



*Personal Computer
Hardware Reference
Library*

Hardware Maintenance and Service

0.5 to 3MB Memory

Expansion Adapter

55X3647



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First Edition (July 1986)

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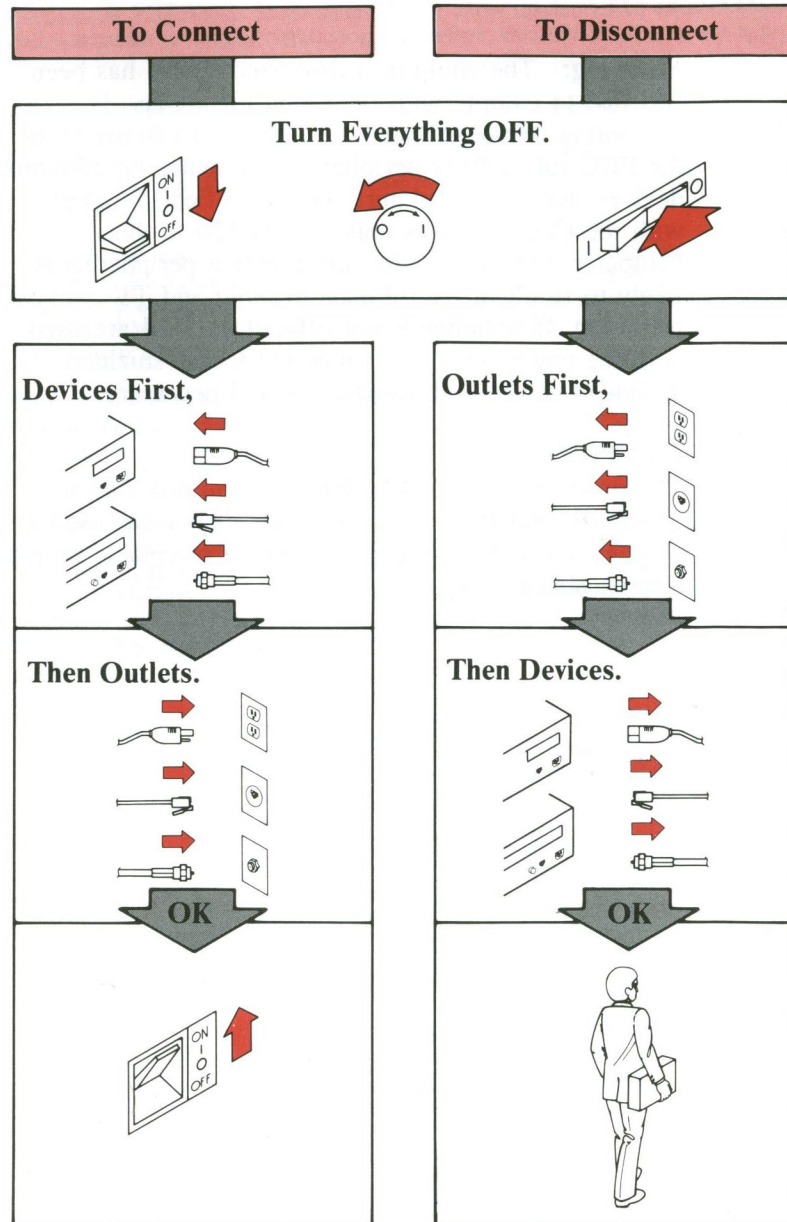
Warning: The equipment described herein has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of the FCC rules. Only peripherals (computer input/output devices, terminals, printers, etc.) certified to comply with the Class B limits may be attached to this computer. Operation with non-certified peripherals is likely to result in interference to radio and TV reception. If peripherals not offered by IBM are used with the equipment, it is suggested to use shielded grounded cables with in-line filters if necessary.

CAUTION

The products described herein are equipped with a grounded plug for the user's safety. It is to be used in conjunction with a properly grounded receptacle to avoid electric shock.

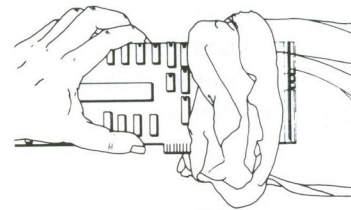
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Electrical current from power, telephone, and communications cables is hazardous. Connect and disconnect cables as shown when installing, moving, or opening the covers of personal computers or attached devices.

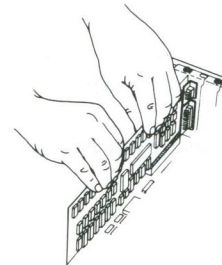


Handling Static-Sensitive Devices

Some of the components that make up to options for the system can be damaged by electrostatic discharges. To prevent this damage, the options are wrapped in a conductive, anti-static bag; certain precautions must be taken before removing an option from its bag:



Carefully remove the option from its anti-static bag. Be sure to grasp circuit boards by the edges only; do not touch the component pins or solder joints. Grasp diskette drives by their frames to avoid touching the electronics board. Grasp chips by their narrow ends only, not by their pins.



When inserting an option adapter into the system board, hold the adapter by its top edge or upper corners.

How to Use This Manual

The Hardware Maintenance and Service library consists of two diagnostic tools: this manual and the 0.5 to 3MB Memory Expansion Diagnostics, referred to in this manual as the Memory Expansion Diagnostics. The diagnostic programs are supplied with this manual on diskette.

The *Hardware Maintenance and Service* manual describes diagnostic procedures and their use for field replaceable units (FRUs), removal procedures, and provides general information about the 0.5 to 3MB Memory Expansion Adapter. Together with the Memory Expansion Diagnostics diskette, this manual makes it possible to diagnose a failing adapter. Maintenance Analysis Procedures (MAPs), jumper positions, switch settings, and a parts catalog are also contained in this manual.

The 0.5 to 3MB Memory Expansion Diagnostics diskette is designed to be used with MAPs to:

- Test different portions of the adapter (memory, serial port and parallel port)
- Automatically isolate problems to specific areas of the adapter through the use of error codes
- Verify correct installation and operation of the adapter

Preface

This manual provides the information needed to service the 0.5 to 3MB Memory Expansion Adapter. Readers should have received training on the 0.5 to 3MB Memory Expansion Adapter and the IBM Personal Computer AT. The reader should also be familiar with the Triplet Model 310 Multimeter or equivalent.

This manual is divided into six sections.

- **Section 1. "General Information,"** describes the adapter, its environmental specifications and special tools required for maintenance.
- **Section 2. "Introduction to Diagnostics,"** has the operating procedures for the POST and 0.5 to 3MB Memory Expansion Diagnostics. Also included are sample diagnostic screens that may be encountered during diagnostic testing.
- **Section 3. "Maintenance Analysis Procedures (MAPs),"** provides step-by-step instructions to isolate failing field replaceable units (FRUs).
- **Section 4. "Repair Information,"** shows the locations of various components on the adapter and provides the information needed to remove and replace FRUs.
- **Section 5. "Jumpers and Switches,"** describes the jumper and switch settings on the adapter.
- **Section 6. "Parts,"** contains illustrations and part numbers for the field replaceable units (FRUs).
- **Section 7. "Error Codes,"** contains a list of possible error codes and their meanings.

Operating instructions are in the *Guide to Operations* manual for the 0.5 to 3MB Memory Expansion Adapter. Detailed hardware and interface information is in the *Technical Reference* manual for the adapter.

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Section 1. General Information

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Notes:

Product Description

The IBM 0.5 to 3MB Memory Expansion Adapter is a powerful, versatile multifunction card for the IBM Personal Computer AT. It consists of a single board with the following features:

- Up to 3MB of memory
- A parallel printer port
- An asynchronous serial communications port.

The adapter comes with 0.5MB or 512KB of memory. Memory can be added to the adapter in increments of 512KB up to the maximum of 3MB.

The reliability and storage capacity of the adapter is achieved through a technology called single in-line packaging (SIP). Memory on the adapter is packaged in 256KB modules.

Up to five adapters can be installed in the IBM Personal Computer AT. These adapters can be used to fill the 15MB capacity of the expansion memory area in the computer.

Switch settings on an adapter determine the starting address of memory installed in the computer. A switch also determines whether or not the I/O ports on an adapter are enabled. For more information about the switch settings, refer to "Section 5. Jumpers and Switch Settings."

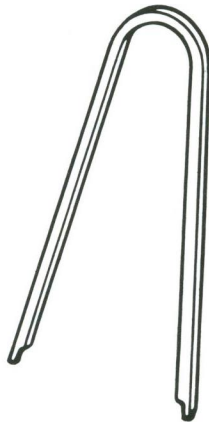
Special Tools

The following special tools are required to service the IBM Personal Computer AT.

A meter similar to the Triplet Model 310.¹

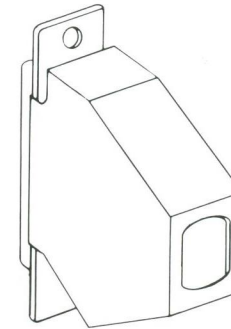
Module Puller

A tweezer-like module puller similar to the one shown below. (Used to remove the memory modules.)

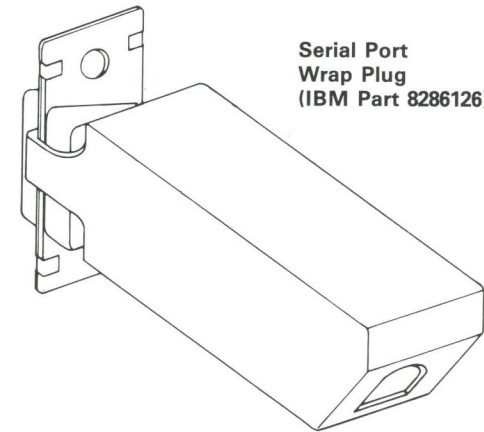


¹Manufactured by Triplet Corporation, Bluffton, Ohio 45817

Wrap Plugs



**Printer Adapter
Wrap Plug
(IBM Part 8529228)**



**Serial Port
Wrap Plug
(IBM Part 8286126)**

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Introduction

The main aids in isolation of a failing FRU are:

- Power-On Self Test (POST)
- Memory Expansion Diagnostics
- Maintenance Analysis Procedures (MAPs)

When the IBM Personal Computer AT is powered on, it automatically performs a series of system tests. This is called the POST. If an error code is received during the POST, a set of instructions is provided to isolate the cause of the error. These instructions are called a Maintenance Analysis Procedure (MAP). MAPs for different types of errors are contained in this manual and in the *Hardware Maintenance and Service* manual for your system unit.

Once the POST has completed, the programs on the Memory Expansion Diagnostics diskette can be run. These programs can be used for a number of purposes: disk formatting, system setup, system checkout, etc. System checkout initiates diagnostic tests in addition to those performed during the POST. These tests check out the memory as well as the serial/parallel ports on each 0.5 to 3MB Memory Expansion Adapter in the computer.

To isolate a failure the user follows a procedure described by a Start MAP. The Start MAP guides the user from the POST through system checkout in the Memory Expansion Diagnostics. An error code received during this procedure directs the user to one of the other MAPs. This manual contains six MAPs including the Start MAP, MAP 0200, and MAPs 0900-1200. MAP 0200 is used to resolve memory problems. MAPs 0900-1200 are used to resolve problems with the serial/parallel ports. All the MAPs in this manual are designed to resolve problems with the 0.5 to 3MB Memory Expansion Adapter. For other system problems, the user must reference MAPs in the Hardware Maintenance and Service manual for the system unit.

This section briefly describes the POST and Memory Expansion Diagnostics diskette. The MAPs are contained in the next section.

Power-On Self Test

Each time you set the system unit Power switch to On, the power-on self test (POST) is initiated. A comparison is made between the information entered in the Setup program and what the POST finds. The POST takes from 13 to 90 seconds to finish, depending on the options installed.

The POST checks the following:

- System board
- Memory
- Drive adapter
- Primary display
- Keyboard
- Diskette drives
- Fixed disk drives.

To start the POST:

1. Power on the system.
2. Turn the Brightness and Contrast knobs fully clockwise (IBM displays only).

The following will happen:

- The keyboard status lights blink on, then off.
- While the memory is being tested, the memory size appears in the top left corner of the screen and increases in 64K increments until the total system memory is tested.
- One short beep is heard when the POST is successfully completed.
- The IBM Personal Computer BASIC screen appears (if an operating system is not automatically loaded from diskette or fixed disk drive).

If the POST cannot be completed, and an error message appears on the display with the following message,

(RESUME = "F1" KEY)

press the F1 key; the system unit bypasses the error and attempts to complete the POST. The POST may or may not finish depending on the error.

Memory Expansion Diagnostics

Diskette

The Memory Expansion Diagnostics are on the diskette located in this manual. The Memory Expansion Diagnostics diskette and this manual should be used together to isolate failures on the IBM Personal Computer AT.

Notes

1. You should make a copy of this diskette and put the original in a safe place.
2. Some diagnostic tests require a write-protected diskette to be used. If you are using a copy of the original Memory Expansion Diagnostics diskette, be sure it is write-protected when running the diagnostic tests.

Starting the Memory Expansion Diagnostics Tests

Do the following to load the Memory Expansion Diagnostic tests.

1. Insert the Memory Expansion Diagnostics diskette into drive A.
2. Power on the system.¹
3. The Memory Expansion Diagnostics load after completion of the POST, and the Select an Option menu appears on the screen.
4. You are now ready to select and run the diagnostics test.

¹When instructed by the maintenance procedures to "Power on the system," apply power to all externally attached devices (such as displays, printers, plotters) and to the system unit.

Diagnostic Programs

The 0.5 to 3MB Memory Expansion Adapter comes with its own unique diagnostic diskette. The diagnostic program for the adapter contains an auto-diagnostic feature. Upon memory failure, the diagnostic program with proper input from the user, can isolate the failure down to a memory module on a particular adapter. This feature enables the user to isolate and repair a failure quickly.

Special Keys

Keys with special functions for the Memory Expansion Diagnostics are:

Key	Use
F1	Forces the system unit to bypass an error and continue with POST.
F7	Moves the screen message to the left (color displays only).
F8	Moves the screen message to the right (color displays only).
Ctrl + P	Directs screen output to the printer.
Ctrl + N	Cancels output to the printer.
Ctrl + C	Stops diagnostic tests and returns to the Installed Devices menu.
Ctrl + S	Stops diagnostic tests. Press any key to continue.
Shift + PrtSc	Prints what is on the screen (useful when the display is unreadable).

Diagnostic Menus

The following pages show the main diagnostic menus and describe what each menu selection does. Depending on the options installed, all of these menus may not appear on the screen.

Select an Option Menu

This menu appears first during the Memory Expansion Diagnostics.

```
SELECT AN OPTION

0 - SYSTEM CHECKOUT
1 - FORMAT DISKETTE
2 - COPY DISKETTE
3 - PREPARE SYSTEM FOR MOVING
4 - SETUP
9 - END DIAGNOSTICS

SELECT THE ACTION DESIRED
?_
```

0 - SYSTEM CHECKOUT: Starts the system checkout procedure.

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

2 - COPY DISKETTE: Copies the Memory Expansion Diagnostics diskette to another diskette.

3 - PREPARE SYSTEM FOR MOVING: Prepares the fixed disk drive(s) when moving the system.

4 - SETUP: Allows you to check or set the time, date, or system options.

9 - END DIAGNOSTICS: Loads the program from the diskette in drive A.

Installed Devices Menu

This menu displays the total amount of memory installed and the I/O ports enabled on the computer. The screen below is an example.

```
THE INSTALLED DEVICES ARE

2 - 3584KB MEMORY
9 - PRIMARY - PARALLEL PORT
10 - ALTERNATE - PARALLEL PORT
11 - PRIMARY - SERIAL PORT
12 - ALTERNATE - SERIAL PORT

IS THE LIST CORRECT (Y/N)
?
```

Y - Continues with system diagnostics.

N - Allows you to add or delete items from the Installed Devices menu.

Note: If you enter **N**, the screen displays the installed devices list error, **199**. Disregard this error and continue to add or delete the options. After correcting the list, answer **Y** to continue. If you are unable to correct the list, you still must answer **Y** to continue.

System Checkout Menu

This menu allows you to choose the number of times a test is run, use the error log, or end system checkout.

```
SYSTEM CHECKOUT
0 - RUN TESTS ONE TIME
1 - RUN TESTS MULTIPLE TIMES
2 - LOG UTILITIES
9 - END SYSTEM CHECKOUT

SELECT THE ACTION DESIRED
?_
```

0 - RUN TESTS ONE TIME: Runs the diagnostic tests once.

1 - RUN TESTS MULTIPLE TIMES: Runs the diagnostic tests as many times as you choose.

2 - LOG UTILITIES: Allows you to use the error log and time of day functions.

9 - END SYSTEM CHECKOUT: Returns to the Select an Option menu.

Installed Devices Test

This menu allows you to choose specific devices to test, or to test all of the devices listed. These devices include memory and the I/O ports.

```
2 - 3584KB MEMORY
9 - PRIMARY - PARALLEL PORT
10 - ALTERNATE - PARALLEL PORT
11 - PRIMARY - SERIAL PORT
12 - ALTERNATE - SERIAL PORT

SELECT OPTION NUMBER(S) TO TEST OR
PRESS "ENTER" TO SELECT ALL OPTIONS
?
```

Select the devices to be tested by entering their corresponding numbers, separated by commas or spaces. To test all options, just press Enter.

Log Utilities Menu

This menu allows you access to the error log.

LOG UTILITIES

- 0 - START ERROR LOG
- 1 - STOP ERROR LOG
- 2 - DISPLAY TIME OF DAY
- 9 - END LOG UTILITIES

SELECT THE ACTION DESIRED

?_

0 - START ERROR LOG: Starts a record of errors detected by diagnostic tests. You can choose to record the errors on a diskette or have them printed. If recording errors on a diskette, use a copy of the Memory Expansion Diagnostics diskette that is not write-protected.

Note: You cannot log errors to a diskette drive that is being tested. If you plan to test a diskette drive, you must log the errors to a diskette drive that is not being tested or to a printer.

1 - STOP ERROR LOG: Stops recording errors detected by diagnostic tests.

2 - DISPLAY LOG: The errors that were logged to the diskette are displayed on the screen.

3 - DISPLAY TIME OF DAY: If no time was set, the time elapsed since the diagnostic program was loaded is displayed.

9 - END LOG UTILITIES: Returns you to the System Checkout menu.

Other Diagnostic Screens

A number of screens appear in addition to the menu. Some of these screens require the user to enter information. Other screens report the results of diagnostic tests.

For example, the following sample screen requests information about the 0.5 to 3MB Memory Expansion Adapters in the system. The underlined numbers are those that were entered by the user.

ENTER THE NUMBER OF 0.5 TO 3MB MEMORY EXPANSION ADAPTERS INSTALLED IN THE SYSTEM. (1 TO 5): 1

ENTER SWITCH POSITIONS 1-5 (STARTING ADDRESS) (1 = ON; 0 = OFF; I.E., 11101 = ON,ON,ON,OFF,ON = 1MB STARTING ADDRESS)

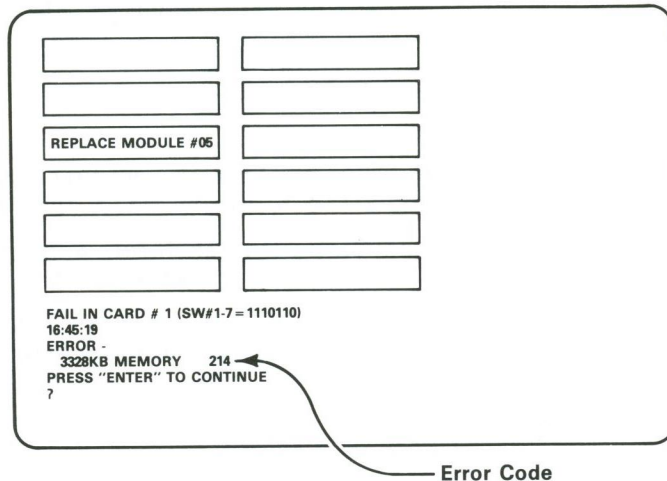
SW#1: 1 SW#2: 0 SW#3: 1 SW#4: 1 SW#5: 1

ENTER THE NUMBER OF MEMORY MODULE PAIRS INSTALLED ON THE ADAPTER. (1 TO 6): 1

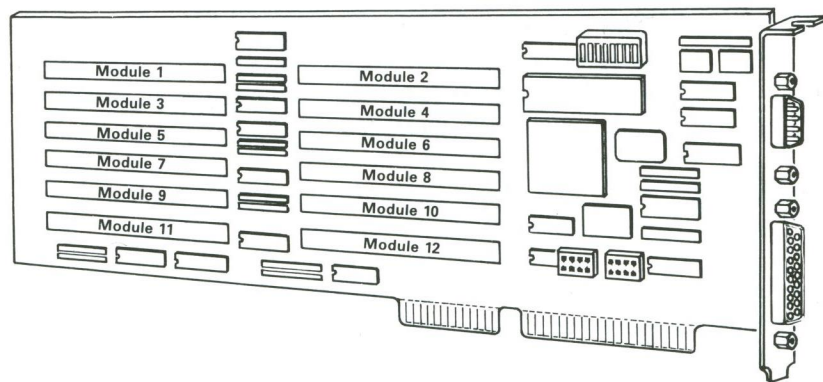
There are two important things to keep in mind about this screen:

- **1** indicates a switch is ON and **0** indicates that it is OFF.
- The number of memory modules installed on an adapter is entered in pairs. For example, for a fully populated adapter with 12 memory modules, the user would enter the number 6.

If a memory error is caused by a failed memory module, a screen like that shown below will appear. Each box on the screen corresponds to a memory module on an adapter. The screen highlights the failed memory module(s). The error code on the screen indicates the cause of the failure. Possible error codes are listed in Section 7 of this manual.



The following illustration shows how the memory modules on the adapter correspond to those on the screen.



System Checkout

Running System Checkout is the correct path for diagnosing any problem you encounter. We also recommend that you run the diagnostic tests every time a new adapter or memory module is installed or after any maintenance work is done on the system.

1. Load the Memory Expansion Diagnostics diskette into drive A.
2. Power on the system.
3. When the Select an Option menu appears, run SYSTEM CHECKOUT.
4. Next, the Installed Devices list appears. Check the list carefully. If any of the information in the list is incorrect, answer **N** to the question and correct the information. If the list is OK, answer **Y** to the question and continue.

Note: If you enter **N**, the screen displays the Installed Devices list error, **199**. Disregard this error. After correcting the list, press **Y** to continue. If you are unable to correct the list, you still must press **Y** to continue the diagnostic tests.

5. Next the System Checkout menu appears. From this menu, you have the choice of running tests one time or multiple times.
6. When you select either 1 or 2, the Installed Device menu appears. By selecting from this list, you can run tests on memory and/or the I/O ports in the computer. Press Enter to test all of the devices listed.

When running tests, if the last two digits in the return code are 00, this means that the test ran successfully.

For detailed descriptions of the System Checkout procedure, refer to the *Hardware Maintenance and Service* manual for your system unit.

Maintenance Analysis Procedures

(MAPs)

The MAPs are a series of steps that require you to answer questions and perform some actions. You will be able to determine which field replaceable unit (FRU) is causing the failure by following the MAPs and using the Memory Expansion Diagnostics diskette. You should always begin with the Start MAP. Depending on the failure indication, the Start MAP directs you to one of the other MAPs.

Error Log

The following steps will allow you to create an error log, run the diagnostic tests, and automatically record any error messages in an Error Log. This procedure is normally used when diagnosing an intermittent problem.

Creating the Error Log

1. Load the Memory Expansion Diagnostics diskette from drive A.
2. Press 0 (SYSTEM CHECKOUT) then Enter.
3. Depending on the options installed in the system, questions about attached devices will appear on the screen. Answer as required, then Enter.
4. Press Y or N (IS THE LIST CORRECT (Y/N)?) then Enter.
5. Press 2 (LOG UTILITIES) then Enter.
6. Press 0 (START ERROR LOG) then Enter.
7. Press 0 (LOG TO DISKETTE, OR PRINTER (0/1)?) then Enter.

The following appears only if you log to diskette.

8. Press A or B (ENTER THE DRIVE ID FOR ERROR LOG?) then Enter.

Note: You cannot log errors to a diskette drive that is being tested. If you plan to test a diskette drive, you must log the errors to a diskette drive that is not being tested or to a printer. If recording errors on a diskette, use a copy of the Memory Expansion Diagnostics diskette that is not write-protected.

9. Press 9 (END LOG UTILITIES) the Enter.

Starting the Test

1. Press 1 (RUN TESTS MULTIPLE TIMES) then Enter.
2. Select the device you suspect has a failure then press Enter.
3. Press N (WAIT EACH TIME AN ERROR OCCURS (Y/N)?) then Enter.
4. Follow any instructions on the screen and select all available tests.

End the Test and Display the Error Log

1. Press and hold the Ctrl key; then press the Break key.
2. Depending on the options installed in the system, questions about attached devices will appear on the screen. Answer as required, then Enter.
3. Press Y or N (IS THE LIST CORRECT (Y/N)?) then Enter.
4. Press 2 (LOG UTILITIES) then Enter.
5. Press 2 (DISPLAY LOG) then Enter.
6. Press A or B (ENTER THE DRIVE ID FOR ERROR LOG?) then Enter.
7. If no errors occurred, the Log Utilities menu appears. If errors are displayed, refer to the MAP indicated by the error code. If there is no corresponding MAP for the error code, go to "MAP 0000: Start."

Section 3. Maintenance Analysis Procedures (MAPs)

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MAP 0000: Start	3-0000-1
MAP 0200: Memory	3-0200-1
MAP 0900: Primary Parallel Port	3-0900-1
MAP 1000: Alternate Parallel Port	3-1000-1
MAP 1100: Primary Serial Port	3-1100-1
MAP 1200: Alternate Serial Port	3-1200-1

Notes:

MAP 0000: Start

This is the entry point for all MAPs. The MAPs will help you determine the failing memory module or serial or parallel ports on the 0.5 to 3MB Memory Expansion Adapters in your system.

The Memory Expansion Diagnostics program supplied with this manual is intended to test *only* the 0.5 to 3MB Memory Expansion Adapter. Non-IBM products, prototype cards, or modified options can give invalid errors and system responses.

All voltages in the MAPs are positive unless otherwise shown.

Before you begin:

1. Power off the system.
2. Ensure all connectors are installed correctly.
3. Ensure any jumpers or switches are set correctly.
4. Ensure the 115/230 Vac selector switch is set for the voltage available at the outlet.
5. Verify the options are correctly set by running the Setup program. After running the Setup program (or if you cannot run the Setup program) continue with Step 001.

001

(From Step 049 in this MAP)

- Insert the Memory Expansion Diagnostics diskette into drive A.
- Power on the system.

(Step 001 continues)

001 (continued)

IS THE POWER SUPPLY FAN RUNNING?

Yes No

|

002

Refer to the Service Manual for your system unit.

003

- Listen carefully for any audio responses during the POST.

DID YOU HEAR ONE SHORT BEEP AT THE END OF THE POST?

Yes No

|

004

Go to Step 006 in this MAP.

005

Go to Step 036 in this MAP.

006

(From Step 004 in this MAP)

DID YOU RECEIVE A 16X ERROR?

Yes No

|

007

Go to Step 011 in this MAP.

008

DID YOU RECEIVE A 161 ERROR?

Yes No

|

009

Go to Step 016 in this MAP.

010

Refer to the Service Manual for your system unit.

011

(From Step 007 in this MAP)

DID THE MESSAGE (RESUME = "F1" KEY) APPEAR ON THE SCREEN?

Yes No

|

012

Go to Step 060 in this MAP.

013

- Make a note of any error messages on the screen
- Press the F1 key to continue.

DID THE MESSAGE (RESUME = "F1" KEY) GO AWAY WHEN THE F1 KEY WAS PRESSED?

Yes No

|

014

Refer to the Service Manual for your system unit.

015

Go to Step 036 in this MAP.

016

(From Step 009 in this MAP)

- Make a note of any error messages on the screen.
- Press the F1 key.

DID THE MESSAGE (RESUME = "F1" KEY) GO AWAY WHEN THE F1 KEY WAS PRESSED?

Yes No

|

017

Refer to the Service Manual for your system unit.

018

Note: If you receive the message (MEMORY SIZE ERROR or MEMORY ERROR), press Enter.

(Step 018 continues)

018 (continued)

DID THE SELECT AN OPTION MENU APPEAR?

Yes No

| |

019

Refer to the Service Manual for your system unit.

020

- Select 4 (SETUP)
- Follow the instructions on the screen to run the Setup program.

DID YOU RECEIVE A 16X ERROR AFTER RUNNING THE SETUP PROGRAM?

Yes No

| |

021

Go to Step 036 in this MAP.

022

DID YOU RECEIVE ANY ERRORS IN ADDITION TO THE 16X ERROR?

Yes No

| |

023

Go to Step 025 in this MAP.

024

- Diagnose any errors other than a 16X first.

Go to the MAP indicated by the error code. For example, if you receive the error code 2XX, go to "MAP 0200: Memory." For MAPs not contained in this manual, refer to the Service Manual for your system unit.

Note: If you are unable to find the MAP that corresponds to your error code, you have an IBM device with its own service manual or a device not supported by IBM diagnostic tests.

025

(From Step 023 in this MAP)

- Check the switch settings on the 0.5 to 3MB Memory Expansion Adapters. (See Section 5 in this manual.)

ARE THE SWITCH SETTINGS CORRECT?

Yes No

| |

026

After correcting the switch settings, go to Step 020 in this MAP.

027

- Press F1 then Enter. When the Select an Option menu appears, select 0 (SYSTEM CHECKOUT).
- Follow the instructions on the screen and run all diagnostic tests one time. Use the (RUN TESTS ONE TIME) option.

DID YOU RECEIVE AN ERROR?

Yes No

| |

028

Go to Step 030 in this MAP.

029

Go to the MAP indicated by the error code. If you receive the error code 2XX, go to "MAP 0200: Memory." For MAPs not contained in this manual, refer to the *Hardware Maintenance and Service* manual for your system unit.

Note: If you are unable to find the MAP that corresponds to your error code, you have an IBM device with its own service manual or a device not supported by IBM diagnostic tests.

030

(From Step 028 in this MAP)

DID THE SYSTEM CHECKOUT MENU APPEAR AT THE END OF TESTING?

Yes No

|
|
031

Refer to the Service Manual for your system unit.

032

DID YOU NOTICE ANY FAILURE SYMPTOMS?

Yes No

|
|
033

Go to Step 035 in this MAP.

034

Go to Step 061 in this MAP.

035

(From Step 033 in this MAP)

The Memory Expansion Diagnostics have finished without detecting a failure.

- If you are still experiencing a failure:
 - Check all jumper positions
 - Check all switch settings
 - Check all cables and connectors for proper installation.

 - If you are experiencing a problem with a device other than the 0.5 to 3MB Memory Expansion Adapter, refer to that device's service manual for special testing instructions.

 - If you suspect an intermittent problem, start an error log. If you need instructions, refer to Section 2 in this manual.
-

036

(From Step 005 in this MAP)

(From Step 015 in this MAP)

(From Step 021 in this MAP)

DID THE SELECT AN OPTION MENU APPEAR?

Yes No

|
|
037

Go to Step 061 in this MAP.

038

- Select 0 (SYSTEM CHECKOUT).

DID THE INSTALLED DEVICES MENU APPEAR?

Yes No

|
|
039

You may have problems with your system unit. Please refer to the Service Manual for your system unit.

040

- Compare the list to the options installed *inside* of the system.

DOES THE INSTALLED DEVICES LIST CORRECTLY IDENTIFY THE MEMORY AND I/O PORTS INSTALLED INSIDE OF THE SYSTEM?

Yes No

|
|
041

Go to Step 043 in this MAP.

042

Go to Step 051 in this MAP.

043

(From Step 041 in this MAP)

Follow the instructions on the screen and attempt to correct the installed devices list.

Note: A 199 error indicates you answered "No" to the question about the installed devices list. Disregard the error.

COULD YOU CORRECT THE INSTALLED DEVICES LIST?

Yes No

044

Go to Step 046 in this MAP.

045

Go to Step 051 in this MAP.

046

(From Step 044 in this MAP)

IS THERE LESS MEMORY OR FEWER I/O PORTS IN THE DEVICE LIST THAN ARE ACTUALLY INSTALLED?

Yes No

047

Press Y (IS THE INSTALLED DEVICES LIST CORRECT?) then Enter to continue the diagnostic tests. Go to Step 049 in this MAP.

048

- Make sure all switches and jumpers are correctly set for the missing adapter. Be sure to check the system board video switch as well as the adapter switches and jumper positions.

(Step 048 continues)

048 (continued)**ARE THE SWITCHES AND JUMPERS SET CORRECTLY?**

Yes No

049

Reset any incorrect jumper or switch settings. Go to Step 001 in this MAP to verify system operation.

050

Refer to the Service Manual for your system unit.

051

(From Step 042 in this MAP)

(From Step 047 in this MAP)

- Follow the instructions on the System Checkout menu to run the tests one time. When the Installed Devices Test menu appears, select the options you want to test, or press Enter to run all tests.

Note: If you received a 199 error or you have an undetermined problem, run all tests.

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

052

Go to Step 054 in this MAP.

053

Go to the MAP indicated by the error code. For example, if you receive error code 2XX, go to "MAP 0200: Memory." For MAPs not contained in this manual, refer to the Service Manual for the system unit.

Note: If you are unable to find the MAP that corresponds to your error code, you have an IBM device with its own service manual or a device not supported by IBM diagnostic tests.

054

(From Step 052 in this MAP)

DID THE SYSTEM CHECKOUT MENU APPEAR AT THE END OF TESTING?

Yes No

055

Refer to the Service Manual for your system unit.

056**DID YOU NOTICE ANY FAILURE SYMPTOMS?**

Yes No

057

Go to Step 059 in this MAP.

058

Go to Step 061 in this MAP.

059

(From Step 057 in this MAP)

The Memory Expansion Diagnostics have finished without detecting a failure.

- If you are still experiencing a failure:
 - Check all jumper positions
 - Check all switch settings
 - Check all cables and connectors for proper installation.
- If you are experiencing a problem with a device not supported by this manual, refer to that device's service manual for special testing instructions.
- If you suspect an intermittent problem, start an error log. If you need instructions, refer to Section 2.

060

(From Step 012 in this MAP)

For error code 2XX, go to "MAP 0200: Memory." For MAPs that are not in this manual, refer to the Service Manual for your system unit.

061

(From Step 034 in this MAP)

(From Step 037 in this MAP)

(From Step 058 in this MAP)

If incorrect memory size displayed during POST or a PARITY CHECK occurred, refer to "MAP 0200: Memory." For MAPs that are not in this manual, refer to the Service Manual for your system unit.

Symptom Explanation	Conditions that Could Cause This Symptom
You have entered this MAP because you were unable to complete the POST, the memory size displayed was incorrect, there was a memory parity check, or you have an error message indicating a failure.	<ul style="list-style-type: none"> • A memory module is failing • A memory expansion option is failing • The system board is failing • The Setup program options are not correctly set.

001**DID YOU RECEIVE A 10-CHARACTER ERROR CODE?**

Note: If you also received a 164-Memory Size Error, run the Setup program and verify the memory size. If you receive a 164-Memory Size Error after attempting to correct the Setup program, disregard the error and continue with this MAP.

Yes	No
-----	----

	002

	Go to Step 004 in this MAP.
--	-----------------------------

003

Go to Step 019 in this MAP.

004

(From Step 002 in this MAP)

DID YOU RECEIVE A PARITY-CHECK MESSAGE?

Yes No

|

|

005

Go to Step 007 in this MAP.

006

Go to Step 056 in this MAP.

007

(From Step 005 in this MAP)

DID THE SELECT AN OPTION MENU APPEAR?

Yes No

|

|

008

Refer to the Service Manual for your system unit.

009

- Select 0 (SYSTEM CHECKOUT).

DOES THE AMOUNT OF MEMORY SHOWN IN THE INSTALLED DEVICES LIST MATCH THE AMOUNT INSTALLED IN THE SYSTEM?

Yes No

|

|

010

Go to Step 012 in this MAP.

011

Go to Step 015 in this MAP.

012

(From Step 010 in this MAP)

- Check the switch settings on all installed memory expansion adapters.

ARE THE SWITCH SETTINGS CORRECT?

Yes No

|

|

013

- Correct the switch settings and run the Setup program to verify the memory size.
- Power off the system.
- Insert the Memory Expansion Diagnostics diskette into drive A.
- Power on the system.
- Go to Step 001 in this MAP to verify system operation.

014

- Press "N" then Enter.
- Follow the instructions on the screen to correct the Installed Devices list.

Go to Step 017 in this MAP.

015

(From Step 011 in this MAP)

IS THE INSTALLED DEVICES LIST CORRECT?

Yes No

|

|

016

Follow the instructions on the screen to correct the installed devices list then go to Step 017 in this MAP.

017

(From Step 014 in this MAP)

(From Step 016 in this MAP)

- Run the Memory tests on the Memory Expansion Diagnostics Diskette. Use the (RUN TESTS ONE TIME) option.

(Step 017 continues)

017 (continued)

DID YOU RECEIVE A 10-CHARACTER ERROR CODE FOLLOWED BY 20X (XXXXXX XXXX 20X)?

Yes No

| |

018

Go to Step 054 in this MAP.

019

(From Step 003 in this MAP)

Find the first two characters of your error code in the following figure and take the action indicated.

First Two Digits of Error Code	Action
00, 01, 02, 03 . . .	Refer to the Service Manual for your system unit.
04, 05, 06, 07 . . .	Go to Step 039 in this MAP.
08, 09	Go to Step 048 in this MAP.
For error codes greater than 09 . .	Go to Step 020 in this MAP.

020

(From Step 019 in this MAP)

(From Step 034 in this MAP)

(From Step 041 in this MAP)

(From Step 050 in this MAP)

(From Step 053 in this MAP)

- Input the necessary information on the screen menu that appears after this error code. Refer to Section 2, "Other Diagnostic Screens" for a description of this screen.
- The next screen that appears describes each 0.5 to 3MB Memory Expansion Adapter in the system.

(Step 020 continues)

020 (continued)

IS THE INFORMATION ON THE SCREEN CORRECT?

Yes No

| |

021

- Enter "N" and press Enter. Repeat Step 020 to make the necessary corrections.

022

- Enter "Y" and press Enter.

DID THE FAILED MEMORY MODULE(S) APPEAR ON THE SCREEN?

Yes No

| |

023

Go to Step 036 in this MAP.

024

DOES THE SCREEN SHOW TWO FAILED MEMORY MODULES?

Yes No

| |

025

- Replace the failed memory module. (See "Other Diagnostic Screens" in Section 2 if you need help identifying the failed memory module on the adapter. See Section 4 for replacement procedures.)
- Go to Step 068 in this MAP.

026

HAVE YOU ALREADY REPLACED ONE OF THE FAILED MEMORY MODULES?

Yes No

| |

027

- Replace either of the failed memory modules. (See "Other Diagnostic Screens" in Section 2 if you need help identifying a failed memory module on the adapter. See Section 4 for replacement procedures.)
- Go to Step 033 in this MAP.

028

(Step 028 continues)

028 (continued)

HAVE YOU REPLACED BOTH OF THE FAILED MEMORY MODULES?

Yes No

029

- Reinstall the memory module that you replaced previously.
- Replace the other failed memory module.
- Go to Step 033 in this MAP.

030

DO YOU CURRENTLY HAVE REPLACEMENTS INSTALLED FOR BOTH FAILED MEMORY MODULES?

Yes No

031

- Replace the failed memory module that was reinstalled in the previous step. You should now have replacements installed for both failed memory modules.
- Go to Step 033 in this MAP.

032

- Replace the 0.5 to 3MB Memory Expansion Adapter.
- Go to Step 033 in this MAP.

033

DID THE POST RUN WITHOUT AN ERROR?

(From Step 069 in this MAP)

(From Step 027 in this MAP)

(From Step 029 in this MAP)

(From Step 031 in this MAP)

(From Step 032 in this MAP)

Yes No

034

Go to Step 020 in this MAP.

035

(Step 035 continues)

035 (continued)

Run the memory test on the Memory Expansion Diagnostics diskette to make sure your system memory is now functioning properly. If you suspect an intermittent problem, start an Error Log. If you need instructions, refer to "Section 2. Introduction to Diagnostics."

036

(From Step 023 in this MAP)

DID YOU RECEIVE THE MESSAGE "MEMORY FAILED IN THE EXPANSION MEMORY AREA OUTSIDE OF THE ADDRESS RANGE OF THE 0.5 TO 3MB MEMORY EXPANSION ADAPTERS"?

Yes No

037

Go to Step 064 in this MAP.

038

You probably have a failure in a memory expansion adapter other than the 0.5 to 3MB Memory Expansion Adapter. Please refer to the Service Manuals for the other memory expansion adapters you have installed in your system.

039

(From Step 019 in this MAP)

Compare switch positions 6 and 7 on the 0.5 to 3MB Memory Expansion Adapters in your system with those given below.

SW6 SW7

ON OFF

(Step 039 continues)

051

(From Step 049 in this MAP)

SW6	SW7
OFF	ON

DO SWITCH POSITIONS 6 AND 7 OF ANY OF THE 0.5 TO 3MB ADAPTERS MATCH THOSE ABOVE?

Yes	No
-----	----

052

Go to Step 045 in this MAP.

053

Go to Step 020 in this MAP.

054

(From Step 018 in this MAP)

DO YOU HAVE A PARITY CHECK ERROR MESSAGE?

Yes	No
-----	----

055

Your system memory is now functioning correctly. If you suspect an intermittent problem, start an Error Log. If you need instructions, refer to Section 2.

056

(From Step 006 in this MAP)

IS A FIVE-CHARACTER ERROR CODE DISPLAYED UNDER THE PARITY CHECK MESSAGE?

Yes	No
-----	----

057

Go to Step 061 in this MAP.

058

(Step 058 continues)

058 (continued)

IS THE FIRST CHARACTER OF THE ERROR CODE 0, 1, 2, 3, 4, 5, 6, 7, 8, OR 9?

Yes	No
-----	----

059

Go to Step 061 in this MAP.

060

Refer to the Service Manual for your system unit.

061

(From Step 057 in this MAP)

(From Step 059 in this MAP)

Parity Checks

Parity Check 1 indicates a system board parity error.

Parity Check 2 indicates a 0.5 to 3MB Memory

Expansion Adapter parity error. To isolate a parity failure:

- Power off the system.
- Remove all installed 0.5 to 3MB Memory Expansion Adapters.
- Power on the system.
- You may receive a 16X or 20X error message. Ignore the message and run the Setup program to ensure the memory size is correctly set.
- Power off the system and power it on again to perform the POST.

DID YOU RECEIVE A PARITY CHECK ERROR?

Yes	No
-----	----

062

Go to Step 064 in this MAP.

063

Refer to the Service Manual for your system unit.

064

(From Step 062 in this MAP)

(From Step 065 in this MAP)

- Power off the system.
- Install one 0.5 to 3MB Memory Expansion Adapter. Ensure switches are set correctly.

Note: If any 0.5 to 3MB Memory Expansion Adapter is not fully populated, install it last.

- Power on the system.
- You may receive a 16X or 20X error message. Ignore the message and run the Setup program to ensure the memory size is correctly set.
- Repeat the Memory tests in the Memory Expansion Diagnostics.

DID YOU RECEIVE A PARITY CHECK ERROR?

Yes	No
-----	----

065

Repeat the procedure in Step 064 in this MAP for each 0.5 to 3MB Memory Expansion Adapter. When all Memory Expansion Adapters have been installed, go to Step 067 in this MAP.

066

Replace all memory modules on the last adapter installed. If the same parity check error code occurs, replace the 0.5 to 3MB Memory Expansion Adapter.

067

(From Step 065 in this MAP)

You have successfully completed the Memory Expansion Diagnostics. If you suspect an intermittent problem, start an Error Log. If you need instructions, refer to Section 2 of this manual.

068**HAVE YOU ALREADY REPLACED THIS MEMORY MODULE?**

Yes	No
-----	----

069

Go to Step 033 in this MAP.

070

Go to Step 032 in this MAP.

If you have gone through the MAPs without solving your problem, use the following steps to help you find additional audio or visual symptoms.

- Power off the system.
- Check the system for loose or damaged memory modules and memory expansion adapters.
- Insert the Memory Expansion Diagnostics diskette into drive A.
- Power on the system.
- Select 0 (SYSTEM CHECKOUT)
- Select (LOG UTILITIES) and start an Error Log. Use the (RUN TESTS MULTIPLE TIMES) option. This will allow you to operate the system thoroughly and identify the failing symptom. When you have identified the symptom, go to "MAP 0000: Start" to isolate the problem.

If you have followed these procedures and still have an unsolved problem, request technical assistance.

Notes:

MAP 0900: 0.5 to 3MB Memory Expansion Adapter—Primary Parallel Port

Symptom Explanation	Conditions that Could Cause This Symptom
You have entered this MAP because you received a 9XX error code, you suspect a 0.5 to 3MB Memory Expansion Adapter—Primary Parallel Port problem, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The adapter assigned as the “Primary Parallel Port” is failing.

Ensure the following conditions exist:

1. An adapter is set for “Primary Parallel Port” operation.
2. If a second 0.5 to 3MB Memory Expansion Adapter is installed, it is set for “Alternate Parallel Port” operation.

Note: A description of “Primary Parallel Port” and “Alternate Parallel Port” addresses is contained in “Section 5. Jumpers and Switches.”

001

- Power off the system.
- Disconnect the printer cable if it is attached to the parallel port set for primary operation.
- Insert the Memory Expansion Diagnostics diskette in drive A.
- Run the Serial/Parallel-Parallel Port tests. Use the (RUN TESTS ONE TIME) option.
- Follow the instructions on the screen. Do not power off the system during this test.

Note: Use wrap plug (IBM Part 8529228) when instructed to install the wrap plug.

DID YOU RECEIVE AN ERROR MESSAGE?

Yes	No
-----	----

002

	You have successfully completed the Memory Expansion Diagnostics. If you suspect an intermittent problem, start an Error Log. If you need instructions, refer to Section 2 in this manual.
--	--

003

Replace the Primary Parallel Port (see Section 4 for replacement of the serial/parallel ports).

MAP 1000: 0.5 to 3MB Memory Expansion Adapter—Alternate Parallel Port

Symptom Explanation	Conditions that Could Cause This Symptom
You have entered this MAP because you received a 10XX error code, you suspect a 0.5 to 3MB Memory Expansion Adapter—Alternate Parallel Port problem, or you have been directed here from another MAP.	<ul style="list-style-type: none"> • The adapter assigned as the “Alternate Parallel Port” is failing.

Ensure the following conditions exist:

1. An adapter is set for “Primary Parallel Port” operation.
2. A second 0.5 to 3MB Memory Expansion Adapter is installed and is set for “Alternate Parallel Port” operation.

Note: A description of “Primary Parallel Port” and “Alternate Parallel Port” addresses is contained in “Section 5. Jumpers and Switches.”

001

- Power off the system.
- Disconnect the printer cable if it is attached to the parallel port set for primary operation.
- Insert the Memory Expansion Diagnostics diskette in drive A.
- Run the Serial/Parallel-Parallel Port tests. Use the (RUN TESTS ONE TIME) option.
- Follow the instructions on the screen. Do not power off the system during this test.

Note: Use wrap plug (IBM Part 8529228) when instructed to install the wrap plug.

DID YOU RECEIVE AN ERROR MESSAGE?

Yes	No
-----	----

002

	<p>You have successfully completed the Memory Expansion Diagnostics. If you suspect an intermittent problem, start an Error Log. If you need instructions, refer to Section 2 in this manual.</p>
--	---

003

	<p>Replace the Alternate Parallel Port (see Section 4 for replacement of the serial/parallel ports).</p>
--	--

MAP 1100: 0.5 to 3MB Memory Expansion Adapter—Primary Serial Port

Symptom Explanation	Conditions that Could Cause This Symptom
You have entered this MAP because you received a 11XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none"> • The Primary Serial Port is failing • The adapter cable is failing.

Ensure the following conditions exist:

1. A 0.5 to 3MB Memory Expansion Adapter is set for "Primary Serial Port" operation.
2. If a second serial port is installed, it is set for "Alternate Serial Port" operation.

Note: A description of "Primary Serial Port" and "Alternate Serial Port" addresses is contained in "Section 5. Jumpers and Switches."

001

- Power off the system.
- Insert the Memory Expansion Diagnostics diskette in drive A.
- Run the Serial/Parallel-Parallel Port tests. Use the (RUN TESTS ONE TIME) option.
- Follow the instructions on the screen. Do not power off the system during this test.

Notes:

1. Use wrap plug (IBM Part 8529808) when instructed to install the wrap plug on the cable.
2. Use wrap plug (IBM Part 8286126) when instructed to install the wrap plug on the adapter.

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

002

You have successfully completed the Memory Expansion Diagnostics. If you suspect an intermittent problem, start an Error Log. If you need instructions, refer to Section 2 in this manual.

003

WERE YOU INSTRUCTED TO REPLACE THE ADAPTER?

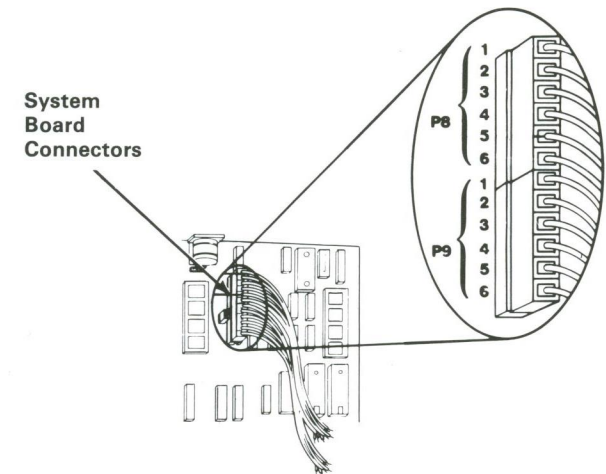
Yes No

004

Replace the adapter cable.

005

- Check for a voltage of -10.8 to -12.9Vdc between pins 4 and 5 (ground) of power connector P8.



DO YOU HAVE -10.8 TO -12.9 VDC BETWEEN PINS 4 AND 5?

Yes No

006

Refer to the Service Manual for your system unit.

007

Replace the Primary Serial Port. (See Section 4 for replacement of the serial/parallel ports.)

Notes:

MAP 1200: 0.5 to 3MB Memory Expansion Adapter—Alternate Serial Port

Symptom Explanation	Conditions that Could Cause This Symptom
You have entered this MAP because you received a 12XX error code, or you have been directed here from another MAP.	<ul style="list-style-type: none">• The Alternate Serial Port is failing• The adapter cable is failing.

Ensure the following conditions exist:

1. A 0.5 to 3MB Memory Expansion Adapter is set for “Primary Serial Port” operation.
2. A second 0.5 to 3MB Memory Expansion Adapter is installed and is set for “Alternate Serial Port” operation.

Note: A description of “Primary Serial Port” and “Alternate Serial Port” addresses is contained in “Section 5. Jumpers and Switches.”

001

- Power off the system.
- Insert the Memory Expansion Diagnostics diskette in drive A.
- Run the Alternate Serial/Parallel Adapter-Serial Port tests. Use the (RUN TESTS ONE TIME) option.
- Follow the instructions on the screen. Do not power off the system during this test.

(Step 001 continues)

001 (continued)

Notes:

1. Use wrap plug (IBM Part 8529280) when instructed to install the wrap plug on the cable.
2. Use wrap plug (IBM Part 8286126) when instructed to install the wrap plug on the adapter.

DID YOU RECEIVE AN ERROR MESSAGE?

Yes No

|

002

You have successfully completed the Memory Expansion Diagnostics. If you suspect an intermittent problem, start an Error Log. If you need instructions, refer to Section 2 in this manual.

003

(Step 003 continues)

003 (continued)

WERE YOU INSTRUCTED TO REPLACE THE ADAPTER?

Yes No

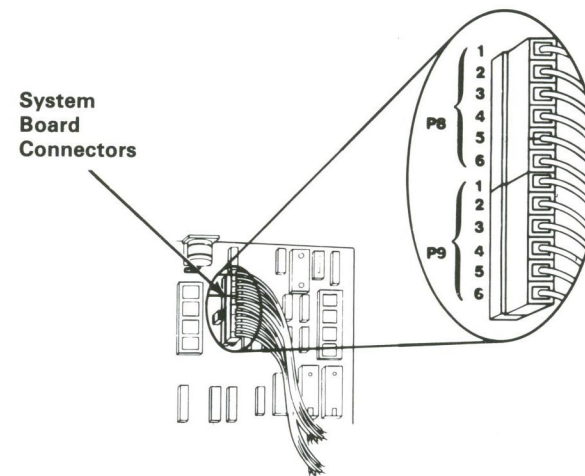
|

004

Replace the adapter cable.

005

- Check for a voltage of -10.8 to -12.9Vdc between pins 4 and 5 (ground) of power connector P8.



DO YOU HAVE -10.8 TO -12.9 VDC BETWEEN PINS 4 AND 5?

Yes No

|

006

Refer to the Service Manual for your system unit.

007

Replace the Alternate Serial Port. (See Section 4 for replacement of the serial/parallel ports.)

Notes:

Section 4. Repair Information

Contents

How to Use the Repair Information	4-3
Safety Grounds	4-4
System Unit Power Supply	4-4
Removals and Replacements	4-5
Cover 1005	4-5
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Memory Modules 1025	4-8
Serial/Parallel Ports on the Adapter 1035	4-10

Notes:

How to Use the Repair Information

This section contains the necessary information to repair the 0.5 to 3MB Memory Expansion Adapter.

Each removal for a field replaceable unit (FRU) has a reference number next to the title of the procedure. When a step is explained fully by another procedure, you can refer back to that procedure by using the reference number in parentheses.

For example:

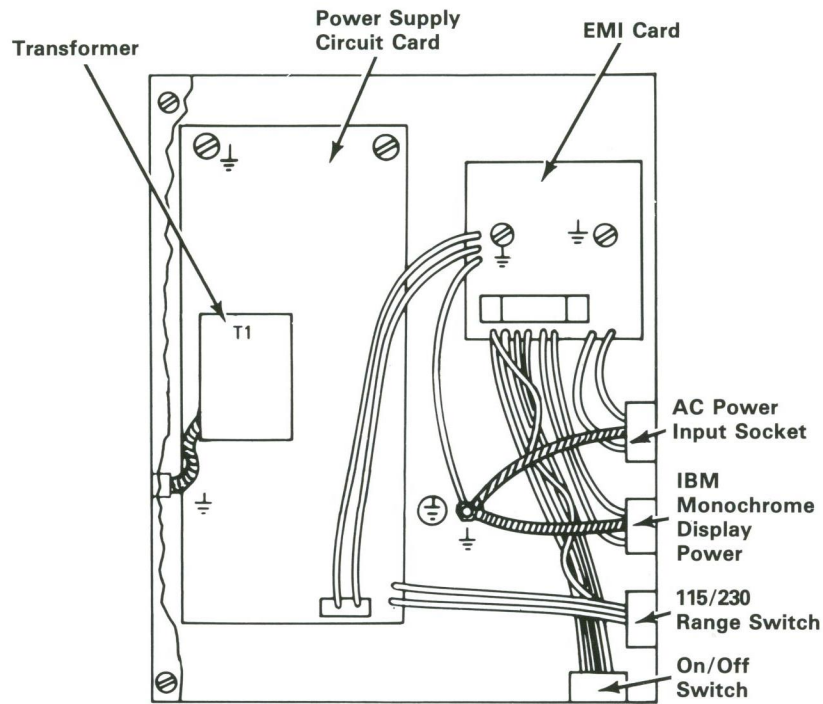
1. Power off the system.
2. Remove the system unit cover (1005).
3. Make a note of which slot the adapter is in.

In the example, Step 2 has the reference number 1005, which means the complete instructions for removing the system unit cover are in procedure 1005. The steps after Step 2 are based on the assumption that you followed the specified procedure.

To replace a FRU, reverse the removal procedure and follow any notes that pertain to replacement.

Safety Grounds

System Unit Power Supply

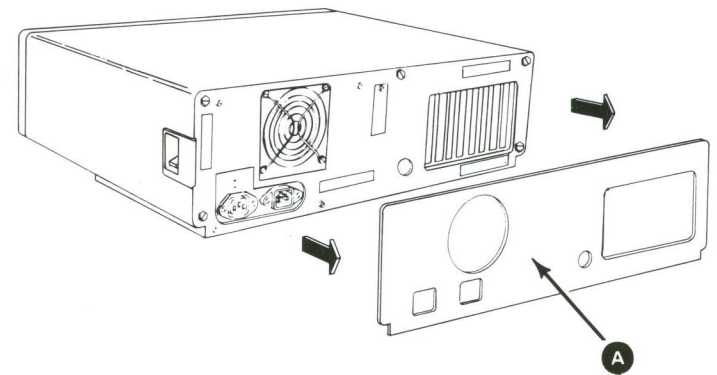


Legend

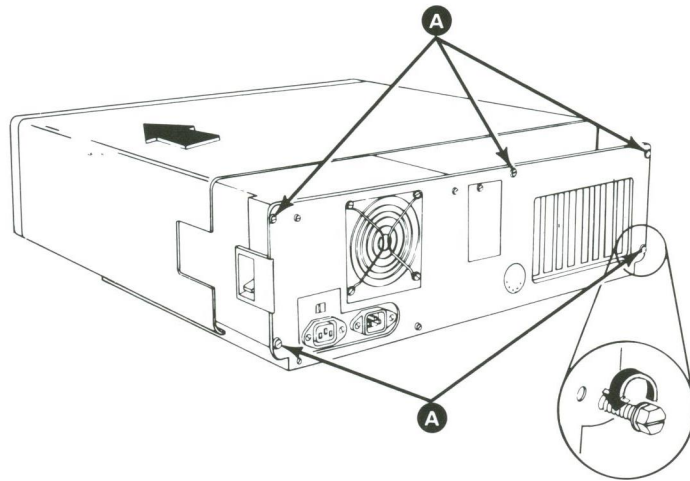
Removals and Replacements

Cover 1005

1. Power off the system.
2. Unplug the power cord from the outlet.
3. Move all external options away from the system unit.
4. Turn the key to the unlocked position and remove it.
5. Turn the system unit around, as shown.
6. Remove the back panel **A** from the rear of the system unit. The back panel is attached to the system unit by plastic fastener strips.



7. Remove the five cover mounting screws **A** .
8. Slide the cover away from the rear panel until it is clear of the system unit.

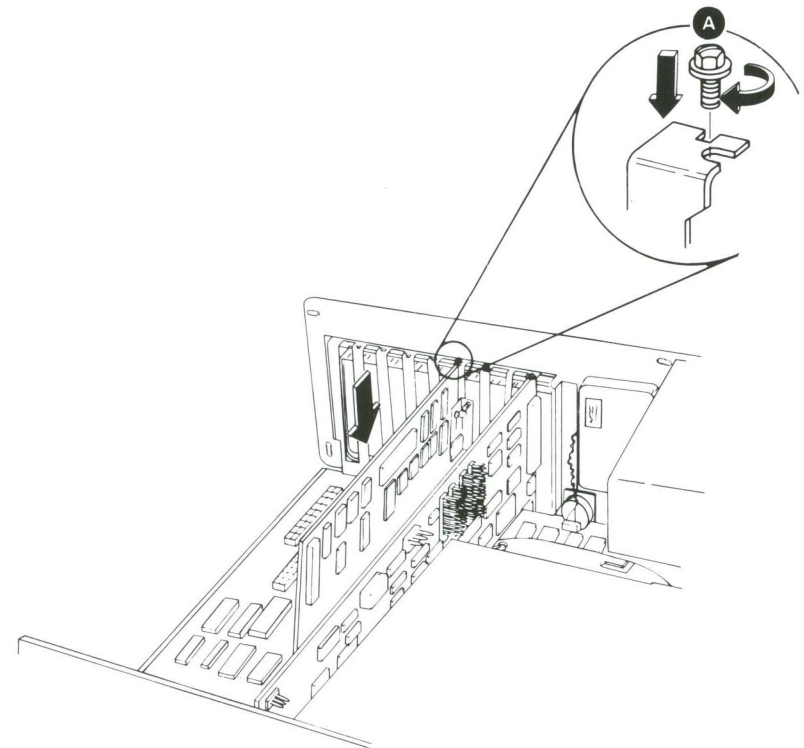


0.5 to 3MB Memory Expansion Adapter 1015

1. Power off the system.
2. Remove the system unit cover (1005).
3. Make a note of which slot the adapter is in.
4. Make a note of the location of any cables attached to the adapter, then remove them.
5. Remove the adapter mounting screw **A** .
6. Grasp the adapter by the top corners and lift straight up.

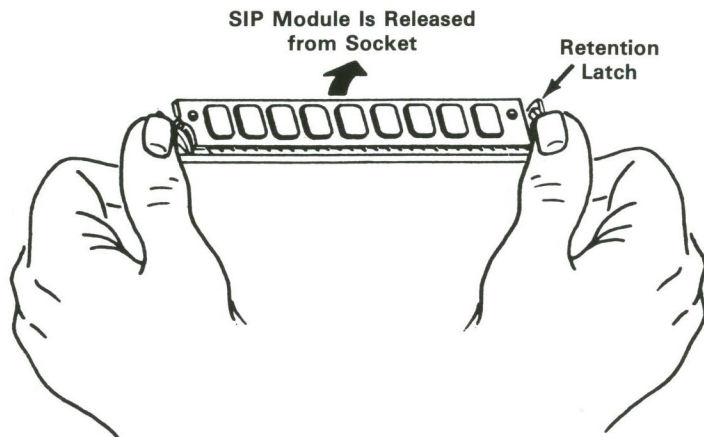
Note: When removing adapter, follow only steps 1-6. When replacing the serial/parallel ports, follow steps 7-9 before reversing steps 1-6.

7. Remove the memory modules from the adapter (1025).
8. Install the memory in a new adapter (1025).
9. Adjust the switch and jumper settings on the new adapter (see "Section 5. Jumpers and Switch Settings").



Memory Modules 1025

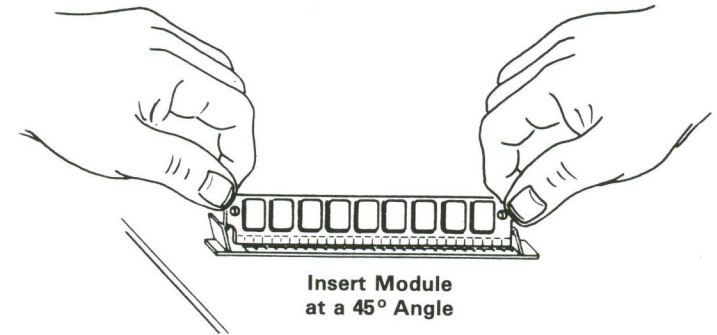
1. Power off the system.
2. Remove the system unit cover (1005).
3. Remove the 0.5 to 3MB Memory Expansion Adapter (1015).
4. Apply outward force to the retention latches of the memory socket. Equal pressure should be put on both retention latches at the same time. The board will spring forward slightly as it is released for easy removal.



Note: Follow these four steps only when removing a memory module. Follow steps 1-5 below when replacing a memory module.

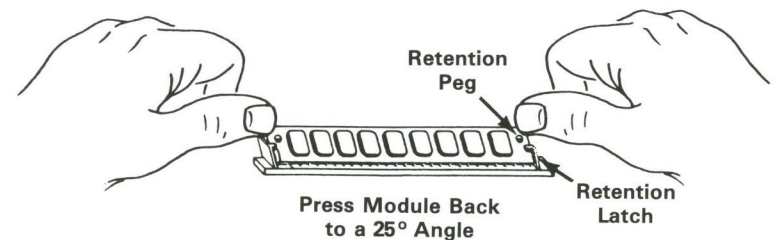
1. Position the module as shown below.

Insert the module with downward pressure until the contacts almost completely disappear. Apply even pressure firmly across the top edge of the memory module.



2. Pivot the module downward from the top until a click is heard. The module should now be latched at a 25 degree angle to the socket.

To ensure that the memory module has been properly installed, check to see that the retention pegs have snapped into the holes at each end of the module.



3. Replace the 0.5 to 3MB Memory Expansion Adapter (1015).
4. Replace the system unit cover (1005).
5. Power on the system.

Serial/Parallel Ports on the Adapter 1035

1. Power off the system.
2. Remove the system unit cover (1005).
3. Remove the 0.5 to 3MB Memory Expansion Adapter (1015).

Section 5. Jumpers and Switch Settings

Contents

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Switch Settings	5-7
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Switches 6 and 7	5-10
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Notes:

System Setup

The Setup program is on the Memory Expansion Diagnostics diskette. You need to know what options are installed in the system unit to run the Setup program.

1. Make a list of the option adapters installed in the system.
2. Determine the type of drives installed.
 - Fixed Disk Drive: A label on front of the drive.
 - Diskette Drive: The bezel of a double-sided diskette drive has an asterisk; the bezel of a high-capacity diskette drive is not marked.
3. Refer to the information in "Jumpers and Switch Settings" to ensure all jumpers and switches are set correctly.

Note: If you receive an error code, troubleshoot any error indications other than 16X first. If the only error code you receive is 16X, and you cannot correct the Setup program using the instructions on the following page, go to "MAP 0000: Start."

System Setup

1. Insert the Memory Expansion Diagnostics diskette into drive A.
2. Power on the system.
3. When the Select an Option menu appears, select option 4 (SETUP) and verify the options are correctly set.

The Setup program will prompt you for the following information:

Time	Set or change the time.
Date	Set or change the date.
Diskette Drives	Select the number and type (high capacity or double sided) installed.
Fixed Disk Drives	Select the number and type of drives installed.
Memory	Select the amount of base and expansion memory installed.
Display	Set the primary display if two display adapters are installed. Select the mode (40 or 80 column) if a color display is installed.

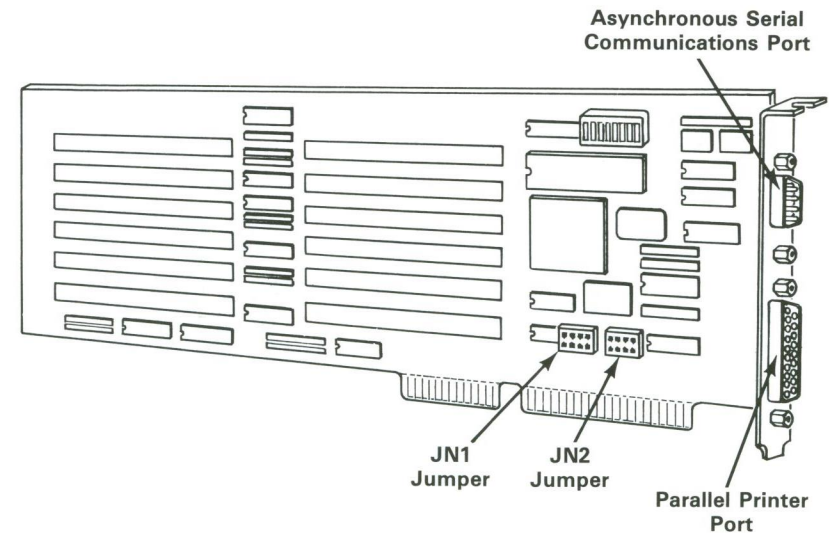
Jumpers

In the bottom right part of the adapter are two jumpers. The leftmost jumper, labeled JN1, determines the address of the asynchronous serial communications port.

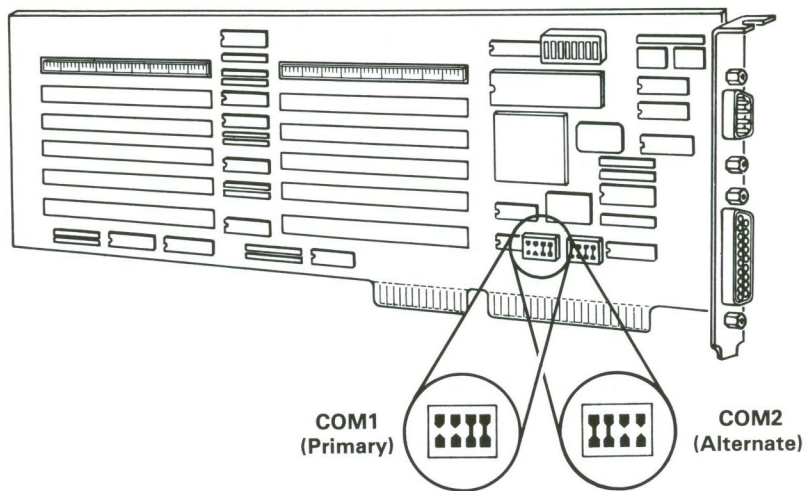
The jumper on the right, labeled JN2, determines the address of the parallel printer port.

The I/O ports themselves are attached to the bracket on the right side of the card. The asynchronous serial communications port at the top of the bracket is a 9-pin RS-232C connector. This port interfaces to a modem, a serial printer, remote display terminal, or other serial devices via a 9-to-25 pin serial adapter cable.

The parallel printer port is a 25-pin connector that is used to connect a parallel printer to the IBM Personal Computer AT.

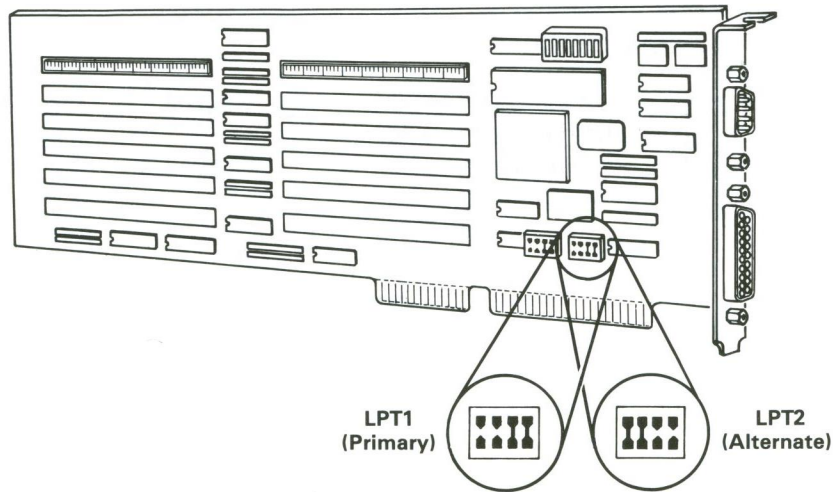


The jumper for the serial port can be configured for an address of COM1 or COM2.



The address COM1 is referred to as the "Primary Serial Port" and COM2 is referred to as the "Alternate Serial Port."

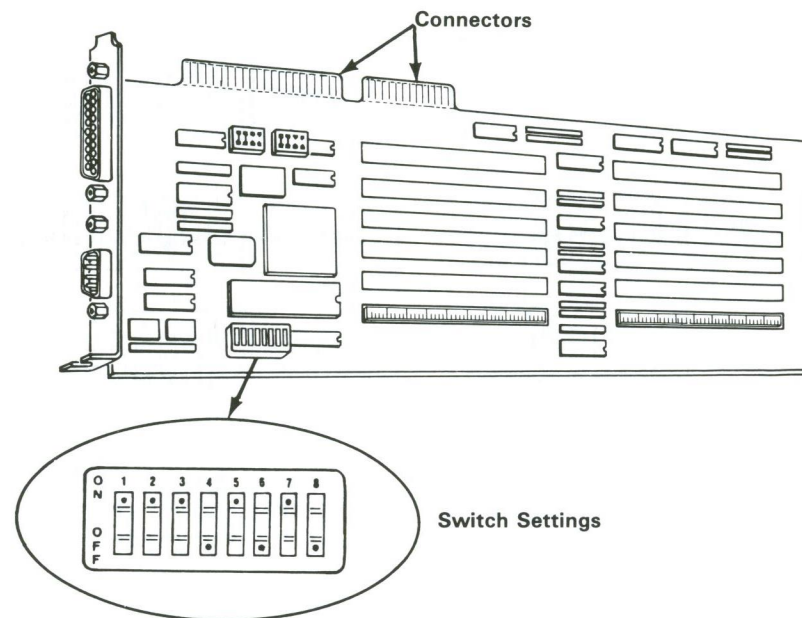
The jumper for the parallel port can be configured for an address of LPT1 or LPT2.



The address LPT1 is referred to as the "Primary Parallel Port" and LPT2 is referred to as the "Alternate Parallel Port."

Switch Settings

There are eight rocker switches located together in a block on the adapter. The switches are numbered 1 to 8. The adapter in the figure is shown with the connectors at the top. This is so the numbers above the switches can be read easily.



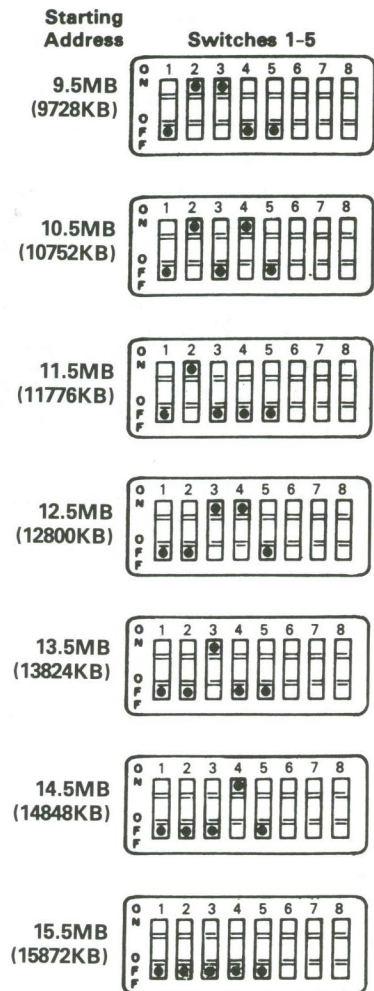
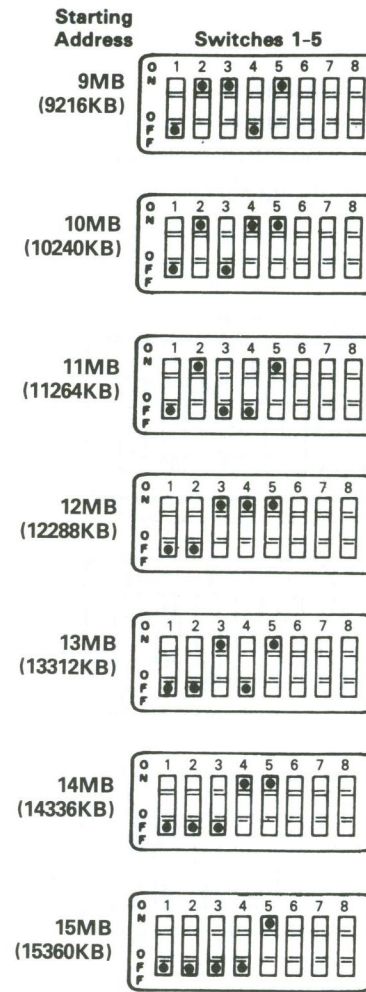
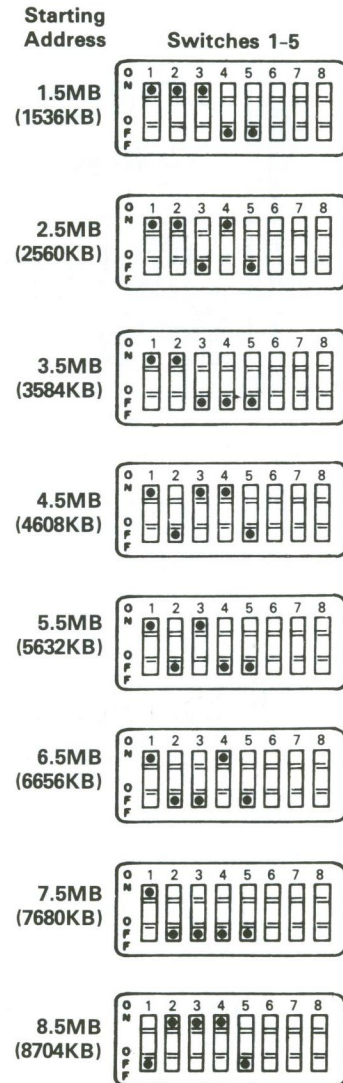
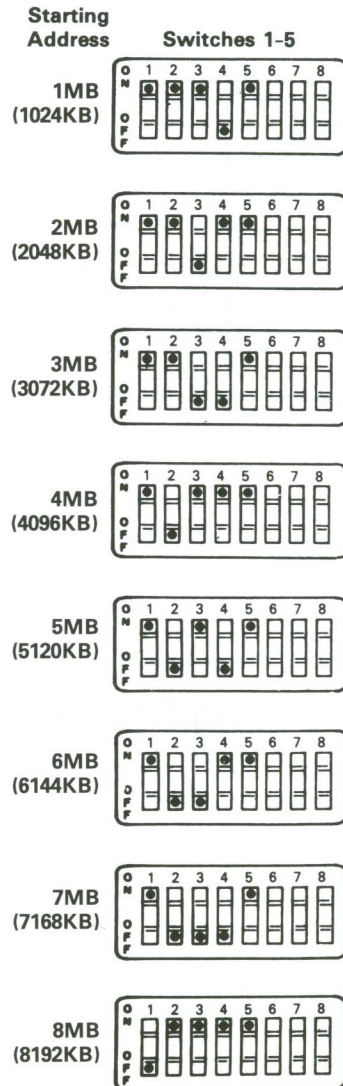
Note: The dot on a switch indicates which end of the switch is depressed.



For example, this switch is set to the ON position.

Switches 1-5

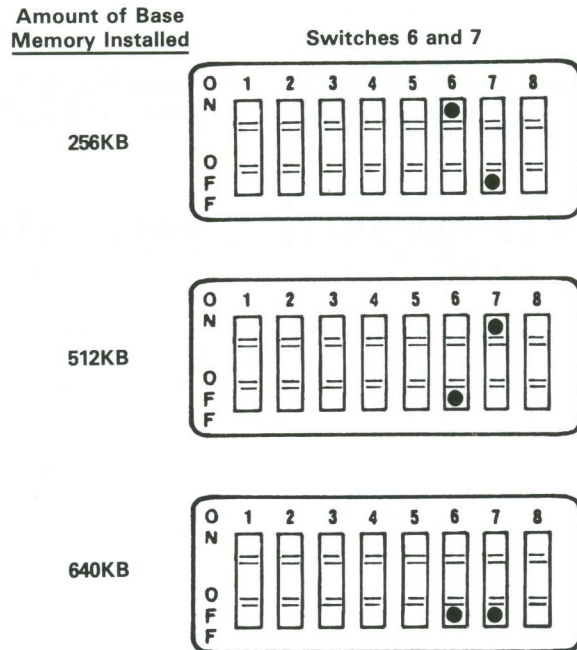
Switches 1-5 determine the starting address of memory added to the expansion memory area. Memory added to this area can have a starting address from 1MB up to 15.5MB.



Note: It is not necessary to reset the starting address on the adapter when memory modules are added to it. The starting address of memory on the adapter will stay the same. The adapter will automatically adjust for the increase in memory size.

Switches 6 and 7

Switches 6 and 7 determine the starting address of memory that is added to the base memory area. The starting address depends on the amount of base memory installed in the computer excluding the 0.5 to 3MB Memory Expansion Adapter.



Switch 8

Switch 8 enables or disables the I/O ports on the adapter. In the ON position, the switch enables the ports. In the OFF position, the switch disables the ports.

Switch Definition Summary

The following table summarizes the meaning of each of the eight switches:

Switch #	Definition
1-5	Starting Address in the Expansion Memory Area
6-7	Starting Address in the Base Memory Area
8	I/O Ports Enable/Disable

Configuring Multiple Adapters

It is possible to install up to five 0.5 to 3MB Memory Expansion Adapters in an IBM Personal Computer AT.

The switch settings on each adapter will vary depending on the number of adapters and the amount of memory currently installed in the computer.

If a computer contains 640KB of base memory, adapters are added to the expansion memory area. An adapter with the maximum 3MB of memory is configured to start at the first available address in the expansion area. Each remaining adapter is configured to start at the address following the one before it. Only one adapter can contain less than 3MB of memory. This adapter must have the highest starting address.

If a computer contains 256KB or 512KB of base memory, adapters are configured somewhat differently. One adapter with 3MB of memory is configured to start at an address of 1MB. The next adapter is configured to start at 4MB, the next one at 7MB, and so on. Each adapter in the expansion memory area must have 3MB of memory.

In this case, one adapter is used to fill the base memory area. It is configured to start at a base memory address of 256KB or 512KB, depending on the amount of base memory currently installed. This adapter can have less than 3MB of memory. It must have the highest starting address in expansion memory. Only one adapter can use split memory addressing in this way.

Switch number 8 on each adapter is used to enable or disable the I/O ports on that adapter. To enable the I/O ports, switch number 8 should be set ON. To disable the I/O ports, switch number 8 should be set OFF. Keep in mind that the IBM Personal Computer AT can have at most two serial and two parallel ports enabled.

Section 6. Parts

Contents

Limited Warranty—IBM Service Parts	6-2
0.5 to 3MB Memory Expansion Adapter	6-3
Memory Module Kit	6-4

The warranty terms and conditions applicable in the country of purchase (except for the United States and Puerto Rico) in respect of an IBM Personal Computer Product are available from the supplier.

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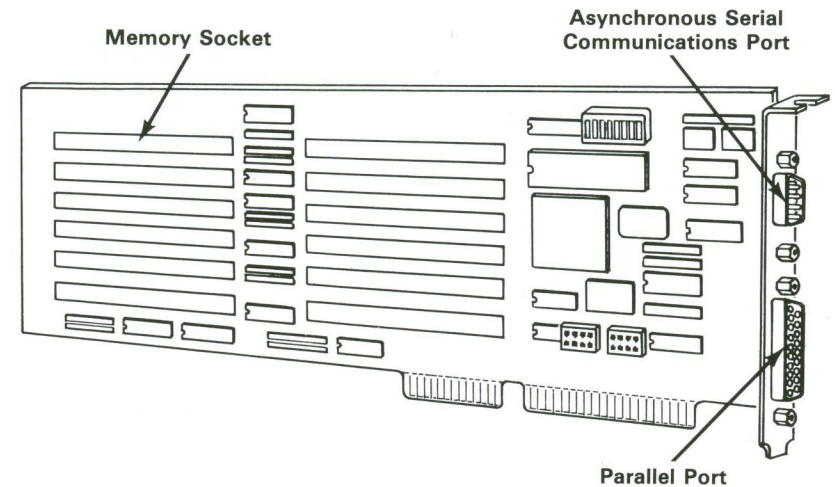
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0.5 to 3MB Memory Expansion Adapter



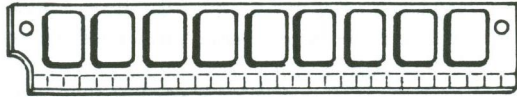
Part Number: 55X3619

Units: Maximum of 5 in an IBM Personal Computer AT

Description: Contains memory sockets for a maximum of 3MB of memory as well as serial/parallel ports.

0.5 MegaByte Memory Kit

Memory Module



Part Number: 55X3547

Units: A 0.5 MegaByte Memory Kit contains two memory modules. As many memory kits as required can be installed in an adapter.

Description: The 0.5 MegaByte Memory Kit contains the minimum amount of memory (512KB) that can be added to a 0.5 to 3MB Memory Expansion Adapter. Each memory module in a kit is a SIP module containing 256KB of memory.

Section 7. Error Codes

Notes:

Error Codes

Possible Error Codes	Definition
201	Memory Error
202	Addressing Error
203	Refresh Error
204	Memory Error below .5 to 3MB Adapter Settings below 640K Starting Address
205	Memory Error below .5 to 3MB Adapter Settings above 1MB Starting Address
210	Card #1 Memory Module #1
211	Card #1 Memory Module #2
212	Card #1 Memory Module #3
213	Card #1 Memory Module #4
214	Card #1 Memory Module #5
215	Card #1 Memory Module #6
216	Card #1 Memory Module #7
217	Card #1 Memory Module #8
218	Card #1 Memory Module #9
219	Card #1 Memory Module #10
220	Card #1 Memory Module #11
221	Card #1 Memory Module #12
222	Card #1 Parity Fail Memory Modules #1 and #2
223	Card #1 Parity Fail Memory Modules #3 and #4
224	Card #1 Parity Fail Memory Modules #5 and #6
225	Card #1 Parity Fail Memory Modules #7 and #8
226	Card #1 Parity Fail Memory Modules #9 and #10
227	Card #1 Parity Fail Memory Modules #11 and #12
228	Card #2 Memory Module #1
229	Card #2 Memory Module #2
230	Card #2 Memory Module #3
231	Card #2 Memory Module #4
232	Card #2 Memory Module #5
233	Card #2 Memory Module #6
234	Card #2 Memory Module #7
235	Card #2 Memory Module #8
236	Card #2 Memory Module #9
237	Card #2 Memory Module #10
238	Card #2 Memory Module #11

**Possible
Error
Codes**

Definition

239	Card #2 Memory Module #12
240	Card #2 Parity Fail Memory Modules #1 and #2
241	Card #2 Parity Fail Memory Modules #3 and #4
242	Card #2 Parity Fail Memory Modules #5 and #6
243	Card #2 Parity Fail Memory Modules #7 and #8
244	Card #2 Parity Fail Memory Modules #9 and #10
245	Card #2 Parity Fail Memory Modules #11 and #12
246	Card #3 Memory Module #1
247	Card #3 Memory Module #2
248	Card #3 Memory Module #3
249	Card #3 Memory Module #4
250	Card #3 Memory Module #5
251	Card #3 Memory Module #6
252	Card #3 Memory Module #7
253	Card #3 Memory Module #8
254	Card #3 Memory Module #9
255	Card #3 Memory Module #10
256	Card #3 Memory Module #11
257	Card #3 Memory Module #12
258	Card #3 Parity Fail Memory Modules #1 and #2
259	Card #3 Parity Fail Memory Modules #3 and #4
260	Card #3 Parity Fail Memory Modules #5 and #6
261	Card #3 Parity Fail Memory Modules #7 and #8
262	Card #3 Parity Fail Memory Modules #9 and #10
263	Card #3 Parity Fail Memory Modules #11 and #12
264	Card #4 Memory Module #1
265	Card #4 Memory Module #2
266	Card #4 Memory Module #3
267	Card #4 Memory Module #4
268	Card #4 Memory Module #5
269	Card #4 Memory Module #6
270	Card #4 Memory Module #7
271	Card #4 Memory Module #8
272	Card #4 Memory Module #9
273	Card #4 Memory Module #10
274	Card #4 Memory Module #11
275	Card #4 Memory Module #12

**Possible
Error
Codes**

Definition

276	Card #4 Parity Fail Memory Modules #1 and #2
277	Card #4 Parity Fail Memory Modules #3 and #4
278	Card #4 Parity Fail Memory Modules #5 and #6
279	Card #4 Parity Fail Memory Modules #7 and #8
280	Card #4 Parity Fail Memory Modules #9 and #10
281	Card #4 Parity Fail Memory Modules #11 and #12
282	Card #5 Memory Module #1
283	Card #5 Memory Module #2
284	Card #5 Memory Module #3
285	Card #5 Memory Module #4
286	Card #5 Memory Module #5
287	Card #5 Memory Module #6
288	Card #5 Memory Module #7
289	Card #5 Memory Module #8
290	Card #5 Memory Module #9
291	Card #5 Memory Module #10
292	Card #5 Memory Module #11
293	Card #5 Memory Module #12
294	Card #5 Parity Fail Memory Modules #1 and #2
295	Card #5 Parity Fail Memory Modules #3 and #4
296	Card #5 Parity Fail Memory Modules #5 and #6
297	Card #5 Parity Fail Memory Modules #7 and #8
298	Card #5 Parity Fail Memory Modules #9 and #10
299	Card #5 Parity Fail Memory Modules #11 and #12

Notes:

Glossary

diagnostic: Pertaining to the detection and isolation of a malfunction or mistake.

error log: In the Setup program, a data set used to record information about certain hardware events.

fixed disk: A disk made of rigid material with a magnetic coating, used for mass storage and retrieval of data.

formatting: The preparation of a fixed disk or diskette for use by the computer.

FRU: Field replaceable unit.

MAP: Maintenance analysis procedure.

menu: A display of a list of available machine functions for selection by the operator.

modem: A device that allows information to be exchanged between computers by using telephone lines.

module: A packaged functional hardware unit designed for use with other components.

operating system: A program that supervises the computer's use of programs.

parallel transmission: In data communications, the simultaneous transmission of the bits constituting an entity of data over a data circuit.

parity check: A redundancy check that uses a parity bit.

port: An access point for data entry or exit.

POST: Power-On Self Test—A series of diagnostic tests that are run each time the computer's power is turned on.

serial transmission: The sequential transmission of the bits constituting an entity of data over a data circuit.



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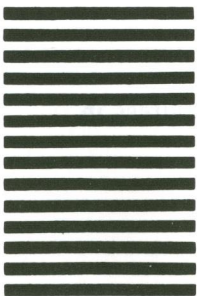
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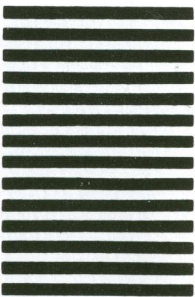
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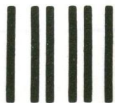
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