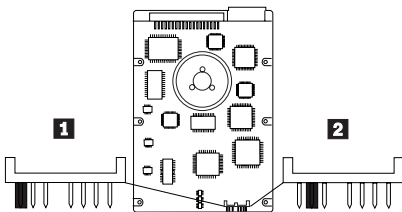
170MB, 212MB, 245MB, 340MB, and 420MB AT Drives with Tabs
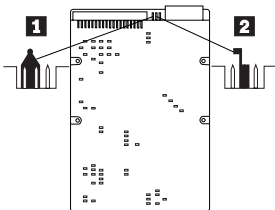
527MB AT Drive with Jumpers
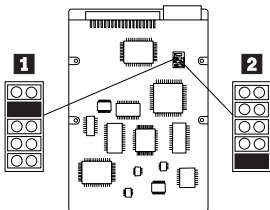
Computer Exploded View (6381)
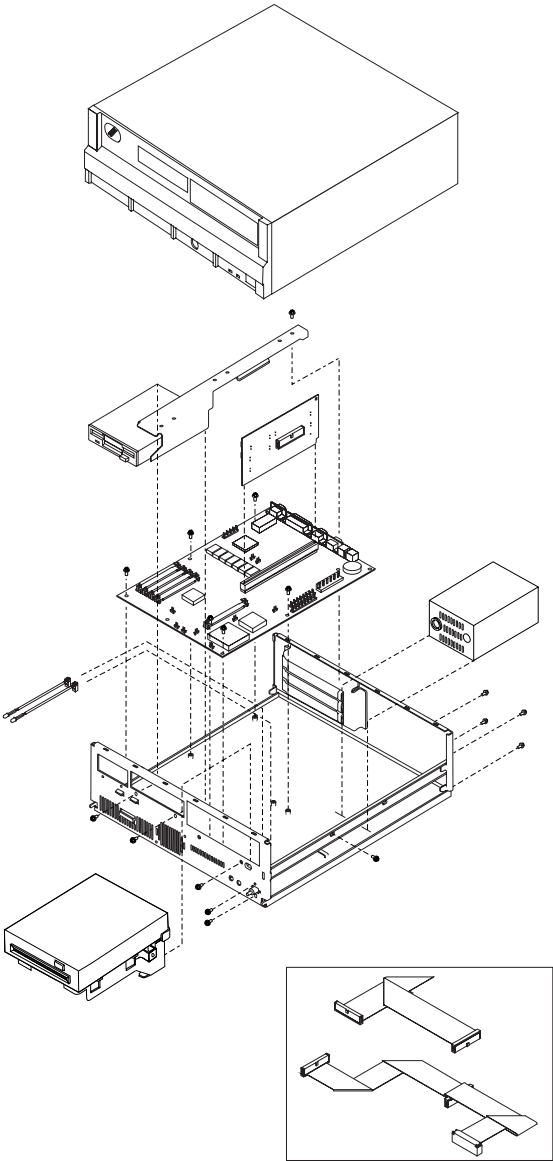
Computer Exploded View (6382)
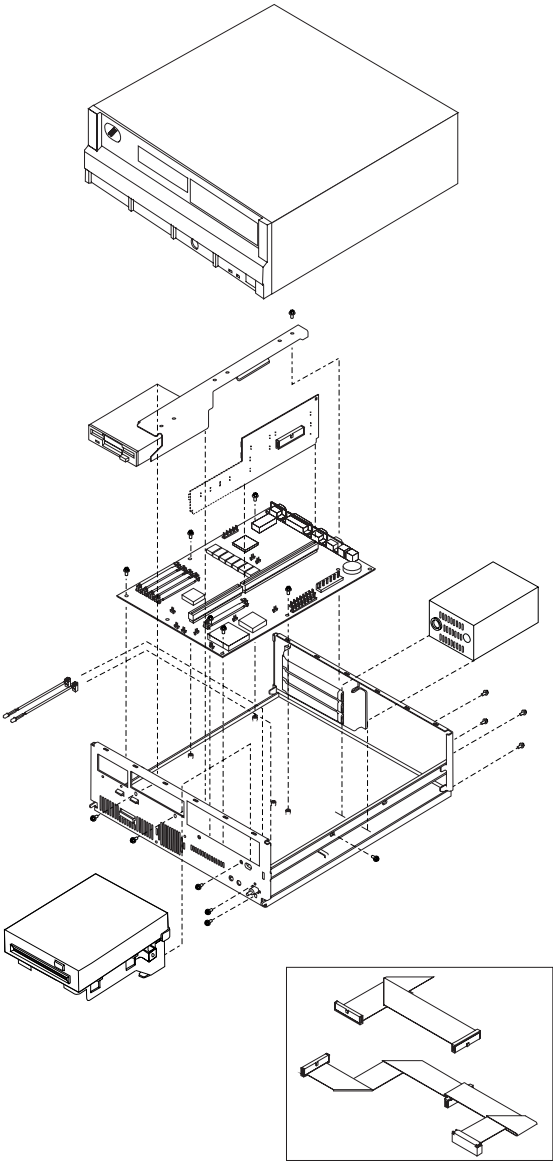
Computer Exploded View (6384)
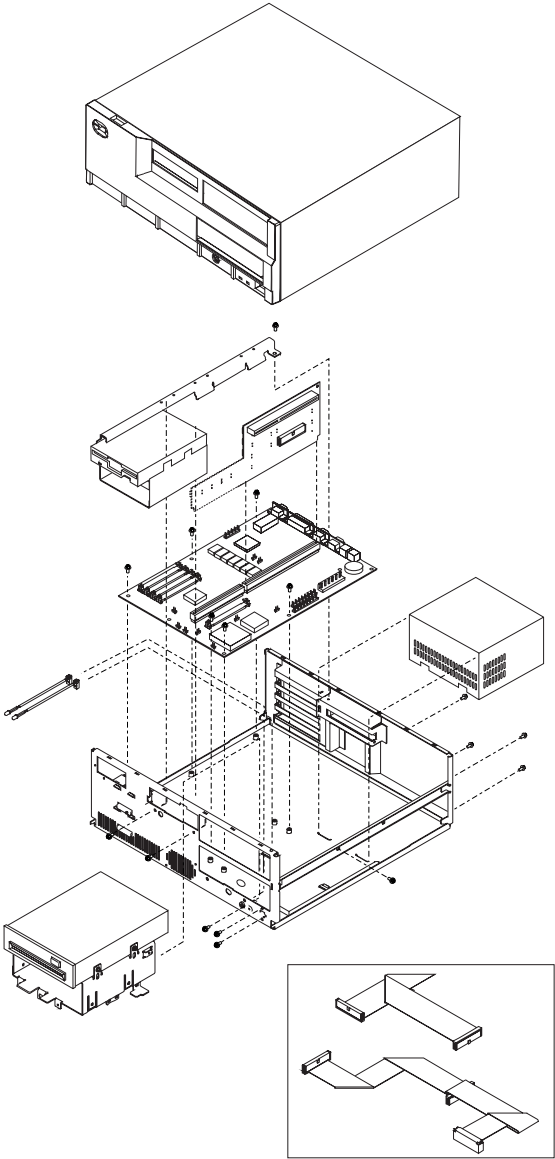
Computer Exploded View (6387)
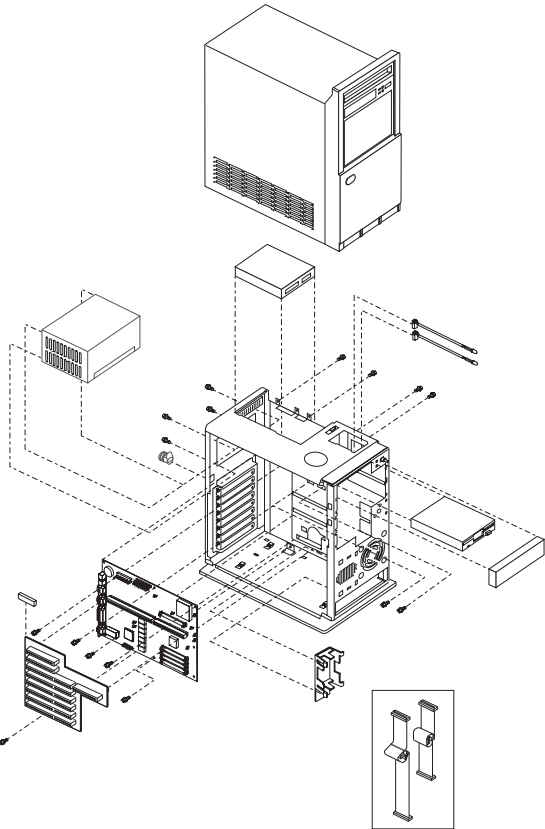
System Board Layouts

6381 SX System Board
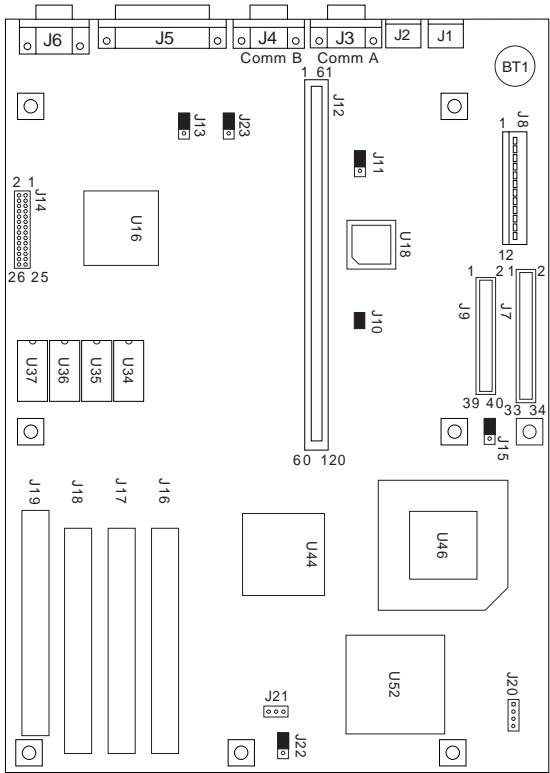
Figure 2. 6381 SX

6381 SX System Board

BT1   Battery

J1   Keyboard Connector
J2   Mouse Port
J3   Serial Port (Comm B)
J4   Serial Port (Comm A)
J5   Parallel Port
J6   Video Port
J7   Hard Disk Connector
J8   Power Supply Connector
J9   Diskette Connector
J10   Mouse Disable
J11   Flash Memory
J12   Riser Card Connector
J13   Video Enable
J14   Video Feature Connector
J15   Write Protect
J16   Memory-Module Socket, MEM 1
J17   Memory-Module Socket, MEM 2
J18   Memory-Module Socket, MEM 3
J19   Memory-Module Socket, MEM 4
J20   Hard Disk and Power-On LEDs
J21   Speaker Connector
J22   Speaker Enable
J23   Video Interrupt Enable

U34   Video Memory Connector
U35   Video Memory Connector
U36   Video Memory Connector
U37   Video Memory Connector
U46   Processor Upgrade Socket

Note: Jumpers are shown in the default position.

6381 DX or DX2 System Board
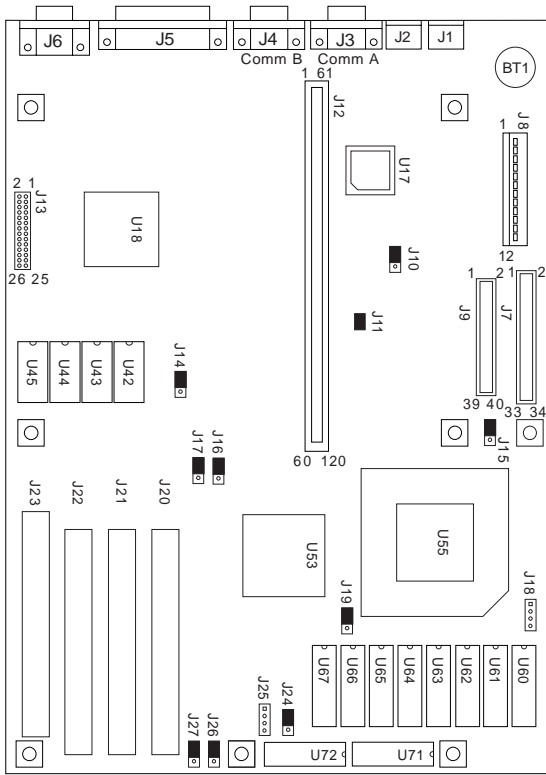
Figure 3. 6381 DX or DX2

6381 DX or DX2 System Board

BT1   Battery

J1	Keyboard Connector
J2	Mouse Port
J3	Serial Port (Comm B)
J4	Serial Port (Comm A)
J5	Parallel Port
J6	Video Port
J7	Hard Disk Connector
J8	Power Supply Connector
J9	Diskette Connector
J10	Flash Memory
J11	Mouse Disable
J12	Riser Card Connector
J13	Video Feature Connector
J14	Video Interrupt Enable
J15	Write Protect
J16	Video Enable
J17	Video Enable
J18	Hard Disk and Power-On LEDs
J19	Cache (Rear = 0 or 128K, Front = 256K)
J20	Memory-Module Socket, MEM 1
J21	Memory-Module Socket, MEM 2
J22	Memory-Module Socket, MEM 3
J23	Memory-Module Socket, MEM 4
J24	Speaker Enable
J25	Speaker Connector
J26	Cache (Rear = 0 or 128K, Front = 256K)
J27	Cache (Rear = 0 or 128K, Front = 256K)
U42	Video Memory Connector
U43	Video Memory Connector
U44	Video Memory Connector
U45	Video Memory Connector
U55	486DX/DX2 (and Upgrade) Processor Socket
U60	External Cache Connector
U61	External Cache Connector
U62	External Cache Connector
U63	External Cache Connector
U64	External Cache Connector
U65	External Cache Connector
U66	External Cache Connector
U67	External Cache Connector
U71	External Cache Enable Connector
U72	External Cache Enable Connector

Note: Jumpers are shown in the default position.

6382 325T/S System Board
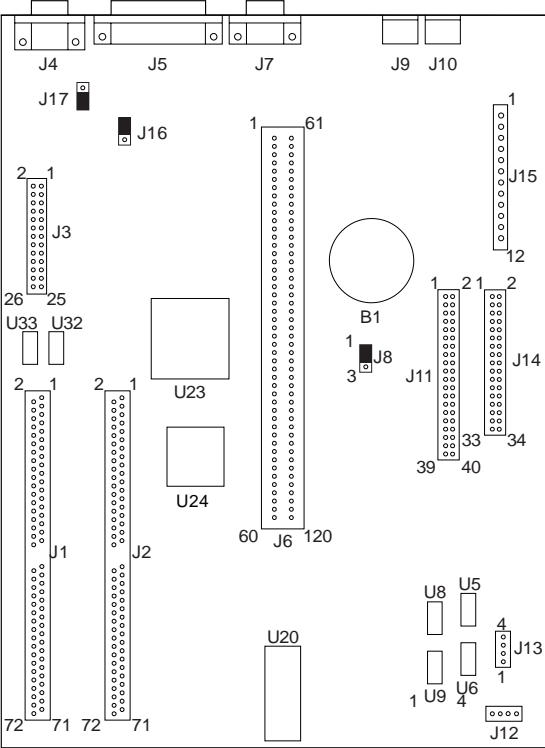
Figure 4. 6382 325T/S

6382 325T/S System Board

B1	Battery
J1	Memory-Module Socket 1
J2	Memory-Module Socket 0
J3	Video Feature Connector
J4	Video Port
J5	Parallel Port
J6	Riser Connector
J7	Serial Port
J8	Password Bypass
J9	Mouse Port
J10	Keyboard Port
J11	Hard Disk Connector
J12	Beeper Bypass
J13	Pins 1 and 2—Power-On LED
	Pins 3 and 4—Hard Disk LED
J14	Diskette Connector
J15	Power Connector
J16	IRQ9
J17	VGA Enable
U5	512K X 9 System Memory
U6	512K X 9 System Memory
U8	512K X 9 System Memory
U9	512K X 9 System Memory
U20	BIOS
U23	Math Coprocessor
U24	386SLC Processor
U32	256K X 16 Video Memory
U33	256K X 16 Video Memory

6382 /S System Board (Type 1)
(425SX, 433SX, 433DX, or 466DX2)
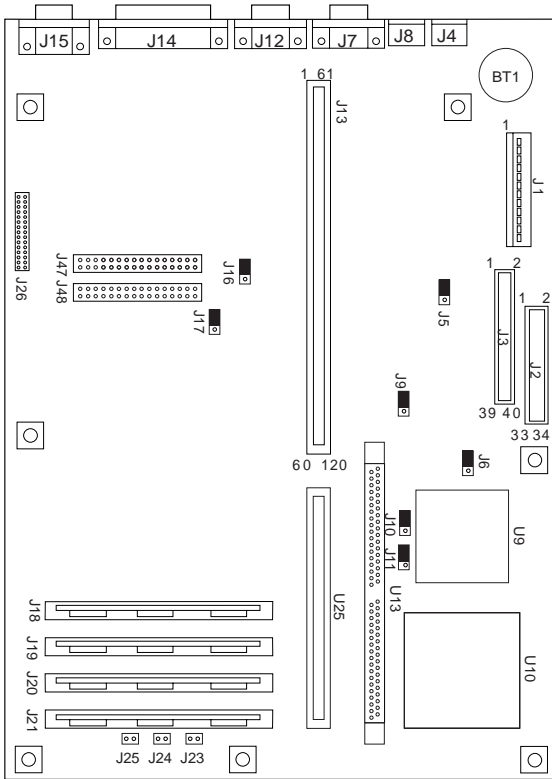
Figure 5. 6382 /S (Type 1)

6382 /S System Board (Type 1)

(425SX, 433SX, 433DX, or 466DX2)

BT1	Battery
J1	Power Connector
J2	Diskette Connector
J3	Hard Disk Connector
J4	Keyboard Connector
J5	BootBlock (not used: do not change)
J6	Write Disable
J7	Serial Port (Comm A)
J8	Mouse Port
J9	Password Bypass
J10	Processor Upgrade
J11	Processor Upgrade
J12	Serial Port (Comm B)
J13	Riser Connector
J14	Parallel Port
J15	Video Port
J16	Monochrome Adapter
J17	System Board Video Enable
J18	Memory-Module Socket, MEM 1
J19	Memory-Module Socket, MEM 2
J20	Memory-Module Socket, MEM 3
J21	Memory-Module Socket, MEM 4
J23	Power-On LED
J24	Hard Disk LED
J25	Speaker
J26	Video Feature Connector
J47	Video Memory Connector
J48	Video Memory Connector
U9	486SX Processor
U10	486DX or 486DX2 Processor Upgrade Socket
U13	Cache Socket
U25	Riser Connector Extension

Note: Jumpers should be set as shown.

6382 /S System Board (Type 2)
(425SX, 433SX, 433DX, or 466DX2)

Figure 6. 6382 /S (Type 2)

6382 /S System Board (Type 2)

(425SX, 433SX, 433DX, or 466DX2)

BT1   Battery

J1	Keyboard Connector
J2	Mouse Port
J3	Serial Port (Comm A)
J4	Serial Port (Comm B)
J5	Parallel Port
J6	Video Port
J7	Hard Disk Connector
J8	Power Connector
J9	Diskette Connector
J10	BootBlock (not used: do not change)
J11	Riser Connector
J12	Monochrome Adapter
J13	System Board Video Enable
J14	Video Feature Connector
J15	Password Bypass
J16	Write Disable
J17	Processor Upgrade
J18	Processor Upgrade
J19	Memory-Module Socket, MEM 1
J20	Memory-Module Socket, MEM 2
J21	Memory-Module Socket, MEM 3
J22	Memory-Module Socket, MEM 4
J24	Power-On LED
J25	Hard Disk LED
J26	Speaker

U49	Riser Connector Extension
U53	486SX Processor
U56	Cache Socket
U58	486DX or 486DX2 Processor Upgrade Socket

VEM1	Video Memory Connector
VEM2	Video Memory Connector

Note: Jumpers should be set as shown.

6384 325T System Board
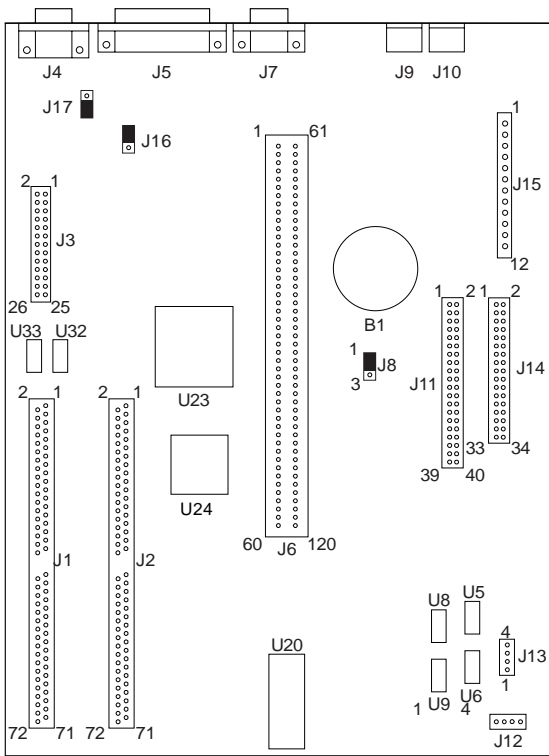
Figure 7. 6384 325T

6384 325T System Board

B1   Battery

J1   Memory-Module Socket 1
J2   Memory-Module Socket 0
J3   Video Feature Connector
J4   Video Port
J5   Parallel Port
J6   Riser Connector
J7   Serial Port
J8   Password Bypass
J9   Mouse Port
J10   Keyboard Port
J11   Hard Disk Connector
J12   Beeper Bypass
J13   Pins 1 and 2—Power-On LED
                 Pins 3 and 4—Hard Disk LED
J14   Diskette Connector
J15   Power Connector
J16   IRQ9
J17   VGA Enable

U5   512K X 9 System Memory
U6   512K X 9 System Memory
U8   512K X 9 System Memory
U9   512K X 9 System Memory
U20   BIOS
U23   Math Coprocessor
U24   386SLC Processor
U32   256K X 16 Video Memory
U33   256K X 16 Video Memory

6384 425SX System Board
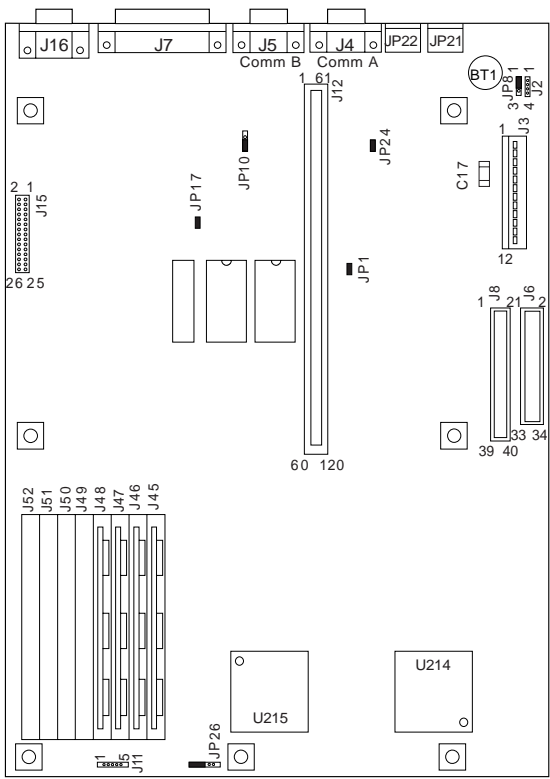
Figure 8. 6384 425SX

6384 425SX System Board

BT1   Battery

C17   Capacitor (Used with JP8 to erase password.)

J2   External Battery
J3   Power Connector
J4   Serial Port (Comm A)
J5   Serial Port (Comm B)
J6   Diskette Connector
J7   Parallel Port
J8   Hard Disk Connector
J11   Hard Disk LED (pin 4 and 5)
                Power-On LED (pin 1 and 2)
J12   Riser Connector
J15   Video Feature Connector
J16   Video Port
J45   Memory-Module Socket Bank 0, 0
J46   Memory-Module Socket Bank 0, 1
J47   Memory-Module Socket Bank 0, 2
J48   Memory-Module Socket Bank 0, 3
J49   Memory-Module Socket Bank 1, 0
J50   Memory-Module Socket Bank 1, 1
J51   Memory-Module Socket Bank 1, 2
J52   Memory-Module Socket Bank 1, 3

JP1   IRQ9
JP8   Battery Select
JP10   VGA Enable
JP17   VGA Enable
JP21   Keyboard Port
JP22   Mouse Port
JP24   Mouse Enable
JP26   Beeper Enable

U214   487SX or 486DX2
U215   486SX Processor

6384 433DX or 466DX2 System Board
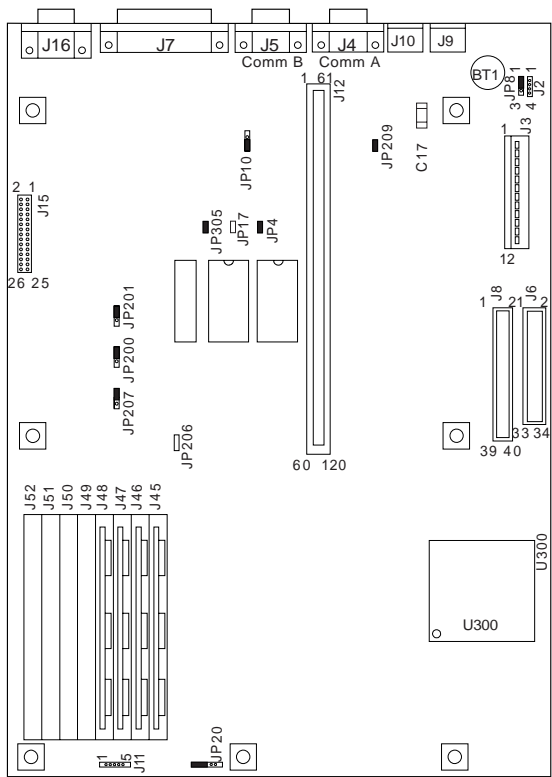
Figure 9. 6384 433DX or 466DX2

6384 433DX or 466DX2 System Board

BT1	Battery
C17	Capacitor (Used with JP8 to erase password.)
J2	External Battery
J3	Power Connector
J4	Serial Port (Comm A)
J5	Serial Port (Comm B)
J6	Diskette Connector
J7	Parallel Port
J8	Hard Disk Connector
J9	Keyboard Connector
J10	Mouse Port
J11	Hard Disk LED (pin 4 and 5)
	Power-On LED (pin 1 and 2)
J12	Riser Connector
J15	Video Feature Connector
J16	Video Port
J45	Memory-Module Socket Bank 0, 0
J46	Memory-Module Socket Bank 0, 1
J47	Memory-Module Socket Bank 0, 2
J48	Memory-Module Socket Bank 0, 3
J49	Memory-Module Socket Bank 1, 0
J50	Memory-Module Socket Bank 1, 1
J51	Memory-Module Socket Bank 1, 2
J52	Memory-Module Socket Bank 1, 3
JP4	BIOS Select
JP8	Battery Select
JP10	VGA Enable
JP17	VGA Enable
JP20	Beeper Enable
JP200	Cache Configuration
JP201	Cache Configuration
JP206	Cache Configuration
JP207	Cache Configuration
JP209	Mouse Enable
JP305	IRQ9
U300	486DX or 486DX2 Processor

Note: Jumpers should be set as shown.

6384 /D System Board (Type 1)

(425SX, 433SX, 433DX, or 466DX2)
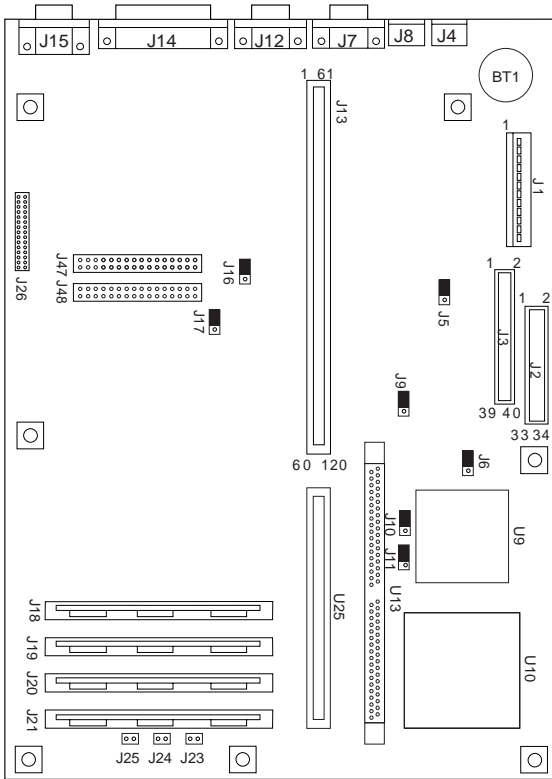
Figure 10. 6384 /D (Type 1)

6384 /D System Board (Type 1)
(425SX, 433SX, 433DX, or 466DX2)

BT1	Battery
J1	Power Connector
J2	Diskette Connector
J3	Hard Disk Connector
J4	Keyboard Connector
J5	BootBlock (not used: do not change)
J6	Write Disable
J7	Serial Port (Comm A)
J8	Mouse Port
J9	Password Bypass
J10	Processor Upgrade
J11	Processor Upgrade
J12	Serial Port (Comm B)
J13	Riser Connector
J14	Parallel Port
J15	Video Port
J16	Monochrome Adapter
J17	System Board Video Enable
J18	Memory-Module Socket, MEM 1
J19	Memory-Module Socket, MEM 2
J20	Memory-Module Socket, MEM 3
J21	Memory-Module Socket, MEM 4
J23	Power-On LED
J24	Hard Disk LED
J25	Speaker
J26	Video Feature Connector
J47	Video Memory Connector
J48	Video Memory Connector
U9	486SX Processor
U10	486DX or 486DX2 Processor Upgrade Socket
U13	Cache Socket
U25	Riser Connector Extension

Note: Jumpers should be set as shown.

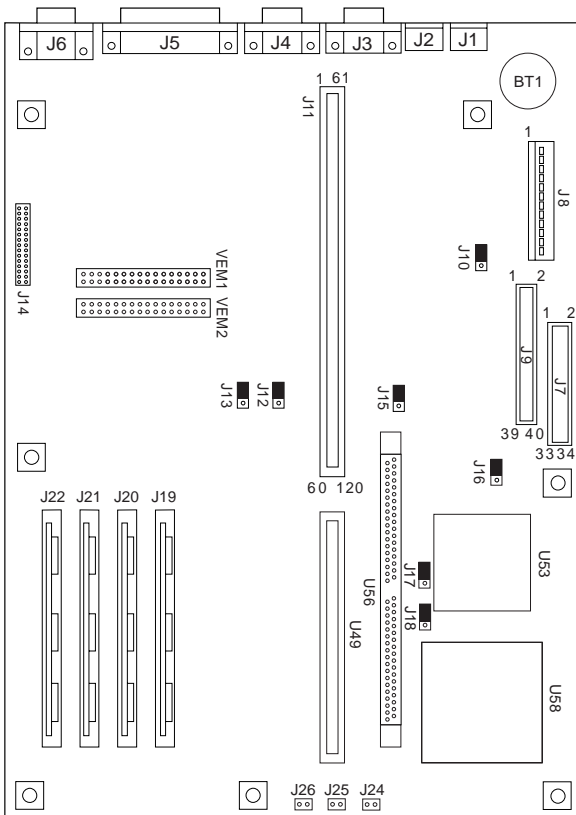## 6384 /D System Board (Type 2)

(425SX, 433SX, 433DX, or 466DX2)

Figure 11. 6384 /D (Type 2)

6384 /D System Board (Type 2)
(425SX, 433SX, 433DX, or 466DX2)

BT1	Battery
J1	Keyboard Connector
J2	Mouse Port
J3	Serial Port (Comm A)
J4	Serial Port (Comm B)
J5	Parallel Port
J6	Video Port
J7	Hard Disk Connector
J8	Power Connector
J9	Diskette Connector
J10	BootBlock (not used: do not change)
J11	Riser Connector
J12	Monochrome Adapter
J13	System Board Video Enable
J14	Video Feature Connector
J15	Password Bypass
J16	Write Disable
J17	Processor Upgrade
J18	Processor Upgrade
J19	Memory-Module Socket, MEM 1
J20	Memory-Module Socket, MEM 2
J21	Memory-Module Socket, MEM 3
J22	Memory-Module Socket, MEM 4
J24	Power-On LED
J25	Hard Disk LED
J26	Speaker
U49	Riser Connector Extension
U53	486SX Processor
U56	Cache Socket
U58	486DX or 486DX2 Processor Upgrade Socket
VEM1	Video Memory Connector
VEM2	Video Memory Connector

Note: Jumpers should be set as shown.

6384 P60/D Pentium System Board
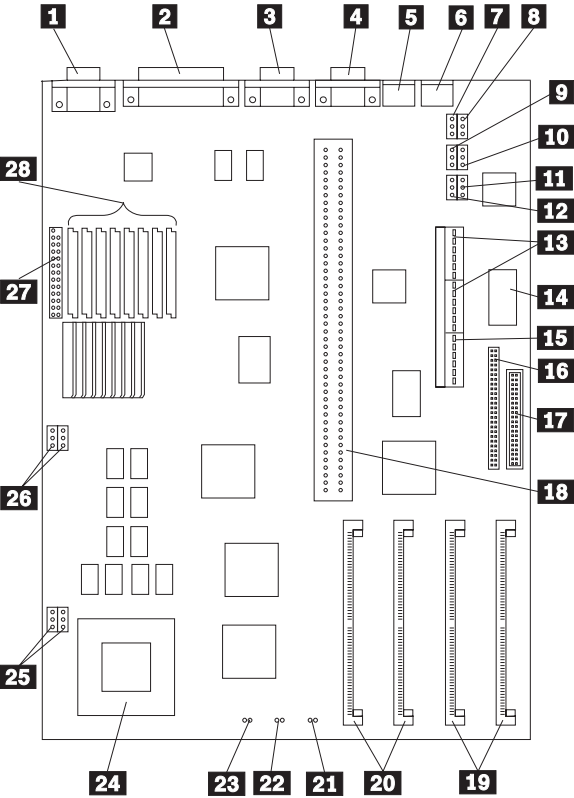
Figure 12. 6384 P60/D Pentium

6384 P60/D Pentium System Board

1   Video Port
2   Parallel Port
3   Serial Port (Comm B)
4   Serial Port (Comm A)
5   Mouse Port
6   Keyboard Port
7   Monochrome/Color
8   Setup (Reserved)
9   CMOS Normal/Clear
10   Password Bypass
11   Program Write Protect
12   FLASH Recover/Normal
13   Power Supply Connectors
14   Real-Time Clock
15   PCI Power Connector
16   Hard Disk Drive Connector
17   Diskette Drive Connector
18   Riser Connector
19   Memory Module Connectors, Bank 0
20   Memory Module Connectors, Bank 1
21   Power-on LED
22   Hard Disk LED
23   Speaker
24   Pentium Processor
25   Fan Power Connectors
26   66/60 MHz Jumper (Reserved)
27   Video Feature Connector
28   Video Memory Connectors

6387 /T System Board (Type 1)
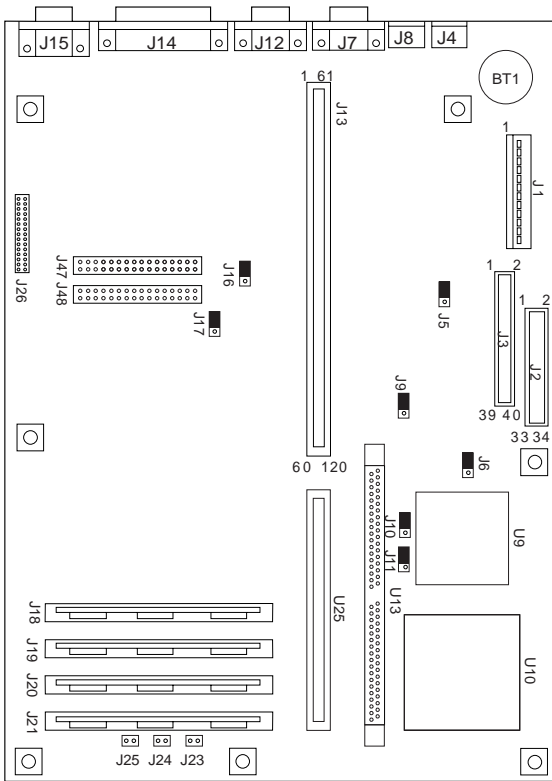
(433DX or 466DX2)

Figure 13. 6387 /T (Type 1)

6387 /T System Board (Type 1)
(433DX or 466DX2)

BT1	Battery
J1	Power Connector
J2	Diskette Connector
J3	Hard Disk Connector
J4	Keyboard Connector
J5	BootBlock (not used: do not change)
J6	Write Disable
J7	Serial Port (Comm A)
J8	Mouse Port
J9	Password Bypass
J10	Processor Upgrade
J11	Processor Upgrade
J12	Serial Port (Comm B)
J13	Riser Connector
J14	Parallel Port
J15	Video Port
J16	Monochrome Adapter
J17	System Board Video Enable
J18	Memory-Module Socket, MEM 1
J19	Memory-Module Socket, MEM 2
J20	Memory-Module Socket, MEM 3
J21	Memory-Module Socket, MEM 4
J23	Power-On LED
J24	Hard Disk LED
J25	Speaker
J26	Video Feature Connector
J47	Video Memory Connector
J48	Video Memory Connector
U10	486DX or 486DX2 Processor Upgrade Socket
U13	Cache Socket
U25	Riser Connector Extension

Note: Jumpers should be set as shown.

6387 /T System Board (Type 2)
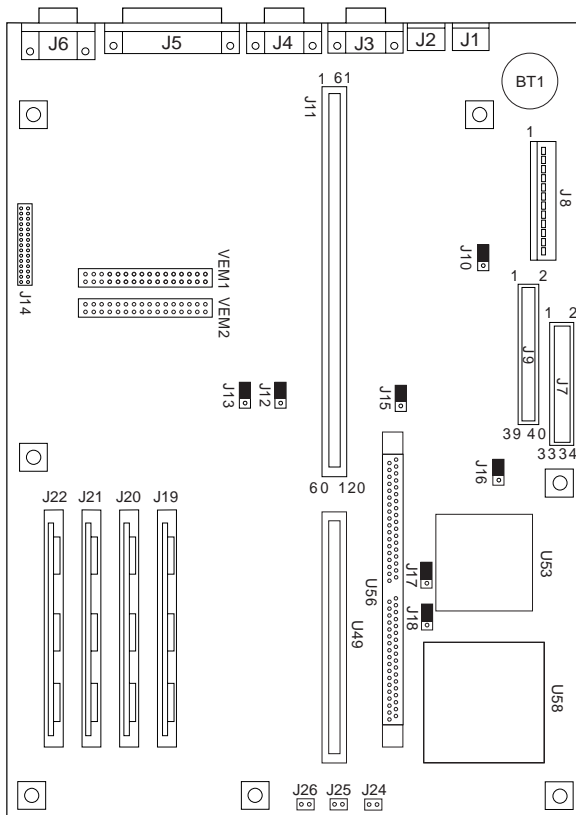
(433DX or 466DX2)

Figure 14. 6387 /T (Type 2)

6387 /T System Board (Type 2)
(433DX or 466DX2)

BT1   Battery

J1   Keyboard Connector
J2   Mouse Port
J3   Serial Port (Comm A)
J4   Serial Port (Comm B)
J5   Parallel Port
J6   Video Port
J7   Hard Disk Connector
J8   Power Connector
J9   Diskette Connector
J10   BootBlock (not used: do not change)
J11   Riser Connector
J12   Monochrome Adapter
J13   System Board Video Enable
J14   Video Feature Connector
J15   Password Bypass
J16   Write Disable
J17   Processor Upgrade
J18   Processor Upgrade
J19   Memory-Module Socket, MEM 1
J20   Memory-Module Socket, MEM 2
J21   Memory-Module Socket, MEM 3
J22   Memory-Module Socket, MEM 4
J24   Power-On LED
J25   Hard Disk LED
J26   Speaker

U49   Riser Connector Extension
U56   Cache Socket
U58   486DX or 486DX2 Processor Upgrade Socket

VEM1   Video Memory Connector
VEM2   Video Memory Connector

Note: Jumpers should be set as shown.

System Board Connector Assignments

Display/Signal

Pin	Signal Name	I/O
1	Red Video	O
2	Green Video	O
3	Blue Video	O
4	Monitor ID Bit 2	I
5	Sync Ground	
6	Red Ground	
7	Green Ground	
8	Blue Ground	
9	No Connection	
10	Sync Ground	
11	Monitor ID Bit 0	I
12	Monitor ID Bit 1	I
13	Horizontal Sync	O
14	Vertical Sync	O
15	Monitor ID Bit 3	I

Power

Pin	Signal Name
1	Power Good (+5 V dc)
2	+5 V dc
3	+12 V dc
4	−12 V dc
5	Ground
6	Ground
7	Ground
8	Ground
9	−5 V dc
10	+5 V dc
11	+5 V dc
12	+5 V dc

Parallel Port

Pin	Signal Name	I/O
1	Strobe	O
2	Data Bit 0	I/O
3	Data Bit 1	I/O
4	Data Bit 2	I/O
5	Data Bit 3	I/O
6	Data Bit 4	I/O
7	Data Bit 5	I/O
8	Data Bit 6	I/O
9	Data Bit 7	I/O
10	Acknowledge	I
11	Busy	I
12	Paper Empty	I
13	Select	O
14	Auto Feed	NA
15	Error	I
16	Initialize	O
17	Select (In)	O
18	Ground	Power
19	Ground	Power
20	Ground	Power
21	Ground	Power
22	Ground	Power
23	Ground	Power
24	Ground	Power
25	Ground	Power

Serial Port

Pin	Signal Name	I/O
1	Data Carrier Detect	I
2	Receive Data	I
3	Transmit Data	O
4	Data Terminal Ready	O
5	Signal Ground	
6	Data Set Ready	I
7	Request To Send	O
8	Clear To Send	I
9	Ring Indicator	I

Mouse

Pin	Signal Name	I/O
1	Data	I/O
2	No Connection	
3	Ground	Power
4	+5 V dc	Power
5	Clock	I/O
6	No Connection	

Keyboard

Pin	Signal Name	I/O
1	Data	I/O
2	No Connection	
3	Ground	Power
4	+5 V dc	Power
5	Clock	I/O
6	No Connection	

Diskette

Pin	Signal Name	I/O
1	Drive 2	
2	Density Select	O
3	No Connection	
4	No Connection	
5	Ground	
6	No Connection	
7	Ground	
8	Index	I
9	Ground	
10	Motor Enable 0	O
11	Ground	
12	Drive Select 1	O
13	Ground	
14	Drive Select 0	O
15	Ground	
16	Motor Enable 1	O
17	Ground	
18	Direction	O
19	Ground	
20	Step	O
21	Ground	
22	Write Data	I
23	Ground	
24	Write Enable	O
25	Ground	
26	Track 0	I
27	Ground	
28	Write Protect	I
29	Ground	
30	Read Data	I
31	Ground	
32	Select Head 1	O
33	Ground	
34	Diskette Change	I

Note: The diskette drive signal cable for drive A has a twist for the Drive Select and Motor Enable signals.

Hard Disk

Pin	Signal Name	I/O
1	Host Reset	O
2	Ground	
3	Host Data 7	I/O
4	Host Data 8	I/O
5	Host Data 6	I/O
6	Host Data 9	I/O
7	Host Data 5	I/O
8	Host Data 10	I/O
9	Host Data 4	I/O
10	Host Data 11	I/O
11	Host Data 3	I/O
12	Host Data 12	I/O
13	Host Data 2	I/O
14	Host Data 13	I/O
15	Host Data 1	I/O
16	Host Data 14	I/O
17	Host Data 0	I/O
18	Host Data 15	I/O
19	Ground	Power
20	No Connection	
21	No Connection	
22	Ground	
23	Host IOW	O
24	Ground	Power
25	Host IOR	O
26	Ground	Power
27	No Connection	
28	Host ALE	O
29	No Connection	
30	Ground	Power
31	Host IRQ	I
32	Host IOCS16	O
33	Host A1	O
34	No Connection	
35	Host A0	O
36	Host A2	O
37	Host CS0	O
38	Host CS1	O
39	Host Active	O
40	Ground	Power

Figure 15. Hard Disk

AT Bus Riser Connector

Pin	Signal Name	I/O
1	+12 V dc	
2	+5 V dc	
3	Ground	
4	Ground	
5	Reset Drv	O
6	+5 V dc	
7	IRQ9	I
8	–5 V dc	
9	DRQ2	I
10	–12 V dc	
11	OWS	
12	+12 V dc	
13	Ground	
14	SMEMW	O
15	SMEMR	O
16	IOW	I/O
17	IOR	I/O
18	DACK3	O
19	DRQ3	I
20	DACK1	O
21	DRQ1	I
22	Refresh	I/O
23	Computer Clock	O
24	IRQ7	I
25	IRQ6	I
26	IRQ5	I
27	IRQ4	I
28	IRQ3	I
29	DACK2	O
30	T/C	O
31	BALE	O
32	+5 V dc	
33	OSC	I
34	Ground	
35	Ground	
36	+5 V dc	
37	+5 V dc	
38	MEMCS16	I
39	IOCS16	I
40	IRQ10	I

Figure 16 (Part 1 of 3). AT Bus Riser Connector

AT Bus Riser Connector

Pin	Signal Name	I/O
41	IRQ11	I
42	Power Good	I
43	IRQ15	I
44	IRQ14	I
45	DACK0	O
46	DRQ0	I
47	DACK5	O
48	DRQ5	I
49	DACK6	O
50	DRQ6	I
51	DACK7	O
52	DRQ7	I
53	+5 V dc	
54	MASTER	I
55	Ground	
56	Ground	
57	Ground	
58	+5 V dc	
59	+5 V dc	
60	+5 V dc	
61	+12 V dc	
62	Ground	
63	Ground	
64	I/O Check	I
65	SD7	I/O
66	SD6	I/O
67	SD5	I/O
68	SD4	I/O
69	SD3	I/O
70	SD2	I/O
71	SD1	I/O
72	SD0	I/O
73	I/O CH Ready	I
74	AEN	O
75	SA19	O
76	SA18	O
77	SA17	O
78	SA16	O
79	SA15	O
80	SA14	O

Figure 16 (Part 2 of 3). AT Bus Riser Connector

AT Bus Riser Connector

Pin	Signal Name	I/O
81	SA13	O
82	SA12	O
83	SA11	O
84	SA10	O
85	SA9	O
86	SA8	O
87	SA7	O
88	SA6	O
89	SA5	O
90	SA4	O
91	SA3	O
92	SA2	O
93	SA1	O
94	SA0	O
95	Ground	
96	Ground	
97	+5 V dc	
98	SBHE	I/O
99	LA23	I/O
100	LA22	I/O
101	LA21	I/O
102	LA20	I/O
103	LA19	I/O
104	LA18	I/O
105	LA17	I/O
106	MEMR	I/O
107	MEMW	I/O
108	SD8	I/O
109	SD9	I/O
110	SD10	I/O
111	SD11	I/O
112	SD12	I/O
113	SD13	I/O
114	SD14	I/O
115	SD15	I/O
116	Ground	
117	Ground	
118	Ground	
119	+5 V dc	
120	+5 V dc	

Figure 16 (Part 3 of 3). AT Bus Riser Connector

AT Bus Riser Connector (Extension)

Pin	Signal Name	I/O
1 A	DAT01	I/O
2 A	DAT03	I/O
3 A	Ground	
4 A	DAT05	I/O
5 A	DAT07	I/O
6 A	DAT09	I/O
7 A	DAT11	I/O
8 A	DAT13	I/O
9 A	DAT15	I/O
10 A	Ground	
11 A	DAT17	I/O
12 A	+5 V dc	I/O
13 A	DAT19	I/O
14 A	DAT21	I/O
15 A	DAT23	I/O
16 A	DAT25	I/O
17 A	Ground	
18 A	DAT27	I/O
19 A	DAT29	I/O
20 A	DAT31	I/O
21 A	ADR30	I/O
22 A	ADR28	I/O
23 A	ADR26	I/O
24 A	Ground	
25 A	ADR24	I/O
26 A	ADR22	I/O
27 A	+5 V dc	I/O
28 A	ADR20	I/O
29 A	ADR18	I/O
30 A	ADR16	I/O
31 A	ADR14	I/O
32 A	ADR12	I/O
33 A	ADR10	I/O
34 A	ADR08	I/O
35 A	Ground	
36 A	ADR06	I/O
37 A	ADR04	I/O
38 A	WBACK	O
39 A	BE0	I/O

Figure 17 (Part 1 of 3). AT Bus Riser Connector (Extension)

AT Bus Riser Connector (Extension)

Pin	Signal Name	I/O
40 A	+5 V dc	I/O
41 A	BE1	I/O
42 A	BE2	I/O
43 A	Ground	
44 A	BE3	I/O
45 A	ADS	I/O
46 A	Not Used	I/O
47 A	Not Used	I/O
48 A	LRDY	I
49 A	LDEV	I
50 A	LREQ	I
51 A	Ground	
52 A	LGNT	O
53 A	+5 V dc	I/O
54 A	ID2	O
55 A	ID3	O
56 A	ID4	O
57 A	LKEN	O
58 A	LEADS	I/O
1 B	DAT00	I/O
2 B	DAT02	I/O
3 B	DAT04	I/O
4 B	DAT06	I/O
5 B	DAT08	I/O
6 B	Ground	
7 B	DAT10	I/O
8 B	DAT12	I/O
9 B	+5 V dc	I/O
10 B	DAT14	I/O
11 B	DAT16	I/O
12 B	DAT18	I/O
13 B	DAT20	I/O
14 B	Ground	
15 B	DAT22	I/O
16 B	DAT24	I/O
17 B	DAT26	I/O
18 B	DAT28	I/O
19 B	DAT30	I/O
20 B	+5 V dc	I/O

Figure 17 (Part 2 of 3). AT Bus Riser Connector (Extension)

AT Bus Riser Connector (Extension)

Pin	Signal Name	I/O
21 B	ADR31	I/O
22 B	Ground	
23 B	ADR29	I/O
24 B	ADR27	I/O
25 B	ADR25	I/O
26 B	ADR23	I/O
27 B	ADR21	I/O
28 B	ADR19	I/O
29 B	Ground	
30 B	ADR17	I/O
31 B	ADR15	I/O
32 B	+5 V dc	I/O
33 B	ADR13	I/O
34 B	ADR11	I/O
35 B	ADR09	I/O
36 B	ADR07	I/O
37 B	ADR05	I/O
38 B	Ground	
39 B	ADR03	I/O
40 B	ADR02	I/O
41 B	(not used)	I/O
42 B	RESET	O
43 B	D/C	I/O
44 B	M/IO	I/O
45 B	W/R	I/O
46 B	Not Used	I/O
47 B	Not Used	I/O
48 B	RDYRTN	O
49 B	Ground	
50 B	IRQ9	I
51 B	BRDY	I/O
52 B	BLAST	I/O
53 B	ID0	O
54 B	ID1	O
55 B	Ground	
56 B	LCLK	O
57 B	+5 V dc	I/O
58 B	LBS16	I/O

Figure 17 (Part 3 of 3). AT Bus Riser Connector (Extension)

Video Feature

Note: Video feature connector pin assignments for the 486SX processor are on the next page.

Pin	Signal Name	I/O
1	Pixel Data 0	I
2	Ground	
3	Pixel Data 1	I
4	Ground	
5	Pixel Data 2	I
6	Ground	
7	Pixel Data 3	I
8	Enable Ext Pixel Data	O
9	Pixel Data 4	I
10	Enable Ext Sync	O
11	Pixel Data 5	I
12	Enable Ext Pixel Clock	O
13	Pixel Data 6	I
14	No Connection	
15	Pixel Data 7	I
16	Ground	
17	Pixel Clock	I/O
18	Ground	
19	Blanking	
20	Ground	
21	Horizontal Sync	
22	Ground	
23	Vertical Sync	
24	No Connection	
25	Ground	
26	No Connection	

Video Feature (486SX)

Pin	Signal Name	I/O
1	Ground	I
2	Pixel Data 0	
3	Ground	I
4	Pixel Data 2	
5	Pixel Data 1	I
6	Pixel Data 3	
7	Ground	I
8	Pixel Data 4	O
9	Enable Ext Sync	I
10	Enable Ext Pixel Data	O
11	Enable Ext Pixel Clock	I
12	Pixel Data 5	O
13	No Connection	I
14	Pixel Data 6	
15	Ground	I
16	Pixel Data 7	
17	Ground	I/O
18	Pixel Clock	
19	Ground	
20	Blanking	
21	Ground	
22	Horizontal Sync	
23	No Connection	
24	Vertical Sync	
25	No Connection	
26	Ground	

Memory Module—30 Pin

Pin	Signal Name	I/O
1	+5 V dc	I
2	CAS	O
3	D0	I/O
4	A0	O
5	A1	O
6	D1	I/O
7	A2	O
8	A3	O
9	Ground	
10	D2	I/O
11	A4	O
12	A5	O
13	D3	I/O
14	A6	O
15	A7	O
16	D4	I/O
17	A8	O
18	A9	O
19	A10	O
20	D5	I/O
21	WE	O
22	Ground	
23	D6	I/O
24	No Connection	
25	D7	I/O
26	DP Out	I
27	RAS	O
28	CASP	O
29	DP In	O
30	+5 V dc	I

Memory Module—72 Pin

Pin	Signal Name	I/O
1	Ground	
2	SIMMD0	I/O
3	SIMMD0	I/O
4	SIMMD1	I/O
5	SIMMD1	I/O
6	SIMMD2	I/O
7	SIMMD2	I/O
8	SIMMD3	I/O
9	SIMMD3	I/O
10	+5 V dc	I
11	CASP	I
12	MA0	I
13	MA1	I
14	MA2	I
15	MA3	I
16	MA4	I
17	MA5	I
18	MA6	I
19	MA10	I
20	SIMMD4	I/O
21	SIMMD4	I/O
22	SIMMD5	I/O
23	SIMMD5	I/O
24	SIMMD6	I/O
25	SIMMD6	I/O
26	SIMMD7	I/O
27	SIMMD7	I/O
28	MA7	I
29	BS0	I
30	+5 V dc	I
31	MA8	I
32	MA9	I
33	RAS5	I
34	RAS4	I
35	DP0	I
36	DP0	I

Figure 18 (Part 1 of 2). Memory Module—72 Pin

Memory Module—72 Pin

Pin	Signal Name	I/O
37	DP1	I
38	DP1	I
39	Ground	I
40	BCAS0	I
41	BCAS2	I
42	BCAS3	I
43	BCAS1	I
44	RAS4	I
45	RAS5	I
46	BS1	I
47	AWE	I
48	Open	
49	SIMMD8	I/O
50	SIMMD8	I/O
51	SIMMD9	I/O
52	SIMMD9	I/O
53	SIMMD10	I/O
54	SIMMD10	I/O
55	SIMMD11	I/O
56	SIMMD11	I/O
57	SIMMD12	I/O
58	SIMMD12	I/O
59	+5 V dc	I
60	SIMMD13	I/O
61	SIMMD13	I/O
62	SIMMD14	I/O
63	SIMMD14	I/O
64	SIMMD15	I/O
65	SIMMD15	I/O
66	BS2	I
67	PD1	O
68	PD2	O
69	PD3	O
70	PD4	I
71	BS3	I
72	Ground	

Figure 18 (Part 2 of 2). Memory Module—72 Pin

PS/VP Computer Features

Note: In the following table, DD refers to Diagnostic Diskette type and S/B refers to Slots and Bays.

Model 6381

Type	Processor	DD	S/B	Memory	Hrd Dsk
6381/Si-F00	486SX-25	3	3/3	4M/64M	None
6381/Si-F30	486SX-25	3	3/3	4M/64M	120M
6381/Si-F50	486SX-33	3	3/3	4M/64M	212M
6381/Si-K00	486DX-33	3	3/3	4M/64M	None
6381/Si-K30	486DX-33	3	3/3	4M/64M	120M
6381/Si-K50	486DX-33	3	3/3	4M/64M	212M
6381/Si-W00	486DX2-33/66	3	3/3	4M/64M	None
6381/Si-W30	486DX2-33/66	3	3/3	4M/64M	120M
6381/Si-W50	486DX2-33/66	3	3/3	4M/64M	212M

Model 6382

Type	Processor	DD	S/B	Memory	Hrd Dsk
6382/S-F00	486SX-25	2	3/3	4M/64M	none
6382/S-F30	486SX-25	2	3/3	4M/64M	120M
6382/S-F50	486SX-25	2	3/3	4M/64M	245M
6382/S-F51	486SX-25	2	3/3	8M/64M	245M
6382/S-FY1	486SX-25	2	3/3	4M/64M	TokenRing
6382/S-FZ0	486SX-25	2	3/3	4M/64M	Ethernet/Twist
6382/S-FZ1	486SX-25	2	3/3	4M/64M	Ethernet/Coax
6382/S-K00	486SX-33	2	3/3	4M/64M	none
6382/S-K30	486SX-33	2	3/3	4M/64M	120M
6382/S-K50	486SX-33	2	3/3	8M/64M	245M
6382/S-K51	486SX-33	2	3/3	8M/64M	245M OS2
6382/S-KY0	486SX-33	2	3/3	4M/64M	TokenRing
6382/S-KZ0	486SX-33	2	3/3	4M/64M	Ethernet/Twist
6382/S-KZ1	486SX-33	2	3/3	4M/64M	Ethernet/Coax
6382/S-M00	486DX-33	2	3/3	4M/64M	none
6382/S-M30	486DX-33	2	3/3	4M/64M	120M
6382/S-M50	486DX-33	2	3/3	4M/64M	245M
6382/S-M51	486DX-33	2	3/3	8M/64M	245M OS2
6382/S-W50	486DX2-33/66	2	3/3	4M/64M	245M
6382/S-W51	486DX2-33/66	2	3/3	8M/64M	245M OS2

Model 6384

Type	Processor	DD	S/B	Memory	Hrd Dsk
6384-C00	386SLC-25	1	5/5	2M/16M	none
6384-C20	386SLC-25	1	5/5	2M/16M	80M
6384-C40	386SLC-25	1	5/5	2M/16M	170M
6384/D-F00	486SX-25	2	5/5	4M/32M	none
6384/D-G00	486SX-25	2	5/5	4M/32M	none
6384-F20	486SX-25	1	5/5	8M/32M	80M
6384/D-F30	486SX-25	2	5/5	8M/32M	120M
6384-F40	486SX-25	1	5/5	8M/32M	170M
6384/D-F50	486SX-25	2	5/5	4M/32M	245M
6384/D-F51	486SX-25	2	5/5	8M/32M	245M OS2
6384/D-G00	486SX-25	2	5/5	4M/32M	none
6384/D-G40	486SX-25	2	5/5	4M/32M	170M
6384/D-G41	486SX-25	2	5/5	8M/32M	170M
6384/D-G50	486SX-25	2	5/5	4M/32M	245M
6384/D-G53	486SX-25	2	5/5	8M/32M	245M OS2
6384/D-K02	486SX-33	2	5/5	4M/32M	none
6384/D-K30	486SX-33	2	5/5	4M/32M	120M
6384/D-K70	486SX-33	2	5/5	4M/32M	340M
6384/D-K71	486SX-33	2	5/5	8M/32M	340M OS2

Model 6384 (continued)

Type	Processor	DD	S/B	Memory	Hrd Dsk
6384/D-L00	486SX-33	2	5/5	4M/32M	none
6384/D-L40	486SX-33	2	5/5	4M/32M	170M
6384/D-L41	486SX-33	2	5/5	8M/32M	170M
6384/D-L50	486SX-33	2	5/5	4M/32M	245M
6384/D-L53	486SX-33	2	5/5	8M/32M	245M OS2
6384/D-M01	486DX-33	2	5/5	4M/64M	none
6384/D-M30	486DX-33	2	5/5	4M/64M	120M
6384-M40	486DX-33	1	5/5	8M/64M	120M
6384-M50	486DX-33	1	5/5	8M/64M	212M
6384/D-M70	486DX-33	2	5/5	8M/64M	340M
6384/D-M71	486DX-33	2	5/5	8M/64M	340M OS2
6384/D-N00	486DX-33	2	5/5	4M/64M	none
6384/D-N50	486DX-33	2	5/5	4M/64M	212M
6384/D-N51	486DX-33	2	5/5	8M/64M	212M
6384/D-N53	486DX-33	2	5/5	8M/64M	212M OS2
6384/D-N70	486DX-33	2	5/5	4M/64M	340M
6384/D-N73	486DX-33	2	5/5	8M/64M	340M OS2
6384/D-P60	Pentium-60	4	5/5	16M/128M	420M
6384/D-V00	486DX2-25/50	2	5/5	4M/64M	none
6384/D-V50	486DX2-25/50	2	5/5	4M/64M	212M
6384/D-V51	486DX2-25/50	2	5/5	8M/32M	212M
6384/D-V70	486DX2-25/50	2	5/5	4M/64M	340M
6384/D-V73	486DX2-25/50	2	5/5	8M/64M	340M OS2
6384/D-W01	486DX2-33/66	2	5/5	4M/64M	none
6384/D-W50	486DX2-33/66	2	5/5	4M/64M	245M
6384-W52	486DX2-33/66	1	5/5	4M/32M	212M
6384/D-W70	486DX2-33/66	2	5/5	4M/64M	340M
6384/D-W71	486DX2-33/66	2	5/5	8M/64M	340M OS2
6384/D-X00	486DX2-33/66	2	5/5	4M/64M	none
6384/D-X50	486DX2-33/66	2	5/5	4M/64M	212M
6384/D-X51	486DX2-33/66	2	5/5	8M/64M	212M
6384/D-X70	486DX2-33/66	2	5/5	4M/64M	340M
6384/D-X73	486DX2-33/66	2	5/5	8M/64M	340M OS2

Model 6387

Type	Processor	DD	S/B	Memory	Hrd Dsk
6387/T-M00	486DX-33	2	6/8	4M/64M	none
6387/T-M70	486DX-33	2	6/8	4M/64M	340M
6387/T-M71	486DX-33	2	6/8	8M/64M	340M
6387/T-N00	486DX-33	2	6/8	4M/64M	none
6387/T-N50	486DX-33	2	6/8	4M/64M	212M
6387/T-N70	486DX-33	2	6/8	4M/64M	340M
6387/T-N71	486DX-33	2	6/8	8M/64M	340M
6387/T-N73	486DX-33	2	6/8	8M/64M	340M OS2
6387/T-W00	486DX2-33/66	2	6/8	4M/64M	none
6387/T-W90	486DX2-33/66	2	6/8	4M/64M	527M
6387/T-W91	486DX2-33/66	2	6/8	8M/64M	527M OS2
6387/T-V00	486DX2-25/50	2	6/8	4M/64M	none
6387/T-V50	486DX2-25/50	2	6/8	4M/64M	212M
6387/T-V81	486DX2-25/50	2	6/8	8M/64M	420M
6387/T-V83	486DX2-25/50	2	6/8	8M/64M	420M OS2
6387/T-X00	486DX2-33/66	2	6/8	4M/64M	none
6387/T-X70	486DX2-33/66	2	6/8	4M/64M	340M
6387/T-X91	486DX2-33/66	2	6/8	8M/64M	527M
6387/T-X93	486DX2-33/66	2	6/8	8M/64M	527M OS2

Acronyms, Abbreviations and Terms

Term	Information
ACPA/A	Audio Capture and Playback Adapter
ADP	Automatic Data Processing
Alt	Alternate
ANSI	American National Standards Institute
ARTIC	A Real Time Interface Coprocessor
ASCII	American National Standard Code for Interface Interchange
AT	Advanced Technology (as in AT Bus)
AVC	Audio Video Connection
BIOS	Basic Input/Output System (Controls System Resources)
bps	Bits Per Second
BPS	Bytes Per Second
CCITT	The International Telephone and Telegraph Consultative Committee
CCS	Common Command Set
CCSB	Common Complete Status Block
CD	Compact Disc
CD-ROM	CD Read Only Memory (stores data/audio)
CE	Customer Engineer or Service Representative
CRC	Cyclic Redundancy Check
CRT	Cathode Ray Tube
CSD	Corrective Service Diskette
CGA	Color Graphics Adapter (See EGA, VGA, XGA)
CCSB	Configuration Control Sub Board)
CRC	Cyclic Redundancy Check
CRT	Cathode Ray Tube
CSA	Canadian Standards Association
CSD	Corrective Service Diskette
DASD	Direct Access Storage Device (hard disk, diskette)
DMA	Direct Memory Access
DRAM	Dynamic Random Access Memory
ECA	Engineering Change Announcement
ECC	Error Correction Code
EGA	Enhanced Graphics Adapter
ESD	Electrostatic Discharge
ESDI	Enhanced Small Device Interface
EEPROM	Electrically Erasable Programmable Read Only Memory
EWS	Energy Work Station
FRU	Field Replaceable Unit (replaceable part)
GPIB	General Purpose Interface Bus (IEEE 348)
GSA	General Services Administration
HMM	Hardware Maintenance Manual
HMR	Hardware Maintenance Reference
HMS	Hardware Maintenance Service
Ht	Height
IDE	Integrated Drive Electronics
IC	Integrated Circuit
IEEE	Institute of Electrical and Electronics Engineers
IEC	International Electrotechnical Commission
IML	Initial Machine Load
IPL	Initial Program Load
ISO	International Organization for Standardization
ISDN	Integrated-Services Digital Network
LAN	Local Area Network
LBA	Local Block Address
LTB	Local Transfer Bus

Term	Information
LUN	Logical Unit Number (as in SCSI)
MAP	Maintenance Analysis Procedure
MCGA	Modified Color Graphics Adapter (320 x 200 x 256)
MCA	Micro Channel Architecture (bus structure)
MHz	Mega hertz (millions of cycles per second)
MIDI	Musical Instrument Digital Interface
MM	Multimedia
N/A	Not Available or Not Applicable
NDD	National Distribution Division
NMI	Non-Maskable Interrupt
NSC	National Support Center
NVRAM	Non Volatile Random Access Memory
OEM	Original Equipment Manufacturer
PCMCIA	Personal Computer Memory Card International Association
POS	Programmable Option Select
PUN	Physical Unit Number (as in SCSI)
RAID	Redundant Array of Inexpensive Disks (disk array models)
RAM	Random Access Memory (read/write)
RGB	Red Green Blue (is in monitors)
ROM	Read Only Memory
SASD	Sequential Access Storage Device (Tape)
SCB	Subsystem Control Block
SRAM	Static Random Access Memory
SCSI	Small Computer Systems Interface
SCSI ID	SCSI Identification Number (assigned device number)
SPD	Software Product Description
SR	Service Representative
T/A	NDD Technical Advisor (See your Marketing Representative)
TDD	Telecommunications Device for the Deaf
TPF	ThinkPad File
UL	Underwriters Laboratory
VCA	Video Capture Adapter
VESA	Video Electronics Standards Association
VGA	Video Graphics Array (640x480x16)
VPD	Vital Product Data
VRAM	Video Random Access Memory
WORM	Write Once, Read Many Media
XGA	Extended Graphics Array (1024 x 768 x 256)
Y/C	Luminance/Chrominance Signal (Pertains to Video)

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Problem Determination Tips

Due to the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination. If possible, have this information available when requesting assistance from Service Support and Engineering functions.

- Machine type and model
- Failure symptom
    - What, when, where, single, or multiple systems?
    - Is the failure repeatable?
    - Has this configuration ever worked?
    - If it has been working, what changes were made prior to it failing?
- Reference Diskette Version
    - Type and revision level
- Hardware configuration
    - Print out (print screen) configuration from system partition or Reference Diskette currently being used.
- Operating system software
    - Type and revision level
    - OS/2 SYSLEVEL Command
- Software setup (appropriate to the software)
- CONFIG.SYS
- STARTUP.CMD
- AUTOEXEC.BAT

Important

To eliminate confusion, identical systems are considered *identical* only if they:

1. Are the exact machine type and models
2. Have the same adapters/attachments in the same locations
3. Have the same address jumpers/terminators/cabling
4. Have the same software versions and levels
5. Have the same Partition/Reference Diskette (version)
6. Have the same configuration options set in the system
7. Have the same setup for the operation system control files (Config.Sys, Autoexec.bat, Startup.Cmd., etc.)

Comparing the configuration and software set-up (Config.sys, etc.) between "working and non-working" systems will often lead to problem resolution.

Phone Numbers, U.S. and Canada

Before you place a call to the Support Center, refer to "Problem Determination Tips" on page 122.

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1-800-426-2472	IBM Customer Engineer Technical Support
1-800-426-7763	IBM National Support Center
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1-303-924-4015	IBM Part Number ID and look up
1-800-237-5511	IBM Software Defect Support (CSDs)
1-800-327-5711	IBM Software Ordering (service publications)
1-800-426-1484	IBM Supplies Technical Hotline
1-800-759-7483	IBM Warranty Claims Center
1-800-342-6672	OS/2 Replacement Diskettes (problems during new computer installation)

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1-800-426-8322	Customer Education Business Unit
1-800-999-0052	Customized Operational Services
1-407-982-6408	Developers Assistance (HW & SW)
1-800-964-8523	End User Support
1-800-772-2227	HelpCenter*
	HelpLearn*
	Customer Satisfaction Center
1-800-426-4238	HelpCenter* (TDD/ASCII)
1-800-742-2493	IBM Anti-Virus Services
1-800-447-4700	IBM Authorized Dealer Referrals
1-404-835-6600	IBM Bulletin Board
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1-800-426-2468	IBM Dealer Referral (typewriters/printers)
1-800-426-2468	IBM Direct (supplies, education)
1-800-282-0226	IBM Field Television Network
1-800-426-3333	IBM Information Referral Service
1-800-772-2227	IBM Service
1-800-426-7282	IBM Technical Manuals
1-800-426-9402 (Ext. 150)	Multimedia Information Center
1-800-241-1620	Multimedia Support
1-800-742-2493	Multivendor Consulting
1-800-342-6672	OS/2 Information Line
1-800-237-5511	OS/2 Support Center
1-800-237-5511	OS/2 Support Line
1-303-924-4125	Parts Information
1-800-284-5933	Prodigy** Service (link problems)
1-914-962-0310	Prodigy User Questions
1-800-237-4824	PS/2 Trade-In Program
	PS/2 Loan for Learning
	PS/2 Lease from IBM Credit

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1-800-547-1283	Technical Coordinator Program
	SystemXtra* for Personal Systems
	LAN Automated Distribution/2
	OS/2 Bulletin Board
	OS/2 Application Assistance Center
1-800-426-2622	Technical Services, Boca Raton (fee)
1-606-323-3000	Technical Support (typewriters/printers)
1-800-551-2832	Technical Solutions Magazine

IBM Canada Customer and Servicer Support

Number	Information
1-800-465-6600	Customer Relations
(416) 474-6666	Customer Relations - Toronto
1-800-465-6666	Customer Service Dispatch
1-800-263-2769	Customer Service Parts
1-800-465-2222	Customer Support Centre (ISC)
(416) 443-5701	Customer Service Repair Centre
1-800-465-1234	Helpcentre
1-800-465-7999	HelpClub* Registration
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(416) 492-1823	PS Bulletin Board - Toronto
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(604) 664-6466	PS Bulletin Board - Vancouver
1-800-661-7768	PS Marketing Support (PSMT)
1-800-465-1234	Publications Ordering
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(416) 443-5778	Warranty Claim Parts Enquiry
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