

FRONT

PICTURE 1

**ISA Internal and External
CD-ROM Drives**

June 1993

This package contains a supplement to the IBM *PS/2 Hardware Maintenance Manual* (part number 52G9971, form number S52G-9971-00) and IBM *PS/ValuePoint Hardware Maintenance Service and Reference Manual* (part number 61G1423, form number S61G-1423-00).

IBM, PS/2, and PS/ValuePoint are trademarks of the International Business Machines Corporation.

| Copyright International Business Machines Corporation 1993. All rights reserved. Note to U.S. Government users-Documentation related to Restricted rights-Use, duplication, or disclosure is subject to restrictions set forth in the GSA ADP Schedule Contract with IBM Corp.

Part Number 71G4115
Form Number S71G-4115-00

1.0 *ISA Internal and External CD-ROM Drives*

Subtopics

- 1.1 Laser Compliance Statement
- 1.2 General Information
- 1.3 Testing with the ISA CD-ROM Option Diskette
- 1.4 General Checkout
- 1.5 CD-ROM Diagnostic Tests (without Diagnostics Program)
- 1.6 CD-ROM Self Test
- 1.7 Checking the CONFIG.SYS and AUTOEXEC.BAT Files
- 1.8 Option Compatibility
- 1.9 Adapter Address Switch Settings
- 1.10 External Drive ID Switch Settings
- 1.11 Internal Drive ID Jumper Settings
- 1.12 External Drives Daisy Chaining
- 1.13 Parts
- 1.14 Notices

1.1 Laser Compliance Statement

The ISA CD-ROM drives are laser products. The optical drives have a label that identifies their classification. The label, located on the drives, is shown below.

PICTURE 2

The ISA CD-ROM drives are certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class I laser products. Elsewhere, the drives are certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 (1st edition 1984) and CENELEC EN 60 825:1991 for Class 1 laser products.

CAUTION:

Do not open the drive; no user adjustments or serviceable parts are inside.

Class I (1) laser products are not considered to be hazardous. The ISA CD-ROM drives contain internally a Class 1, 0.14 milliwatts laser, operating at 765 to 815 nanometers. These drives are not considered hazardous during normal operation, user maintenance, or service conditions.

1.2 General Information

This manual describes the diagnostic aids available to isolate and replace any failing Field Replaceable Unit (FRU) in the ISA External or Internal CD-ROM option.

```
+--- Important -----+
| The ISA CD-ROM drives operate ONLY in the horizontal orientation. Do |
| not test the CD-ROM drives in any other orientation.                 |
+-----+
```

1.3 Testing with the ISA CD-ROM Option Diskette

The diagnostics program is located on the option diskette shipped with the CD-ROM drive. The device driver installation program automatically copies the diagnostics program to the hard disk. This allows the diagnostics program to be run from the hard disk drive or option diskette.

To run diagnostic tests from the hard disk drive, the command to start the diagnostic tests must contain the drive letter and the name of the directory containing the diagnostics program. The following commands are for DOS and OS/2.

Operating System	Command
DOS	C:\CDROMDGS
OS/2	C:\OS2\CDROMDGS

Note: Before running the ISA CD-ROM Diagnostics program from the option diskette, be sure you have a backup copy of the option diskette. Keep the original in a safe place, and run the diagnostics program from the backup diskette.

1.4 General Checkout

The advanced diagnostic tests are intended to test *only* IBM products. Non-IBM products or modified options can give false errors and invalid responses.

```
+--- Important -----+
|
| The following additional elements may also be required:
|
|  DOS or OS/2 Operating System
|  ISA CD-ROM Option Diskette
|  Audio Compact Disc
|  Data Compact Disc
|  Headphones and/or Speakers
|
+-----+
```

Note: If more than one error code appears, diagnose the first error code received. The cause of the first error code can cause additional false error codes to appear.

The ISA CD-ROM drives operate **ONLY** in the horizontal orientation. Do not test the CD-ROM drives in any other orientation.

If you have multiple drives attached to the ISA External CD-ROM adapter, each drive must have a unique address, see "External Drive ID Switch Settings" in topic 1.10.

```
+---+
|001|
+---+
You should have a data disc available to test the CD-ROM read circuits.
The CD-ROM is a read-only device; it will not destroy the information on
the data disc.
You should have an audio disc and either headphones or speakers available
to test the CD-ROM audio circuits.
If you are instructed to configure the drive for self-test, refer to
"CD-ROM Self Test" in topic 1.6.
```

- Power-on the system and allow the operating system to boot normally.

ARE YOU RUNNING THE DIAGNOSTICS PROGRAM FROM THE HARD DISK DRIVE?

Yes No

```
|
| |
| +---+
| |002|
| +---+
| Insert the backup copy of the option diskette in drive A. At the
| command prompt, type A: CDROMDGS Then press Enter and go to Step
| 004.
|
```

```
+---+
|003|
+---+
```

- At the command prompt, type one of the following commands.

Note: If you have an operating system other than DOS or OS/2 see "Testing with the ISA CD-ROM Option Diskette" in topic 1.3.

<i>Operating System</i>	<i>Command</i>
DOS	C:\CDROMDGS
OS/2	C:\OS2\CDROMDGS

- Press **Enter**, then go to Step 004.

```
+---+
|004|
+---+
```

DID THE DIAGNOSTIC TESTS DETECT A FAILURE?

Yes No

```
|
| |
| +---+
| |005|
| +---+
| The ISA CD-ROM Diagnostic tests have completed successfully. If you
| suspect a problem, go to "CD-ROM Self Test" in topic 1.6.
|
```

```
+---+
|006|
+---+
```

Replace the failing FRU.

1.5 CD-ROM Diagnostic Tests (without Diagnostics Program)

Use this MAP only if you do not have the option diskette which comes with the ISA CD-ROM drive, or the CD-ROM diagnostic tests are not installed on the hard disk drive.

+----+
|001|
+----+

ARE YOU SERVICING AN EXTERNAL CD-ROM DRIVE?

Yes No

|
|
| +----+
| |002|
| +----+
| Go to Step 005.

+----+
|003|
+----+

- Power-on the external CD-ROM drive.

DID THE GREEN POWER LED ON THE CD-ROM YOU ARE SERVICING COME ON?

Yes No

|
| +----+
| |004|
| +----+
| Ensure that the power cord is properly seated at both ends.
| - or -
| If this does not fix the problem, replace the drive enclosure
| (external drives only).
| - or -
| If the problem remains, replace the drive.

+----+
|005|
+----+

- If you are servicing an external drive, power it off and then back on.
- Power-on the system.

DID THE CD-ROM DRIVE BUSY LIGHT COME ON BRIEFLY AND THEN GO OFF?

Yes No

|
| +----+
| |006|
| +----+
| Reseat the adapter and cables.
| - or -
| If the problem remains, go to "CD-ROM Self Test" in topic 1.6.

+----+
|007|
+----+

- Boot the operating system.

DID THE CD-ROM DEVICE DRIVER LOAD AND ASSIGN A DRIVE LETTER TO THE CD-ROM?

Yes No

|
| +----+
| |008|
| +----+
| Re-seat the CD-ROM adapter and cables.
| - or -
| Try a different adapter address. (Refer to "Adapter Address Switch
| Settings" in topic 1.9.)

Note: Changing the address may require a change to the address parameter in the CONFIG.SYS file. (Refer to "Checking the CONFIG.SYS and AUTOEXEC.BAT Files" in topic 1.7.)

- or -
| Try a different drive address. (Refer to "External Drive ID Switch Settings" in topic 1.10 or "Internal Drive ID Jumper Settings" in topic 1.11.)
| - or -
| If you are servicing an external CD-ROM, remove the CD-ROM enclosure and re-seat the 40-wire ribbon cable and the 4-wire power cable inside the enclosure.
| - or -
| If the problems remains, check the CONFIG.SYS and AUTOEXEC.BAT files. (Refer to "Checking the CONFIG.SYS and AUTOEXEC.BAT Files" in topic 1.7.)
| - or -
| If the problem remains, go to "CD-ROM Self Test" in topic 1.6.

```
|
+----+
|009|
+----+
- Press the drive eject button.
DID THE TRAY COME ALL THE WAY OUT?
Yes No
|
| +----+
| |010|
| +----+
| Eject the tray manually by inserting a paper clip into the hole
| located to the left of the eject button and check the drive for
| obstructions. (Objects prohibiting the tray from ejecting.) If none
| are found, replace the drive.
|
+----+
|011|
+----+
- Place a data CD in the drive tray.
- Either push the drive tray in, or press the eject button.
DID THE TRAY LOAD ALL THE WAY?
Yes No
|
| +----+
| |012|
| +----+
| Replace the drive.
|
+----+
|013|
+----+
- At the command prompt, type DIR followed by the drive letter assigned
to the CD-ROM drive you are testing.
DID THE SYSTEM DISPLAY THE DIRECTORY OF THE CD-ROM DRIVE.
Yes No
|
| +----+
| |014|
| +----+
| Try a different data CD.
| - or -
| If the problem remains, go to "CD-ROM Self Test" in topic 1.6.
|
+----+
|015|
+----+
- Load an audio CD into the drive.
- Using the customer's headphones or FRU No. 53F3610, connect the
headphones to the headphone jack, or the speakers to the jacks on the
back of the drive.

Note: For maximum volume and quality, the impedance of the speakers
must not be less than 10 ohms.

You can play the audio CD using either IBMCDPLY (DOS) or PLAYCD (OS/2).
- Set the manual volume control to 5 before playing the CD; then, adjust
the control up or down as needed.
DO YOU HEAR ANY SOUND?
Yes No
|
| +----+
| |016|
| +----+
| If you are servicing an external drive, replace the enclosure.
| - or -
| If you are servicing an internal drive, replace the adapter.
| - or -
| If the problem remains, replace the drive.
|
+----+
|017|
+----+
The ISA CD-ROM Diagnostic tests have completed successfully. If you
suspect a problem, go to "CD-ROM Self Test" in topic 1.6.
-----
```


1.6 CD-ROM Self Test

+----+
|001|
+----+

- Power-off the system.
- Disconnect the data cable from the drive.

ARE YOU SERVICING AN ISA EXTERNAL CD-ROM?

Yes No

| |
| |
| +----+
| |002|
| +----+
| Go to Step 004.
|

+----+
|003|
+----+

- Remove the ISA External CD-ROM cover.
- Remove the U-shaped jumper located inside the drive enclosure.
- Use the U-shaped jumper to connect bus-connector pins 14 and 17.

PICTURE 3

- Power-on the external CD-ROM drive, then go to Step 005.

+----+
|004|
+----+

- Use the drive-select jumper to connect data-cable connector-pins 13 and 14.

PICTURE 4

- Power-on the system, then continue with Step 005.

+----+
|005|
+----+

DID THE CD-ROM TRAY EJECT?

Yes No

| |
| |
| +----+
| |006|
| +----+
| Replace the CD-ROM drive.
|

+----+
|007|
+----+

- Load a disc into the drive.
- After a few seconds of testing, the drive will eject the disc.
- DID THE LED KEEP BLINKING, OR DID THE DRIVE FAIL TO EJECT THE DISC?**

Yes No

| |
| |
| +----+
| |008|
| +----+
| The CD-ROM Self Test has successfully completed. If you still
| suspect a problem, replace the following FRUs one at a time (in the
| order listed) until the problem goes away.

1. Data cable (external drive only)
2. Adapter
3. Data cable (internal drive only)
4. Enclosure (external drive only)
5. Drive

+----+
|009|
+----+

Replace the drive.

Note: Before re-starting the system, return the jumper to its original shipping position and re-attach the data cable.

1.7 Checking the CONFIG.SYS and AUTOEXEC.BAT Files

The statements required in the CONFIG.SYS and AUTOEXEC.BAT files depend on the operating system installed.

Subtopics

- 1.7.1 DOS
- 1.7.2 OS/2

1.7.1 DOS

The ISA CD-ROM INSTALL program automatically adds the following line to CONFIG.SYS file.

```
DEVICE=drive\path\CDROMDOS.SYS/D: IBMCD001
```

The definitions for the parameters used in the above line entry are as follows:

Parameter	Definition
drive	The drive letter of the drive the device driver is installed on.
path	The directory the device driver is installed in.
/D: drivename	Indicates the device-driver name. This MUST be the same as that used in the MSCDEX parameter in AUTOEXEC.BAT
/p: address	This parameter is only used when more than one ISA CD-ROM adapter is installed. This parameter matches a device driver name with the I/O port address on the adapter. The valid settings are 300, 310, 320, or 330. If necessary, refer to "Adapter Address Switch Settings" in topic 1.9. CONFIG.SYS MUST contain one entry for each adapter. For example, if the system has one ISA CD-ROM adapter at address 300 and one and 310, then CONFIG.SYS should have the following statements:

```
DEVICE=drive\path\CDROMDOS.SYS /D: IBMCD001 /P:300
DEVICE=drive\path\CDROMDOS.SYS /D: IBMCD002 /P:310
```

Note: Each adapter has a unique device-driver name.

The ISA CD-ROM UINSTALL program will also add the following statement to the AUTOEXEC.BAT file.

```
drive: \path\MSCDEX /D: IBMCD001 /M: 10
```

The definitions for the statement used in the above line entry are as follows:

Parameter	Definition
/D: drivename	Indicates the device-driver name. This MUST be the same as in CONFIG.SYS. If you have more than one adapter, you will need a /D parameter for each device driver name. In the example given above, you would need the following statement in AUTOEXEC.BAT.

```
MSCDEX.EXE /D: IBMCD001 /D: IBMCD002
```

Parameter	Definition
/L: driveletter	Determines what drive letter is assigned to the ISA CD-ROM. If this parameter is not specified, MSCDEX assigns the next available drive letter to the ISA CD-ROM.

```
MSCDEX.EXE /D: IBMCD001 /L: F
```

Parameter	Definition
/M: value	Tells MSCDEX.EXE how much memory to allocate for caching information on the CD-ROM. The default value is 10. This value reserves 20 KB (KB=1024 bytes).

Common Problems

1. CDROMDOS.SYS is not on the specified drive or path.
2. Device-driver name in CONFIG.SYS does not match the name in AUTOEXEC.BAT.
3. /P parameter does not match adapter switch settings.
4. /L parameter is already taken by another drive.
5. Two adapters might have the same switch settings or device driver names.

1.7.2 OS/2

The OS/2 2.0 DDINSTALL program adds the following lines to the CONFIG.SYS file:

```
DEVICE=drive\path\OS2CDROM.DMD /Q  
BASEDEV=ISACDOS2.ADD/M: 300  
IFS=drive\path\CDFS.IFS
```

The definitions of the parameters used in the above line entry are as follows:

Parameter	Definition
/M: address	I/O base port address of interface board. The valid settings are 300, 310, 320, and 330. If necessary, refer to "Adapter Address Switch Settings" in topic 1.9.
/Q:	Specifies quiet disconnect for OS2CDROM.DMD. If no drives are found during installation, /Q will disconnect the device driver and free-up additional memory.
/Q:	Specifies quiet mode for CDFS.IFS. This parameter inhibits messages during the device driver installation.

If you have more than one adapter, you will need two BASEDEV statements, one for each adapter. For example:

```
BASEDEV=CDROMOS2.ADD/M: 300  
BASEDEV=CDROMOS2.ADD/M: 310
```

Common Problems:

1. OS2CDROM.DMD is not on specified drive or path.
2. CDFS.IFS is not on the specified drive or path.
3. /M parameter does not match adapter switch settings.
4. Two adapters have the same switch settings.

1.8 Option Compatibility

The ISA CD-ROM drives are compatible with AT Bus systems.

1.9 Adapter Address Switch Settings

PICTURE 5

Address	Setting		Address	Setting
330 hex	Off Off 1 2		310 hex	On Off 1 2
320 hex	Off On 1 2		300 hex	On On 1 2

1.10 External Drive ID Switch Settings

PICTURE 6

Address	Setting Positions	Address	Setting Positions																
0	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> </table>					1	2	3	4	1	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> </table>					1	2	3	4
1	2	3	4																
1	2	3	4																
2	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> </table>					1	2	3	4	3	<table border="1"> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> </table>					1	2	3	4
1	2	3	4																
1	2	3	4																

1.11 Internal Drive ID Jumper Settings

PICTURE 7

Address	Setting Position	Address	Setting Position
0	: : :	1	: : :
2	: : :	3	: : :

1.12 External Drives Daisy Chaining

PICTURE 8

1.13 Parts

PICTURE 9

Index	Internal ISA CD-ROM	
1	Adapter	61G4110
2	Data Cable (40-wire ribbon cable)	61G4111
3	Drive	61G4109
4	Audio Cable	61G4112
Index	External ISA CD-ROM	
5	Drive Enclosure	61G4113
6	External Data Cable	61G4115
7	Adapter	61G4114
8	Drive	61G4109

1.14 Notices

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM product, program or service is not intended to state or imply that only IBM's product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any of IBM's intellectual property rights or other legally protectible rights may be used instead of the IBM product, program, or service. Evaluation and verification of operation in conjunction with other products, programs, or services, except those expressly designated by IBM, are the user's responsibility.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the IBM Director of Commercial Relations, IBM Corporation, Purchase, NY 10577.