



Personal System/2
Model 30 286
Hardware Maintenance
Service

March 1991

This pamphlet contains procedures for isolating problems to a FRU, a Symptom-to-FRU Index, and a parts listing for the IBM Personal System/2 Model 30 286.

This pamphlet is intended to be used with the IBM Personal System/2 *Hardware Maintenance Reference* manual (part number 15F2190, form number S15F-2100-00) and the IBM Personal System/2 *Hardware Maintenance Service* manual (part number 15F2200, form number S15F-2200-00).

Part Number 91F9232
Form Number S15F-2192-01

Safety Information

Refer to the *Hardware Maintenance Service General Information* pamphlet for the following information:

- General Safety
- Electrical Safety
- Safety Inspection Guide.

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General Checkout

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

IMPORTANT:

- If more than one error code is displayed, diagnose the first error code first. The cause of the first error code can cause false error codes to be displayed.
- If an adapter or device consists of more than one FRU, an error code may 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.

To disable the power-on password, move the J13 jumper on the system board to the unused position.

001

- Check all signal cables and power cords.
- If you cannot load a diagnostics diskette, go to "Symptom-to-FRU Index."
- Load the Advanced Diagnostics diskette, and check for the following responses:
 1. Memory test
 2. One or two short beeps (press the F1 key if prompted)
 3. First diagnostic menu.

ARE ALL THREE RESPONSES CORRECT?

Yes No

002

Go to "Symptom-to-FRU Index."

003

(Step **003** continues)

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003 (continued)

IS THE INSTALLED DEVICES LIST CORRECT?

Yes No

004

Go to "Installed Devices."

005

– Run the diagnostic tests.

ARE THE TESTS SUCCESSFUL?

Yes No

006

Go to "Symptom-to-FRU Index."

007

You may have an intermittent problem.

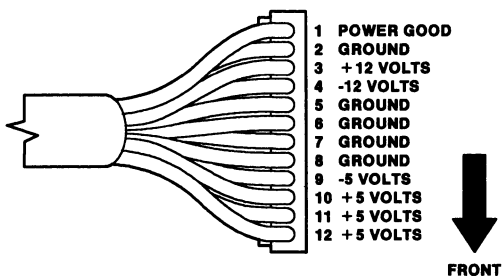
1. Check for damaged cables and connectors.
 2. Reseat all adapters, drives, and modules.
 3. Start an error log, and run the tests multiple times.
-

Undetermined Problem

1. Power-off the system.
2. Remove or disconnect one of the following devices or adapters:
 - a. Non-IBM devices
 - b. External devices (modem, printer, or mouse)
 - c. Math coprocessor
 - d. Any adapter
 - e. Bus adapter
 - f. Diskette drive cable
 - g. Fixed disk drive cable.
3. Power-on the system.
4. Repeat the previous steps until you find the failing adapter or device.

If all devices and adapters have been removed and the problem continues, check the power supply output voltages. If the output voltages are good, replace the system board; otherwise replace the power supply.

If the power supply fan is not running, replace the power supply.



V dc Minimum	V dc Maximum	-Lead Pin	+ Lead Pin
+ 4.8	+ 5.2	P7-5	P7-10
+ 4.5	+ 5.4	P7-9	P7-5
+11.5	+12.6	P7-5	P7-3
+10.8	+12.9	P7-4	P7-8

Memory

001

- Power-off the system and wait 5 seconds.
- Insert the Advanced Diagnostics diskette into drive A.
- Power-on the system.
- Make a note of any POST errors you receive.
- Disregard 164-Memory Size Errors. Press the **F1** key and continue with these steps.

DID YOU RECEIVE A XXXXXX XXXX 201 POST ERROR?

Yes **No**

002

- Run the memory tests. Use the RUN TESTS ONE TIME option.

DID THE MEMORY TESTS COMPLETE WITHOUT AN ERROR?

Yes **No**

003

Follow the instructions on the screen.

004

Your system memory is now functioning correctly. If you suspect an intermittent problem, start an error log.

005

- Replace pack A with a known good pack of the same size that is installed in the system (256KB and 1MB packs are not interchangeable).
 - If the problem remains, swap the pack removed from A with pack B.
 - If the problem remains, swap the pack removed from B with pack C.
 - If the problem remains, swap the pack removed from C with pack D.
 - If all memory packs have been swapped and 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 on the parallel port and run the advanced diagnostic tests to determine which of the following FRUs is failing:

- System board
- Parallel adapter
- Printer cable.

Installed Devices

If a device or adapter is not on the installed devices list, replace the device, adapter or cable. If the error remains, replace the bus adapter.

If an adapter is shown on the installed-devices list but is not in the system, remove the bus adapter. If the error remains, replace the system board.

Display Self-Test

1. Power-off the system unit and display.
2. Disconnect the display signal cable.
3. Power-on the display.
4. Turn the contrast to its maximum position.
5. Turn the brightness control to the center detent position.

The screen should be white with a black margin, as described below (some shading may occur near the edges). If the screen differs, replace the display. If the display passes the test, replace the system board or display adapter that the display is attached to.

- **8503, 8512, 8513, 8514, 8515:** 2 – 20 mm (0.08 – 0.79 in.) wide on one or both sides.
- **8506:** 2 – 35 mm (0.08 – 1.38 in.) wide on the top, or bottom, or both.
- **8507, 8508:** 2 – 20 mm (0.08 – 0.79 in.) wide on the top, or bottom, or both.
- **8604:** 2 – 20 mm (0.08 – 0.79 in.) wide, on all four sides.

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 when servicing a system.

Note: If you are using the Advanced Diagnostics diskette to determine what is actually failing, always begin with "General Checkout" on page 2.

If the system displays an error message and gives an incorrect audio response, the most likely causes are those listed for the error message. An X in an error message can be any number.

Symptom/Error	FRU/Action
No beep during POST	System Board Power Supply Memory Packs Any Adapter Bus Adapter Power Cord
One long and two short beeps during POST	System Board
Continuous beep	System Board
Blank or illegible display See "Display Self-Test" on page 7 before replacing any FRUs.	System Board Display Power Supply System Board Video Cable
Other display problems See "Display Self-Test" on page 7 before replacing any FRUs.	System Board Display Power Supply System Board Video Cable
Insert a Diskette icon	Diskette Drive System Board Diskette Cable Network Adapter
System loads BASIC or loads from fixed disk	Diskette Drive System Board Diskette Cable Network Adapter
Incorrect memory size during POST See "Memory" on page 5 before replacing any FRUs.	System Board

Symptom/Error	FRU/Action
110 See "Memory" on page 5 before replacing any FRUs.	Adapter Memory Bus Adapter System Board
111 See "Memory" on page 5 before replacing any FRUs.	Adapter Memory Bus Adapter System Board
Printer problems	See "Printer" on page 6.
Serial or parallel port device failure	Device Self-Test OK? Device Cable System Board Alternate Adapter Bus Adapter
XXXX ROM Error	Any Adapter
Some or all keys on the keyboard don't work.	Keyboard System Board Keyboard Cable
Real-Time Clock inaccurate	Clock Module System Board
161	Run Setup Clock Module System Board
162	Run Setup Clock Module System Board
163	Time and Date Set? Clock Module System Board
164 See "Memory" on page 5 before replacing any FRUs.	Run Setup System Board
199	See "Installed Devices" on page 6.
1XX	System Board
201 See "Memory" on page 5 before replacing any FRUs.	System Board
301	System Board Keyboard Keyboard Cable
3XX	Keyboard System Board Keyboard Cable

Symptom/Error	FRU/Action
6XX	Diskette Drive External Drive Adapter System Board Power Supply Diskette Cable
7XX	Math Coprocessor System Board
9XX	System Board
10XX	Alt. Parallel Adapter Bus Adapter
11XX	System Board
12XX	Alt. Serial Adapter Bus Adapter
13XX	Game Control Adapter Bus Adapter
14XX	See "Printer" on page 6.
17XX	Fixed Disk Drive System Board Fixed Disk Cable Power Supply
24XX	System Board Display System Board Video Cable
28XX	3278/79 Adapter Coaxial Cable Bus Adapter
30XX	PC Network Adapter LF Translator Cable Problem Bus Adapter
31XX	Alt. PC Network Adapter LF Translator Cable Problem Bus Adapter
36XX	GPIB Adapter Bus Adapter
38XX	DAC Adapter Bus Adapter
84XX	Speech Adapter Speech Control Assembly Bus Adapter
86XX	Mouse System Board

How To Use This Parts Catalog

INDEX REFERENCE NUMBERS: Refer to the illustrations for index reference numbers listed in the left margin of the parts listing.

SIMILAR ASSEMBLIES: If two assemblies contain a majority of identical parts, they are broken down on the same list. Parts peculiar to one or the other of the assemblies are listed separately and identified by description.

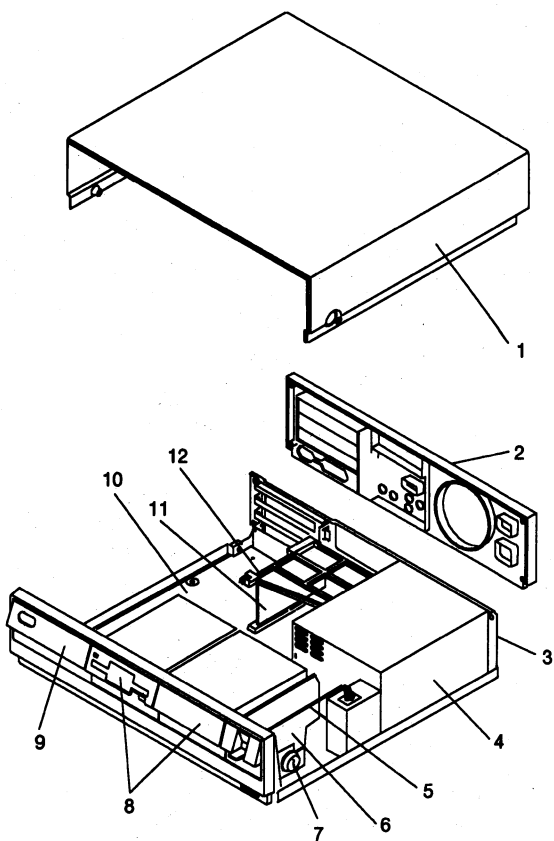
AR: (As Required) indicates that the quantity is not the same for all machines.

R: (Restricted) indicates that the part has a restricted availability.

INDENTURE the indenture is marked by a series of dots located before the parts description. The indenture indicates the relationship of a part to the next higher assembly. For example:

Indenture	Relationship of Parts
(No dot)	Main Assembly
(One dot)	• Detail parts of a main assembly
(One dot)	• Subassembly of the main assembly
(Two dot)	• • Detail part of a one-dot subassembly
(Two dot)	• • Subassembly of a one-dot subassembly

System Overview



Parts

Index	System Unit	
1	Top Cover	27F4172
2	Rear Cover	27F4174
3	System Base (with rubber feet)	27F4167
4	Power Supply, 120/230 V	27F4166
5	Power Switch Link and Lever	27F4168
6	Drive Cradle	27F4170
7	Cover Lock Assembly	27F4169
8	Blank Drive Bezel	72X7534
8	Diskette Drive Bezel (see Diskette Drive / Fixed Disk Drive)	
8	Fixed Disk Drive Bezel (see Diskette Drive / Fixed Disk Drive)	
9	Front Bezel (w/o Logo)	27F4173
	Front Cover Logo (R)	27F4249
	Back Panel (I/O Panel)	27F4229
10	System Board (Model E-21 only)	27F4069
10	System Board	34F0046
	System Board Clip	61X8933
	Memory Pack - 256KB ✓	1497256
	Memory Pack - 1MB ✓	74X8637
	Clock Module	8509237
11	Bus Adapter	27F4164
12	Bus Adapter Support	27F4165
	Support Bracket	61X8914
	Sliding Support Bracket	61X8926
	System Board Video Cable	27F4163
	80287 Math Coprocessor	72X8528
	Miscellaneous Parts Kit	27F4171
	• Captive Screw (Qty 4)	
	• Screw (Qty 5)	
	• Spring (Qty 4)	
	• Lock Slide Assembly (Qty 2)	

Diskette and Fixed Disk Drives

Diskette Drive 1.44MB (1/2 high)	72X8523
Diskette Drive Bezel (1/2 high)	27F4175
Diskette 1-Drive Cable (1/2 high)	27F4916
Diskette 2-Drive Cable (1/2 high)	34F0001
Diskette Drive 1.44MB (1/3 high) <i>site below</i>	33F8211
Diskette Drive Bezel (1/3 high)	27F4230
Diskette 1-Drive Cable (1/3 high)	27F4912
Diskette 2-Drive Cable (1/3 high)	34F0000
Diskette Drive Slide (1/3 high)	27F4917
Fixed Disk Drive, 20MB	6128285
Fixed Disk Drive, 30MB	6128279
Fixed Disk Drive, 45MB	92F0016
Fixed Disk Drive Bezel	27F4177
Fixed Disk Drive Cable	27F4178
5.25-Inch Diskette Drive:	
360KB External (4869-001)	72X6759
360KB External (4869-501)	72X6768
•Diskette Drive	72X6771
•Power Supply	72X6769
Adapter	72X6757
5.25-Inch External Diskette Drive Cable (from system board to adapter)	27F4211

64F4144 64F0162

PAL

$49K \frac{1}{3} 72X6068 = 27F4228$ pin conn.

30mb for 8525 = 6128279 RR

30mb for 8530 = 64F4144 RR

down lvl 6451030 NUPR
down lvl 11F8126 scrap

Options and Adapters

Data Acquisition Adapter	6181768
Data Acquisition Distribution Panel	6181769
Enhanced 5250 Emulation Adapter	30F5384
Game Control Adapter	8529151
GPIB Adapter	6181770
MIDI Adapter Unit	81X8624
PC Music Adapter	81X8620
PC Network Adapter	8286171
PC Network Adapter II	72X8105
PC Network Baseband Adapter	72X8101
PhoneCommunicator Adapter	33F4846
PhoneCommunicator Cable (Black-L)	57F1261
PhoneCommunicator Cable (Black-S)	57F1262
PhoneCommunicator Cable (Beige-L)	57F1263
PhoneCommunicator Cable (Beige-S)	57F1264
Printer Cable	8529214
PS/2 Multifunction Adapter	30F5447
• Memory Pack - 256KB	1497256
• Memory Pack - 1MB	74X8637
Screen Reader Adapter	33F4842
Screen Reader Keypad	1393515
Screen Reader Keypad Cable	72X8537
SpeechViewer Adapter	15F8511
• Test Plug (for 15F8511)	15F8512
SDLC Adapter	8286099
Communications Adapter Cable	8529274
Serial/Parallel Adapter	8286147
Serial Adapter Cable	8286170
Serial Adapter Connector	8286194
Speech Adapter	61X8921
Speech Control Unit	61X8934
Token Ring Adapter	16F0463
Token Ring 16/4 Adapter	25F8884
Token Ring RPL (Module)	83X7839
3278/3279 Emulation Adapter	8665792
80287 Math Coprocessor	72X8528

get new ones

Keyboard / Mouse

Arabic	1392014
Belgian	1392012
Canadian French	1392011
Danish	1392005
French	1392000
German	1392001
Hebrew	1392006
Italian	1392002
Norwegian	1392007
Portuguese	1392008
Spanish	1392003
Spanish / Latin	1392015
Swedish	1392009
Swiss / French / German	1392010
U.K. English	1392004
U.S. English	1392090
SolutionPac	1393390
Keyboard Cable (30 286)	27F4984
Mouse	61X8923
Mouse Ball and Pop-Off Retainer	33F8461
Mouse Ball and Twist-Off Retainer	33F8462

8503 Monochrome Display (with Tilt/Swivel Stand)

110/120 V ac	68X3045
220/240 V ac (Northern Hemisphere)	68X3046
220/240 V ac (Southern Hemisphere)	72X7878
Tilt/Swivel Stand	68X3061

8506 Monochrome Display (with Tilt/Swivel Stand)

110/125 V ac (US/Canada)	39F8087
110/125 or 200/240 V ac (Northern Hemisphere)	39F8088
110/125 or 220/240 V ac (Southern Hemisphere)	39F8089

8507 Monochrome Display (with Tilt/Swivel Stand)

110/120 or 220/240 V ac (Universal Model)	6247808
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8508 Monochrome Display (with Tilt/Swivel Stand)

110/125 V ac (US/Canada)	6247838
110/125 or 200/240 V ac (Northern Hemisphere)	39F8067
110/125 or 220/240 V ac (Southern Hemisphere)	39F8068

8512 Color Display (without Tilt/Swivel Stand)

110/120 V ac	61X8924
220/240 V ac (Northern Hemisphere)	61X8928
220/240 V ac (Southern Hemisphere)	61X8927
Tilt/Swivel Stand	61X8925

8513 Color Display (with Tilt/Swivel Stand)

110/120 V ac	68X3088
220/240 V ac (Northern Hemisphere)	72X7870
220/240 V ac (Southern Hemisphere)	72X7877
Tilt/Swivel Stand	68X3061

8514 Color Display (without Tilt/Swivel Stand)

110/120 V ac	75X5945
220/240 V ac (Northern Hemisphere)	75X5946
220/240 V ac (Southern Hemisphere)	75X5947
Tilt/Swivel Stand	75X5907

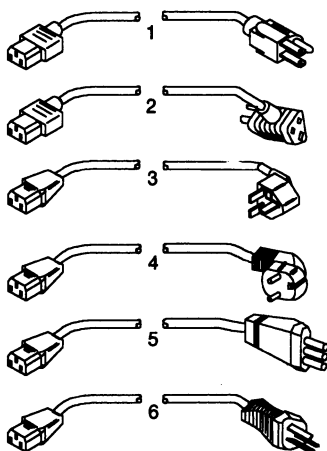
8515 Color Display (with Tilt/Swivel Stand)

90/137 V ac (U.S. and Canada)	38F3911
90/265 V ac (Northern Hemisphere)	38F3912
180/265 V ac (Southern Hemisphere)	38F3913
90/137 V ac (Japan, S.Korea, Taiwan)	38F3914

8604 Monochrome Display (with Tilt/Swivel Stand)

110/120 V ac	6398267
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Power Cords



Index Power Cords

Warning: Use the power cord certified for your country.

1	Power Cord, Displays (except 8514), for: Colombia, U.S., Venezuela	68X3071
2	Power Cord, System Unit, for: Colombia, U.S., Venezuela	62X1045
3	Power Cord, System Unit, for: Hong Kong, Singapore, U.K.	8529341
4	Power Cord, System Unit, for: France, Germany, Spain	8529281
5	Power Cord, System Unit, for: Italy	8529282
6	Power Cord, System Unit, for: Australia, New Zealand	8529284

Tools and Miscellaneous

Tri-Connector Wrap Plug	72X8546
Data Migration Connector Adapter	61X8936

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