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PICTURE 1

PICTURE 2

PICTURE 3

**IBM PS/2 Image Adapter/A
and Image-I Adapter/A
Supplement**

June 1993

Part Number 71G2238
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+--- Note -----+
|
| Before using this information and the product it supports, be sure to
| read the general information under "Notices" in topic 10.0.
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Second Edition (June 1993)

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1.0 *Product Description*

This section describes the Image Adapter/A and Image-I Adapter/A.

Subtopics

1.1 Image Adapter/A

1.2 Image-I Adapter/A

1.3 6091-019 Display Cable

1.1 Image Adapter/A

The Image Adapter/A is a high-resolution adapter, capable of driving displays at up to 128 MHz, with a maximum screen addressability of 1600 x 1200 pels.

The Image Adapter/A is available in three versions:

1. The Image Adapter/A 1MB is available with one megabyte of Video Memory (VRAM). It can be upgraded to three megabytes by the addition of an extra one megabyte of VRAM and the Image Adapter/A Memory Expansion Kit.
2. The Image Adapter/A 3MB has two megabytes of VRAM and the Image Adapter/A Memory Expansion Kit already installed.
3. The Image Adapter/A 3MB 6091 is the same as the Image Adapter/A 3MB, but also has a cable for attaching an IBM (*) 6091-019 Color Display.

The three versions of the Image Adapter/A support IBM analog displays equipped with a 15-pin direct-drive analog interface.

It can be installed in any IBM Personal System/2 (*) Micro Channel (*) system unit, except portable models.

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1.2 *Image-I Adapter/A*

The Image-I Adapter/A is a high-resolution adapter, capable of driving displays at up to 230 MHz, with a maximum screen addressability of 1600 x 1280 pels.

The Image-I Adapter/A is available in 3MB only and is International Organization for Standardization (ISO) enabled.

The Image-I Adapter/A supports only ISO refresh rates. It does not support non-ISO displays.

It can be installed in all IBM Personal System/2 system units except portable models.

1.3 6091-019 Display Cable

This cable is required if the Image Adapter/A or the Image-I Adapter/A is supporting an IBM Color Display 6091-019. The cable is supplied with the Image Adapter/A 3MB 6091. The cable must be ordered separately for all others (see "Parts" in topic 9.0).

Note: If you are using Image-I adapter/A with one of the following displays, use this table to match the display type to the correct cable.

Display Type	Cable Part Number	Description
6091-016 6091-19i	49G2717	IBM SIM cable (SIM connector to 5BNC)
9517 1091-051 FC9021	49G2718	IBM Connector Converter Cable (FC 5504)
1091-051 FC9020	-	No special cable needed

Note: Use of any non-IBM attachment cable might invalidate the Federal Communications Commission (FCC) certification.

2.0 Options

You can attach optional features to the Image Adapter/A to increase the range of applications. These optional features are supplied in a package with an Option Diskette and the appropriate *Installation Instructions*.

Note: Image-I Adapter/A has no optional features.

Subtopics

- 2.1 Image Adapter/A Printer/Scanner Option
- 2.2 Image Adapter/A Memory Expansion Kit
- 2.3 PS/2* Video Memory Expansion Option
- 2.4 Image Adapter/A Option Diskette
- 2.5 Video Graphics Array (VGA)

2.1 Image Adapter/A Printer/Scanner Option

The Printer/Scanner Option lets you attach a printer, or an optical scanner, or both. The Printer/Scanner Option adapter attaches to the Image Adapter/A and does not therefore occupy an expansion slot on the system unit. The connecting cables for these I/O devices are available as part of this option, or as separate items.

2.2 Image Adapter/A Memory Expansion Kit

The Memory Expansion Kit provides one MB of additional memory on eight "plug-in" modules. This memory is used by the drivers and device-attachment code that run on the Image Adapter/A. These memory modules plug into sockets on the Image Adapter/A.

2.3 PS/2 Video Memory Expansion Option*

This feature is available as an option on the Image Adapter/A 1MB, or as standard on the Image Adapter/A 3MB, and the Image Adapter/A 3MB 6091.

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2.4 Image Adapter/A Option Diskette

The Option Diskette, available separately, contains test procedures and configuration data for the following PS/2 and adapter configurations:

- PS/2 with Image Adapter/A 1MB
- PS/2 with Image Adapter/A 1MB and Printer/Scanner Option
- PS/2 with Image Adapter/A 3MB
- PS/2 with Image Adapter/A 3MB and Printer/Scanner Option
- PS/2 with Image Adapter/A 3MB 6091
- PS/2 with Image Adapter/A 3MB 6091 and Printer/Scanner Option

Special setup and test patterns for the attachment of the 6091-019 display are available on this diskette.

2.5 Video Graphics Array (VGA)

When you install the Image Adapter/A, system video is not disabled, and remains the primary display adapter. To display VGA video graphics on the display attached to the Image Adapter/A, install the adapter in the correct expansion slot so that VGA can be used from the system. (To identify the correct expansion slot for the system unit you are servicing, refer to the *Image Adapter/A Installation Instructions*.)

3.0 Display Adapter Compatibility

The Image Adapter/A and Image-I Adapter/A have been designed to coexist with the IBM PS/2 8514/A Display Adapter.

Subtopics

3.1 Video Palette Initialization

3.1 Video Palette Initialization

When the Image Adapter/A is installed, the video palette is initialized for the attached color or monochrome display.

Subtopics

3.1.1 Single Display

3.1.2 Dual Display

3.1.3 Adapter Mode

3.1.1 *Single Display*

For a single display configuration, you must always attach the display to the connector on the Image Adapter/A, and *not* to the system-unit display connector.

3.1.2 *Dual Display*

For a dual display configuration, you must attach the second display to the display connector on the system board. The display attached to the Image Adapter/A is the primary display and the Adapter Interface Code initializes the palette for this display. When a color display is attached to the VGA, or Image Adapter/A, the system uses the VGA color convention.

3.1.3 Adapter Mode

The Image Adapter/A mode determines the palette and the mode of operation of each display. The following table shows the possible combinations of the Image Adapter/A and VGA. The "System" column shows the modes that initialize the system palette for each combination.

Image Adapter/A	VGA	System
Color	Color	Color
Color	Monochrome	Color
Monochrome	Color	Color
Monochrome	Monochrome	Monochrome
Color	No Display	Color
Monochrome	No Display	Monochrome
No Display	Color	Color
No Display	Monochrome	Monochrome

4.0 Specifications

The following table shows the power requirements for each version of the Image Adapter/A, and for the Printer/Scanner option.

Image Adapter/A with:	Amps	Watts	Volts
1M byte VRAM	0.9	4.5	+5.0
1M byte VRAM and 1M byte DRAM	1.7	8.5	+5.0
2M byte VRAM and 1M byte DRAM	2.5	12.5	+5.0
When installed, Printer/Scanner option adds to the above.	0.6	3.0	+5.0

The following table shows the power requirements for the Image-I Adapter/A.

Image-I Adapter/A	Amps	Watts	Volts
3MB (ISO)	1.6	8.0	+5.0

5.0 Removals and Replacements

Note: These adapters are not repairable in the field. They must be returned in accordance with existing local procedures.

Subtopics

- 5.1 Installing PS/2 Video Memory Expansion Modules
- 5.2 Removing PS/2 Video Memory Expansion Modules
- 5.3 Installing Image Adapter/A Memory Expansion Modules
- 5.4 Removing Optional Feature Cards

5.1 *Installing PS/2 Video Memory Expansion Modules*

The Image Adapter/A has sockets for eight Video Memory Expansion Modules. The Module Insertion Guide supplied with the Image Adapter/A, clips over the sockets on the circuit board as shown.

PICTURE 4

1. Check that all the module contact pins are undamaged and correctly aligned.
2. Place the module in the Module Insertion Guide. Ensure that the beveled corner is in the position shown above by the small arrow.
3. Press down both ends of the module simultaneously to push the contact pins into the socket.
4. Check that the module is correctly seated in the socket.

5.2 Removing PS/2 Video Memory Expansion Modules

To remove PS/2 Video Memory Expansion Modules, you need the Module Removal Tool (Part Number 75X5893). If you are replacing a module, you need a PS/2 Video Memory Expansion Module (Part Number 75X5894).

Follow these instructions to remove each module:

1. Ensure that the Module Insertion Guide has been removed.
2. Push the Module Removal Tool over the center of the module until it clips onto the body of the module.
3. Hold the module firmly with the Module Removal Tool.
4. Press down on the circuit board with the other hand.
5. Pull the module upwards to detach it from the socket on the board.
6. Install the replacement module, following the installation instructions above.

5.3 Installing Image Adapter/A Memory Expansion Modules

A Dual-in-Line module-insertion tool (20 pin) is recommended to insert the modules.

1. Does the Image Adapter/A have an optional feature card attached?

Yes Go to "Removing Optional Feature Cards" on page 5.4.
 Complete the instructions then continue with step 2.

No Continue with step 2.

2. Ensuring that the notch on the memory module aligns with the notch on the module socket, install the memory modules in the socket positions shown.

PICTURE 5

3. If you have an Image Adapter/A option to install on the Image Adapter/A with the memory modules already installed (or you removed an optional feature card before fitting the modules), go to the instructions that came with the option. If no option is to be installed go to step 4.
4. Install the Image Adapter/A by firmly pressing it into the expansion-slot connector until it snaps into place. Ensure that the edge of the handle toward the front of the system unit is in the card-support bracket. Tighten the screw to complete the installation.

Refer to the *Image Adapter/A Installation Instructions* to reinstall cables and covers, and to test the Image Adapter/A and Image Adapter/A Memory Expansion Option.

5.4 Removing Optional Feature Cards

When replacing a defective card or installing additional memory, follow the instructions below to separate the optional feature card from the Image Adapter/A.

CAUTION:

Refer to the Safety Instructions that came with the adapter for the sequence of removing cables.

1. Power-off the system unit and all attached devices.
2. Unplug the system unit and all devices from the AC power source.
3. Remove the system-unit cover.
4. Before you touch the adapter, touch the metal frame of the system unit to discharge any static electricity in your body.
5. Note the location of the Image Adapter/A, then remove the expansion-slot screw at the back of the system unit and remove the Image Adapter/A from the expansion slot. (The adapter must be reinstalled in the same expansion slot.)
6. Separate the cards as follows:
 - a. With the assembly in a vertical position as shown in the following diagram, hold the Image Adapter/A and the attached option card firmly on the edges near connector A.
 - b. Rock the option card from side-to-side, while easing it away from the Image Adapter/A until the pins are clear of their connector.
 - c. Hold the Image Adapter/A and option card firmly on the edges near connector B.
 - d. Again rock the option card from side-to-side as in step 6b until the two cards separate.

PICTURE 6

7. Keep these instructions with the documentation that came with your system unit.

Notes:

1. If you are reinstalling the Image Adapter/A without an optional feature card, refer to the *Image Adapter/A Installation Instructions* to install the adapter in the system unit.
2. If you are reinstalling the Image Adapter/A with an optional feature card, go to step 3 in topic 5.3 of these installation instructions to install the adapter in the system unit.

6.0 Connector Information

The Image Adapter/A and the Image-I Adapter/A install in an expansion slot and connect to displays through cable connectors at the rear of the system unit.

Subtopics

- 6.1 Image Adapter/A Connector
- 6.2 Image-I Adapter/A Connector

6.1 Image Adapter/A Connector

The 15-pin analog video connector and the 36-pin I/O connector of the Image Adapter/A extend through the rear panel of the system as shown.

PICTURE 7

The following table shows the signals and corresponding pin numbers for the 15-pin analog video connector.

Pin	Color Mode	Monochrome Mode
1	Red Video	Reserved
2	Green Video	Video
3	Blue Video	Reserved
4	Display ID 2	Display ID 2
5	Self-Test	Self-Test
6	Red Ground	Reserved
7	Green Ground	Video Ground
8	Blue Ground	Reserved
9	+12 V fused	+12 V fused
10	Digital Ground	Digital Ground
11	Display ID 0	Display ID 0
12	Display ID 1	Display ID 1
13	External Hsync	External Hsync
14	External Vsync	External Vsync
15	Display ID 3	Display ID 3

Notes:

1. Some display connectors have fewer than 15 pins.
2. The 36-pin I/O-connector pin assignments only apply when an optional feature card is attached to the Image Adapter/A.

6.2 Image-I Adapter/A Connector

The SIM video connector of the Image-I Adapter/A extends through the rear panel of the system as shown.

PICTURE 8

The following table shows the signals and corresponding pin numbers for the SIM video connector.

Pin	Type	No Serial Interface	Serial Interface Captured Cable
C1	Coax	Red BNC	Red 75 Ohm Terminator
C2	Coax	Green BNC	Green 75 Ohm Terminator
C3	Coax	Blue BNC	Blue 75 Ohm Terminator
1	TP	ID Pin 2	ID Pin 2
2	TP	ID Pin 1	ID Pin 1 / Clk Out
3	TP	N/A	H.V.S.D.
4	Coax	Digital Ground	Digital Ground
5	Coax	Hsync BNC	Hsync
6	TP	ID Pin 4	ID Pin 4
7	TP	ID Pin 3	ID Pin 3 / Data
8	TP	N/A	N/A
9	Coax	Vsync BNC	Vsync
10	Coax	Digital Ground	Digital Ground

The following table shows pin assignments for the 6091-019 Video Cable, P/N 58F2902.

Connector P1 (15-pin D-type)	Label Designation	BNC Connector
1	R	Red Coax
2	G	Green Coax
3	B	Blue Coax
5		Red Coax Shield
7		Green Coax Shield
8		Blue Coax Shield
10		H, V, Shield
13	H	H Coax
14	V	V coax

The following table shows pin assignments for the OEM Scanner Cable, P/N 07F4411.

OEM Scanner Cable Socket	OEM Scanner Cable Plug
02	07
03	06
04	05
05	19
06	08
08	21
09	09
10	10
12	12
18	18
20	22
22	20
23	23
25	25

The following table shows pin assignments for the 3812 Printer Cable, P/N 07F4413.

3812 Printer Cable Socket Connector	3812 Printer Cable Plug Connector
02	02
03	09
04	04
05	11
06	06
08	13
09	08

The following table shows pin assignments for the Printer/Scanner Interface Y-Cable, P/N 07F4417.

Printer/Scanner Interface Card Connector	Printer/Scanner Interface Scanner Plug	OEM Scanner Cable Plug
01	02	07
02	22	20
03	09	09
04	20	22
05	12	12
06	25	25
07	23	23

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Image-I Adapter/A Connector

19	06	08
20	08	21
21	04	05
22	18	18
23	03	06
24	05	19
25	10	10
Printer/Scanner Interface Card Connector	Printer/Scanner Interface Printer Plug	3812 Printer Cable Plug
10	06	06
12	03	09
13	08	13
27	09	08
28	05	11
29	04	04
32	02	02
Printer/Scanner Interface Card Connector	Printer/Scanner Interface Printer Plug	4216 Printer Cable Plug
09	13	13
10	06	06
11	10	10
12	03	03
13	08	08
14	07	07
15	01	01
16	15	15
26	12	12
27	09	09
28	05	05
29	04	04
30	11	11
31	14	14
32	02	02

The following table shows pin assignments for the 4216 Printer Cable, P/N 75X2474.

4216 Printer Cable Socket Connector	4216 Printer Cable Plug Connector
01	01
02	02
03	03
04	04

IBM PS/2 Image and Image-I Adapter/A HMM
Image-I Adapter/A Connector

05	05
06	06
07	07
08	08
09	09
10	10
11	11
12	12
13	13
14	14
15	15

7.0 Diagnostic Information

The following diagnostic aids are available for the Image Adapter/A and the Image-I Adapter/A:

- Internal Self-tests
- Advanced Diagnostic Test

Internal Self-test: The diagnostic code in the ROM on the Image Adapter/A or the Image-I Adapter/A configures and tests the adapter during the Internal Self-test. If an Image Adapter/A or Image-I Adapter/A Internal Self-test error occurs, the system sounds one long beep followed by two short beeps and an 8-digit error code (0200XXXX to 0205XXXX) may also be displayed on the screen.

Advanced Diagnostic Test: When the VGA is being tested, the display attached to the Image Adapter/A or Image-I Adapter/A is not blank, although the test message implies that it is. The screen displays random patterns while the test is running.

1. Start the backup copy of the Reference Diskette. If you have not already copied the adapter Option Diskette data onto your Reference Diskette, do so now.
2. When the Advanced Diagnostic Test has started, the list of installed devices shows that the Image Adapter/A or Image-I Adapter/A is installed.
3. When the adapter tests are running, a menu is displayed on the screen.

Note: Image Adapter/A 1MB, Image Adapter/A 3MB, Image Adapter/A 3MB 6091, Image Adapter/A, Image-I Adapter/A, and Extended Image Adapter/A, are all referred to as "Image Adapter/A" on the main diagnostic menus.

You can run the adapter test or display the test patterns by following the instructions on the screen.

4. When the Advanced Diagnostic Test is running, the message panel confirms which type of adapter is being tested.
5. If the tests reveal a problem with the Image Adapter/A or Image-I Adapter/A, the system displays a 0200XXXX error code. This is the error code assigned to the Image Adapter/A and the Image-I Adapter/A. If an Optional Feature card (for example the Printer/Scanner Option) is attached to the Image Adapter/A, the error code is in the range 0201XXXX to 0205XXXX.

If the problem is in a memory module which is socketed, you see on the screen a graphic representation of the adapter identifying the location of the failing module. Replace this module using the information in the "Removals and Replacements" section on page 5.1 of this manual.

If the problem is in non-socketed memory or in the adapter card itself, remove all pluggable memory modules and install the replacement adapter card.

If you suspect a problem with any of the cables in the system, inspect for visible damage and check connections using the information contained in the pin assignment tables in this supplement.

8.0 Symptom-to-FRU-Index

The Symptom-to-FRU Index lists symptoms and errors and the possible causes. The most likely cause is listed first. Use this index to help you decide which FRUs you should have available for servicing.

An X in an error message can be any number.

Symptom/Error	FRU/Action
020001XX to 020003XX	Image Adapter/A - or - Image-I Adapter/A Memory Module DRAM or VRAM
020004XX	Memory Module DRAM or VRAM Image Adapter/A - or - Image-I Adapter/A
020005XX to 020010XX	Image Adapter/A - or - Image-I Adapter/A Memory Module DRAM or VRAM
0200XXXX (not listed above)	Image Adapter/A - or - Image-I Adapter/A System Board
020101XX to 020103XX	Printer/Scanner Option Image Adapter/A Memory Module DRAM or VRAM
020104XX	Memory Module DRAM or VRAM Printer/Scanner Option Image Adapter/A
020105XX to 020110XX	Printer/Scanner Option Image Adapter/A Memory Module DRAM or VRAM
Image Adapter/A Memory Test failure indicated by graphic representation of	Replace memory module (shown in graphic) adapter

9.0 Parts

Image Adapter/A	06G8224
Printer/Scanner Option	07F4403
Y-Cable	07F4417
Memory Module-DRAM	07F4407
Memory Module-VRAM	75X5894
6091-019 Display Cable	58F2901
OEM Scanner Cable	07F4411
3812-002 Printer Cable	07F4413
4216-020 Printer Cable	07F2474
Image-I Adapter/A	49G2720
SIM Cable	49G2717
Connector Converter Cable	49G2718

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