

**10.** Did the following appear on your screen?

The IBM Personal Computer **DIAGNOSTICS**  
Version XXX (C) Copyright IBM Corp XXXX  
**SELECT AN OPTION**  
0 - RUN DIAGNOSTIC ROUTINES  
1 - FORMAT DISKETTE  
2 - COPY DISKETTE  
3 - PREPARE FIXED DISK FOR RELOCATION  
9 - EXIT TO SYSTEM DISKETTE  
**ENTER THE ACTION DESIRED**

**YES** - Go to Step 11.

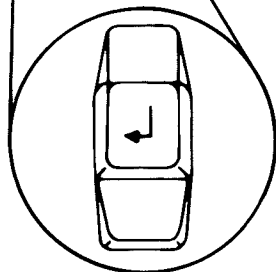
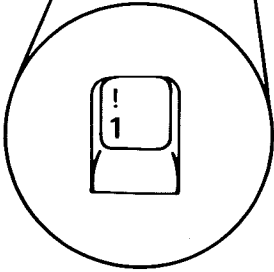
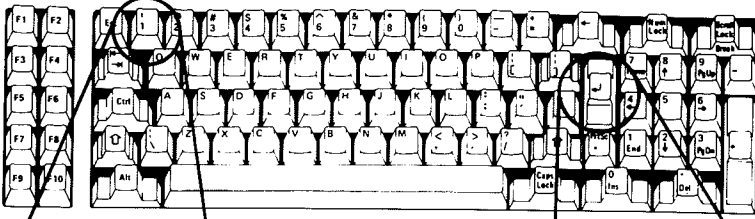
**NO** - Remove the diskette and verify that it:

- Was the Diagnostics diskette.
- Was inserted correctly.

Correct any mistakes. If the Diagnostics diskette was inserted correctly, the system unit is probably at fault.

**Note:** If you are using your home television or non-IBM display, you could experience data errors while using your diskette drive. This interference is easily corrected by moving your television or display 12 inches away from your IBM Personal Computer.

11. Press  to select **FORMAT DISKETTE** then



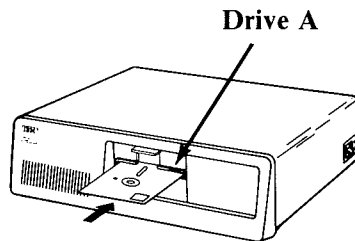
**12.** Did the following appear on your screen?



The IBM Personal Computer DIAGNOSTICS  
Version XXX (C) Copyright IBM Corp XXXX  
SELECT AN OPTION  
0 - RUN DIAGNOSTIC ROUTINES  
1 - FORMAT DISKETTE  
2 - COPY DISKETTE  
3 - PREPARE FIXED DISK FOR RELOCATION  
9 - EXIT TO SYSTEM DISKETTE  
ENTER THE ACTION DESIRED  
? 1  
WHICH DRIVE CONTAINS DISKETTE  
TO BE FORMATTED?

**YES** - Go to Step 13.

**NO** - Have your keyboard serviced.

**13.** Remove the Diagnostics diskette from drive A and insert a blank diskette.



**14.** Press  then  .

The blank diskette will be formatted, and the in-use light will be on during formatting.

When the in-use light goes out, remove the formatted (scratch) diskette.

**Note:** A formatted diskette that has no data stored on it is called a *scratch* diskette.

**15.** Reinsert the Diagnostics diskette into drive A.

Did the following appear on your screen?

**SELECT AN OPTION**

**0 - RUN DIAGNOSTIC ROUTINES**



**1 - FORMAT DISKETTE**

**2 - COPY DISKETTE**

**3 - PREPARE FIXED DISK FOR RELOCATION**

**9 - EXIT TO SYSTEM DISKETTE**

**ENTER THE ACTION DESIRED**

**YES** - Press  then .

If you have one display option installed in your system go to Step 17. If you have an IBM Monochrome Display and Printer Adapter and a Color/Graphics Monitor Adapter installed in your system, go to Step 16.


**NO** - Remove the diskette and verify the following:

- It was a blank diskette.
- The diskettes were inserted in the correct order (blank diskette then Diagnostics diskette).

Try another blank diskette. If the problem still exists, have the system unit serviced.



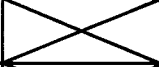
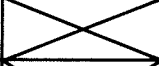


**16.** Do you have a display attached to each display adapter installed in your system?

**IS A MONITOR ATTACHED TO EVERY DISPLAY ADAPTER (Y/N)?**

**YES** - Press  then  and go to Step 17.

**NO** - Press  then  and go to Step 17.

- 17.** Complete the list of installed devices and options and indicate their location with a check mark. Enter the amount of memory installed in your system.

System Unit	Expansion Unit	Installed Device/Option
		System Board
		Expansion Option
		XXX K of Memory
		Keyboard
		Monochrome and Printer Adapter
		X Diskette Drive(s) and Adapter
		Printer Adapter
		Async Communications Adapter
		Matrix Printer
		X Fixed Disk Drive(s) and Adapter
		Game Control Adapter
		Color/Graphics Monitor Adapter
		SDLC Adapter

**Installed Devices, Options, and Memory**

**Note:** The IBM Communications Adapter Cable and Printer Adapter Cable will not appear on the list.



In the following sample "S" means the device is installed in the system unit, and "E" means the expansion unit.

- 18.** Does your screen correctly list all your installed devices and options.

**THE INSTALLED DEVICES ARE**

S SYSTEM BOARD  
S EXPANSION OPTION  
S 256KB MEMORY  
S KEYBOARD  
S MONOCHROME & PRINTER ADAPTER  
S COLOR/GRAPHICS MONITOR ADAPTER  
S 2 DISKETTE DRIVE(S) AND ADAPTER  
S GAME CONTROL ADAPTER  
E 1 FIXED DISK DRIVE(S) & ADAPTER  
S MATRIX PRINTER

IS THE LIST CORRECT (Y/N) ?

**YES** - Press  then  and go to Step 19.

**NO** - If the matrix printer was not listed, go to "Printer Problem Determination Procedures." For all other devices or options incorrectly listed, if the option is installed in the system unit, have the system unit serviced. If the option is installed in the expansion unit, have the expansion unit serviced.

**19.** Press  to select **RUN TESTS ONE TIME**, then



**SYSTEM CHECKOUT**

**0 - RUN TESTS ONE TIME**

**1 - RUN TESTS MULTIPLE TIMES**

**2 - LOG UTILITIES**

**9 - EXIT DIAGNOSTIC ROUTINES**

**ENTER THE ACTION DESIRED**

**?**

Is an expansion unit attached?

**YES** - Go to Step 20.

**NO** - Go to Step 27.

**20.** Did you receive an expansion unit error message (18XX)?

**SYSTEM CHECKOUT**

- 0 - RUN TESTS ONE TIME**
- 1 - RUN TEST MULTIPLE TIMES**
- 2 - LOG UTILITIES**
- 9 - EXIT DIAGNOSTIC ROUTINES**

**ENTER THE ACTION DESIRED**

**? 0**

**SYSTEM UNIT        100**

**EXPANSION UNIT    1800**

**THIS TEST TAKES UP TO TWO MINUTES**

**PLEASE STAND BY**

**YES - Go to Step 21.**

**NO - Go to Step 27.**

**21.** Did you receive an 1819 error message (see the following)?

SYSTEM UNIT      100  
XX:XX:XX  
ERROR EXPANSION UNIT      1819  
PRESS ENTER TO CONTINUE

**YES** - Have the expansion unit serviced.

**NO** - Go to Step 22.

**22.** Did you receive an 1820 or 1821 error message?

**SYSTEM UNIT      100**

**XX:XX:XX**

**ERROR EXPANSION UNIT      182X**

**PRESS ENTER TO CONTINUE**

**?**

**YES** - Have the expansion unit and expansion unit cable serviced.

- NO** - a. Set the Power switches on the system unit and expansion unit to Off.  
b. Set all external power switches Off (printer, TV, etc.).  
c. Disconnect the expansion unit cable from the system unit.  
d. Set the system unit's Power switch to On.  
e. Go to Step 23.

**23.** Press  to select **RUN DIAGNOSTIC ROUTINES**,

then  .

**THE IBM PERSONAL COMPUTER DIAGNOSTICS  
VERSION XXX (C) COPYRIGHT IBM CORP XXXX**

**SELECT AN OPTION**

**0 - RUN DIAGNOSTIC ROUTINES**

**1 - FORMAT DISKETTE**

**2 - COPY DISKETTE**

**3 - PREPARE FIXED DISK FOR RELOCATION**



**9 - EXIT TO SYSTEM DISKETTE**



**ENTER THE ACTION DESIRED**

If you have one display option installed in your system, go to Step 25. If you have an IBM Monochrome Display and Printer Adapter and a Color/Graphics Monitor Adapter installed in your system, go to Step 24.

**24.** Do you have a display attached to each display adapter installed in your system?

IS A MONITOR ATTACHED TO EVERY DISPLAY ADAPTER (Y/N)?

**YES** - Press  then  and go to Step 25.



**NO** - Press  then  and go to Step 25.

**25.** Are any of the options or devices installed in your expansion unit missing from the list?

**THE INSTALLED DEVICES ARE**

- S SYSTEM BOARD
- S EXPANSION OPTION
- S 256KB MEMORY
- S KEYBOARD
- S MONOCHROME & PRINTER ADAPTER
- S COLOR/GRAPHICS MONITOR ADAPTER
- S 2 DISKETTE DRIVE(S) AND ADAPTER
- S GAME CONTROL ADAPTER
- E 1 FIXED DISK DRIVE(S) & ADAPTER
- S MATRIX PRINTER

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

**YES** - Press  then  and go to Step 26.

**NO** - Have the system unit serviced.

**26.** Press  to select **RUN TESTS ONE TIME** then



**SYSTEM CHECKOUT**

**0 - RUN TESTS ONE TIME**

**1 - RUN TESTS MULTIPLE TIMES**

**2 - LOG UTILITIES**

**9 - EXIT DIAGNOSTIC ROUTINES**

**ENTER THE ACTION DESIRED**

**?**

Did you get an 1820 error message?

**YES** - Have the expansion unit and expansion unit cable serviced.

**NO** - Have the system unit serviced.

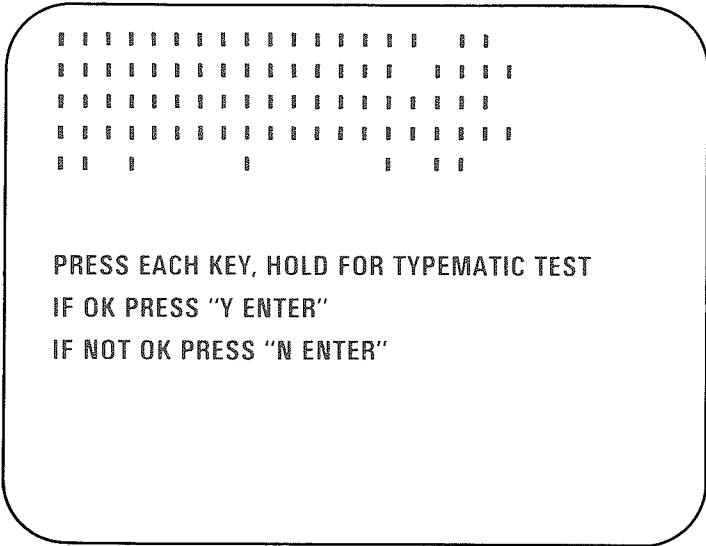
**27.** Did the following appear on your screen?

**SYSTEM UNIT    100**  
**THIS TEST TAKES UP TO TWO MINUTES**  
**PLEASE STAND BY**



**YES** - Go to Step 28.

**NO** - Have the system unit serviced.

**28.** Did the following appear on your screen?



**YES** - Press each key once, then go to Step 29.

**NO** - Press  then  . Record the error message. Have the system unit serviced.



**29.** Did the following appear on your screen?



```
1 2 < 1 2 3 4 5 6 7 8 9 0 - = <=> N S
3 4 L Q W E R T Y U I O P [ ] 7 8 9
5 6 C A S D F G H J K L ; ' ' R 4 5 6
7 8 S \ Z X C V B N M , . / S * 1 2 3 +
9 0 A S C 0 .
```

**PRESS EACH KEY HOLD FOR TYPEMATIC TEST  
IF OK PRESS "Y ENTER"  
IF NOT OK PRESS "N ENTER"**

**YES** - Press and hold any key. The corresponding character on the screen will flash. This is the typematic test.

If the typematic test works correctly, press

 then  and go to Step 30. If the

typematic test failed, press  then .

Record the error message. Have the keyboard serviced.

**NO** - If any block did not change to a character, have the keyboard serviced.

**30.** Do you have an IBM Monochrome Display attached to your system?

**NO** - Go to Step 33.

**YES** - Did the following appear on your screen?

**DISPLAY ATTRIBUTES**

**THIS LINE IS AT NORMAL INTENSITY.**

**THIS LINE IS INTENSIFIED.**

**THIS LINE IS IN REVERSE VIDEO.**

**THIS LINE IS BLINKING**

**THIS LINE IS UNDERLINED**

**IS THE SCREEN CORRECT? (Y/N)**

**YES** - Press  then  and go to Step 31.

**NO** - Press  then  . Record the error message.

If the following error message appears, the system unit is at fault. Have the system unit serviced.

**XX:XX:XX**

**ERROR - SYSTEM UNIT      XXXX**

(X can be any character)

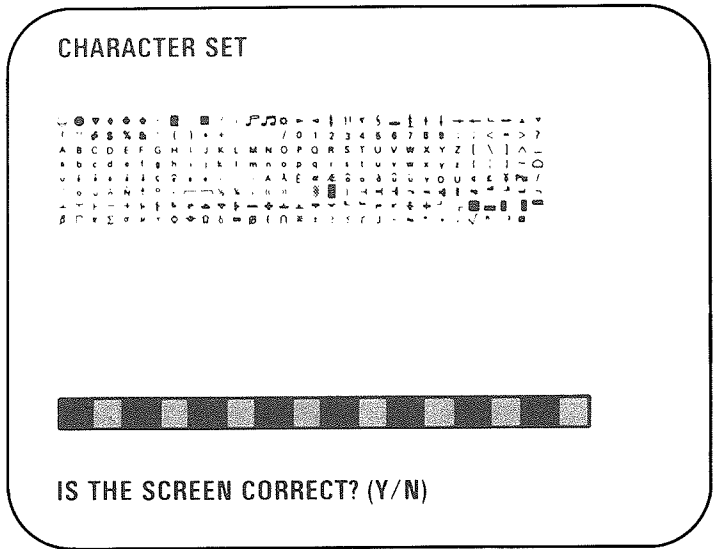
If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.

**XX:XX:XX**

**ERROR - EXPANSION UNIT      XXXX**

(X can be any character)

### 31. Did the following appear on your screen?



**YES** - Press  then  and go to Step 32.

**NO** - Press  then  . Record the error message.

If the following error message appears, the system unit is at fault. Have the system unit serviced.

XX:XX:XX  
**ERROR - SYSTEM UNIT XXXX**  
(X can be any character)

If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.

XX:XX:XX  
**ERROR - EXPANSION UNIT XXXX**  
(X can be any character)

## 32. Did the following appear on your screen?

NO - Press  then  and go to Step 43.



YES - Press  then  and go to Step 33.

NO - Press  then  . Record the error message.

**IS THE SCREEN CORRECT ? (Y/N)**

**YES -** Do you have a Color/Graphics Monitor Adapter installed in your system with a display attached to it?

**NO -** Press  then  and go to Step 43.

**YES -** Press  then  and go to Step 33.

**NO -** Press  then  . Record the error message.

If the error message is 432, go to "Printer Problem Determination Procedures."

If the following error message appears, the system unit is at fault. Have the system unit serviced.

**XX:XX:XX**

**ERROR - SYSTEM UNIT      XXXX**

(X can be any character)

If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.

**XX:XX:XX**

**ERROR - EXPANSION UNIT      XXXX**

(X can be any character)

### 33. Did the following appear on your color display?

#### DISPLAY ATTRIBUTES

THIS LINE IS AT NORMAL INTENSITY.


THIS LINE IS INTENSIFIED.

THIS LINE IS IN REVERSE VIDEO.

THIS LINE IS BLINKING.

 BLUE


 GREEN

 CYAN

 RED

 MAGENTA

YELLOW

 WHITE

IS THE SCREEN CORRECT ? (Y/N)

**YES** - Press  then  and go to Step 34.

**NO** - Press  then  . Record the error message.

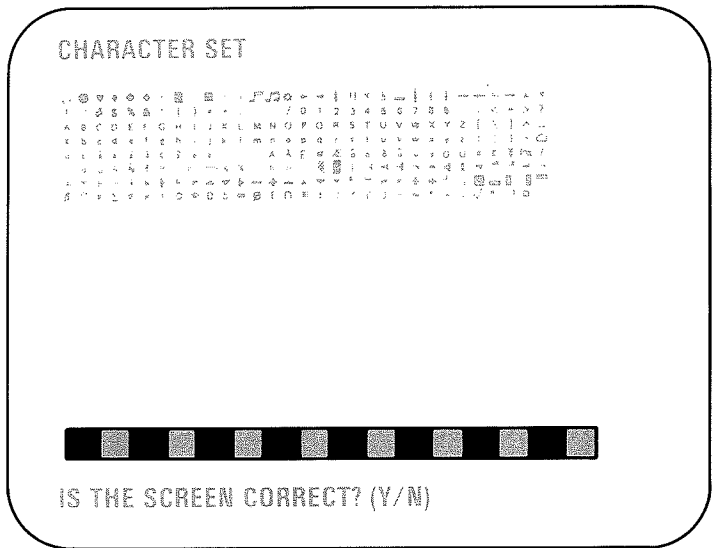
If the following error message appears, the system unit is at fault. Have the system unit serviced.





XX:XX:XX  
ERROR - SYSTEM UNIT      XXXX  
(X can be any character)

If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.

XX:XX:XX  
ERROR - EXPANSION UNIT      XXXX  
(X can be any character)

**34.** Did the following appear on your screen?



- YES** - Press  then  and go to Step 35.
- NO** - Press  then . Record the error message.

If the following error message appears, the system unit is at fault. Have the system unit serviced.

XX:XX:XX  
ERROR - SYSTEM UNIT      XXXX  
(X can be any character)

If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.

XX:XX:XX  
ERROR - EXPANSION UNIT      XXXX  
(X can be any character)







### 36. Did the following appear on your screen?

#### 40X25 DISPLAY

```
) * + , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ A B C D E F G H I J K L M N O  
* + , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ A B C D E F G H I J K L M N O P  
+ , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ A B C D E F G H I J K L M N O P Q  
, - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ A B C D E F G H I J K L M N O P Q R  
- . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ A B C D E F G H I J K L M N O P Q R S  
./ 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ A B C D E F G H I J K L M N O P Q R S T  
/ 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ A B C D E F G H I J K L M N O P Q R S T U  
0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ A B C D E F G H I J K L M N O P Q R S T U V  
1 2 3 4 5 6 7 8 9 : ; < = > ? @ A B C D E F G H I J K L M N O P Q R S T U V W
```

IS THE SCREEN CORRECT? (Y/N)

**YES** - Press  then  and go to Step 37.

**NO** - Press  then  . Record the error message.

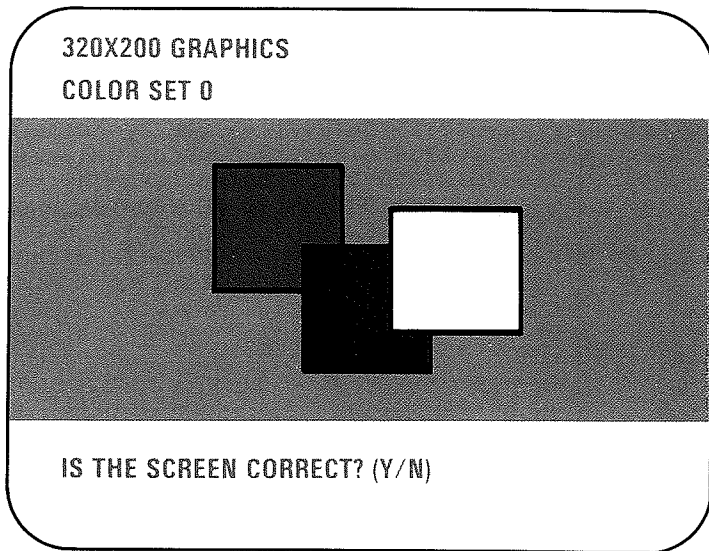
If the following error message appears, the system unit is at fault. Have the system unit serviced.

```
XX:XX:XX  
ERROR - SYSTEM UNIT      XXXX  
(X can be any character)
```

If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.

```
XX:XX:XX  
ERROR - EXPANSION UNIT      XXXX  
(X can be any character)
```

**37.** Did the following appear on your screen?



**YES** - Press  then  and go to Step 38.

**NO** - Press  then  . Record the error message.

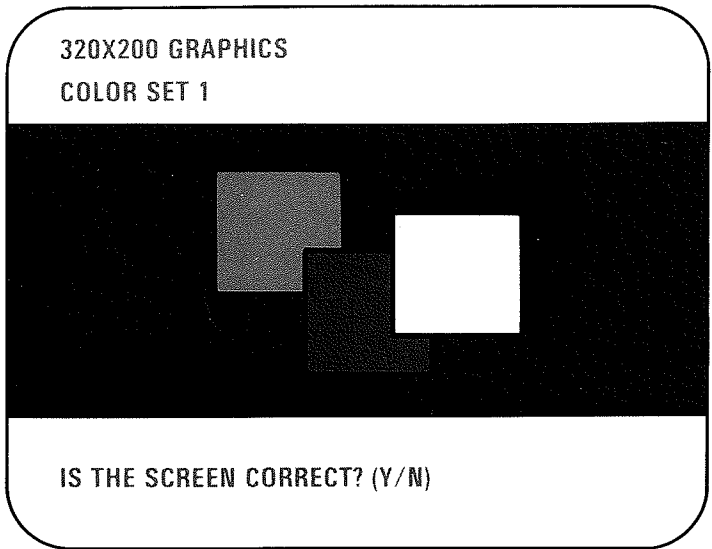
If the following error message appears, the system unit is at fault. Have the system unit serviced.





XX:XX:XX  
ERROR - SYSTEM UNIT      XXXX  
(X can be any character)

If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.

XX:XX:XX  
ERROR - EXPANSION UNIT      XXXX  
(X can be any character)

**38.** Did the following appear on your screen?



- YES** - Press  then  and go to Step 39.
- NO** - Press  then  . Record the error message.

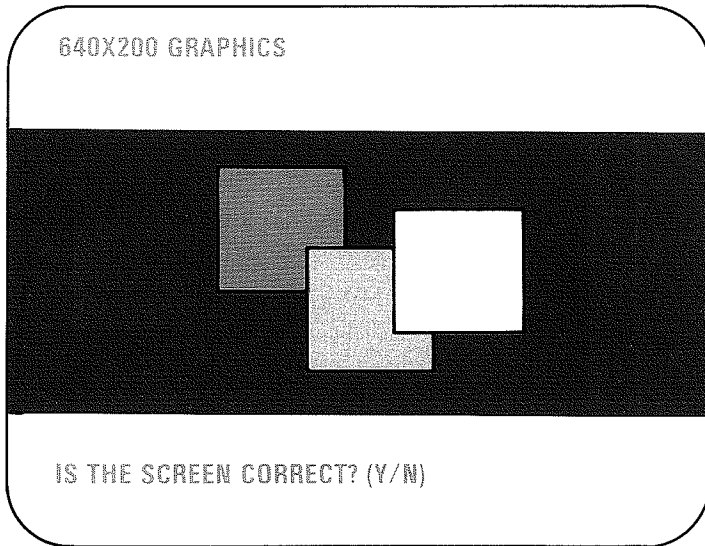
If the following error message appears, the system unit is at fault. Have the system unit serviced.

XX:XX:XX  
ERROR - SYSTEM UNIT      XXXX  
(X can be any character)



If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.

XX:XX:XX  
ERROR - EXPANSION UNIT      XXXX  
(X can be any character)

**39.** Did the following appear on your screen?



**YES** - Press  then  and go to Step 40.

**NO** - Press  then  . Record the error message.

If the following error message appears, the system unit is at fault. Have the system unit serviced.

XX:XX:XX  
ERROR - SYSTEM UNIT      XXXX  
(X can be any character)

If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.

XX:XX:XX  
ERROR - EXPANSION UNIT      XXXX  
(X can be any character)



**41.** Press any key, video page 1 will be displayed.  
Continue to press any key until video page 0 is displayed.

**42.** Were all 8 pages displayed?

**VIDEO PAGE 0**

oo  
oo  
oo  
oo  
oo  
oo  
oo  
oo  
oo  
oo  
oo  
oo  
oo  
oo  
oo  
oo  
oo  
oo  
oo  
oo  
oo  
oo

**WERE ALL 8 PAGES DISPLAYED?**

**YES** - Press  then  and go to Step 43.

**NO** - Press  then  . Record the error message.

If the following error message appears, the system unit is at fault. Have the system unit serviced.

XX:XX:XX  
**ERROR - SYSTEM UNIT      XXXX**  
(X can be any character)

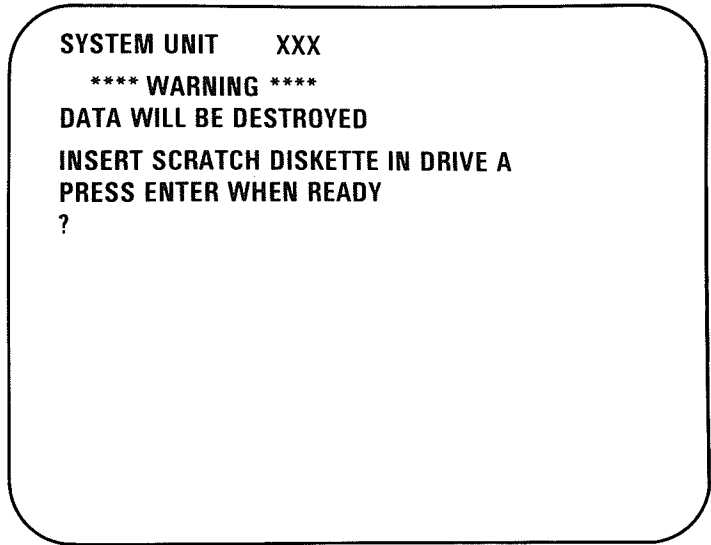
If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.

XX:XX:XX  
**ERROR - EXPANSION UNIT      XXXX**  
(X can be any character)

**43.** Remove the Diagnostics diskette.

Your screen will match the figure below.

XXX will be either 400 or 500.



**YES** - Go to Step 44.

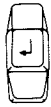
**NO** - Record the error message.

If the following error message appears, the system unit is at fault. Have the system unit serviced.

```
XX:XX:XX
ERROR - SYSTEM UNIT   XXXX
(X can be any character)
```

If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.


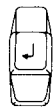
```
XX:XX:XX
ERROR - EXPANSION UNIT   XXXX
(X can be any character)
```

- 44.** Insert a scratch diskette in drive A and press  .  
Did the following appear on your screen?

**DISKETTE A IS A XXX K DRIVE  
IS THE DRIVE SIZE CORRECT Y/N ?**

If your diskette drive is a 160K drive, XXX will be 160.

If your diskette drive is a 320K drive, XXX will be 320.

**YES** - Press  then  . If you don't have two diskette drives installed in your system, go to Step 47.

**NO** - Have the system unit serviced.

**45.** Did the following appear on your screen?

**\*\*\* WARNING \*\*\*  
DATA WILL BE DESTROYED  
INSERT SCRATCH DISKETTE IN DRIVE B  
PRESS ENTER WHEN READY  
?**

Remove the scratch diskette from drive A, place it in  
drive B, and press



**46.** Did the following appear on your screen?

**DISKETTE B IS A XXX K DRIVE  
IS THE DRIVE SIZE CORRECT Y/N ?**

If your diskette drive is a 160K drive, XXX will be 160.

If your diskette drive is a 320K drive, XXX will be 320.

**YES** - Press  then  and go to Step 47.

**NO** - Have the system unit serviced.

**47.** Did any of the following errors appear on your screen (X can be any character).

**XX:XX:XX**  
**ERROR - SYSTEM UNIT      9XX**

**XX:XX:XX**  
**ERROR - SYSTEM UNIT      11XX**

**XX:XX:XX**  
**ERROR - SYSTEM UNIT      12XX**

**NO** - Go to Step 48.

**YES** - Record the error message.

If the following error message appears, the system unit is at fault. Have the system unit serviced.

**XX:XX:XX**  
**ERROR - SYSTEM UNIT      XXXX**  
(X can be any character)

If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.

**XX:XX:XX**  
**ERROR - EXPANSION UNIT      XXXX**  
(X can be any character)

**48.** Did the following appear on your screen?



**DO YOU HAVE JOY STICKS, PADDLES,  
OR NOTHING ATTACHED (J P N)?**

**YES** - For joy sticks press  and go to Step 49.

For paddles press  and go to Step 52.

For nothing press  and go to Step 56.

**NO** - Go to Step 56.

49. Press  then .

50. Correct operation of your joy sticks is checked in the following manner:
- Press each button and watch the word **RELEASED** change to **PRESSED**.
  - Move each joy stick and watch the character, A or B, move inside the box.

51. Did all buttons and joy sticks operate correctly?

**HOW MANY BUTTONS DO YOU HAVE (2/4)? 2**

**BUTTON A**

**BUTTON B**

**RELEASED**

**RELEASED**

\*\*\*\*\*

\*\*\*\*\*

\*                    \*

\*                    \*

\*                    \*

\*                    \*

\*    **A**            \*

\*    **B**            \*

\*                    \*

\*                    \*

\*                    \*

\*                    \*


\*\*\*\*\*


\*\*\*\*\*

**PRESS AND RELEASE ALL BUTTONS,  
EXERCISE ALL JOY STICKS/PADDLES  
AND PRESS ANY KEY WHEN DONE**

**YES** - Press any key and go to Step 56.

**NO** - If the game control adapter is installed in the system unit, have the joy sticks and the system unit serviced. If the game control adapter is installed in the expansion unit, have the joy sticks and the expansion unit serviced.

**52.** Enter the number of paddles attached to your game control adapter (2/4) and press .

**53.** Enter the same number for the number of buttons and press .

**54.** Correct operation of your paddles is checked in the following manner:

- Press each button and watch the word **RELEASED** change to **PRESSED**.
- Turn each paddle control and watch the character, A, B, C, or D move inside the box.

**55.** Did all buttons and paddle controls operate correctly?

**HOW MANY BUTTONS DO YOU HAVE (2/4)?**

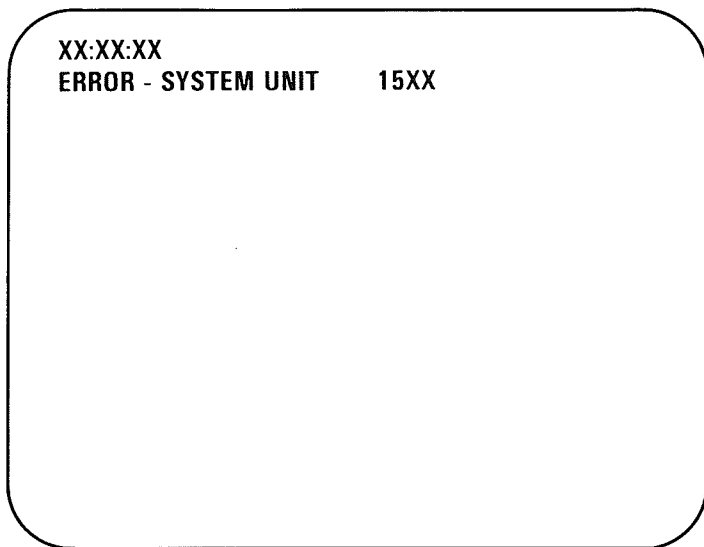
<b>BUTTON A</b>	<b>BUTTON B</b>	<b>BUTTON C</b>	<b>BUTTON D</b>
<b>RELEASED</b>	<b>RELEASED</b>	<b>RELEASED</b>	<b>RELEASED</b>
*****		*****	
* A *		* B *	
*****		*****	
*****		*****	
* C *		* D *	
*****		*****	

**PRESS AND RELEASE ALL BUTTONS,  
EXERCISE ALL JOY STICKS/PADDLES  
AND PRESS ANY KEY WHEN DONE**

**YES** - Press any key and go to Step 56.

**NO** - If the game control adapter is installed in the system unit, have the paddles and the system unit serviced. If the game control adapter is installed in the expansion unit, have the paddles and the expansion unit serviced.

**56.** Did an error appear on your screen?



**NO** - Go to Step 57.

**YES** - Record the error message.

If the following error message appears, the system unit is at fault. Have the system unit serviced.

**XX:XX:XX**  
**ERROR - SYSTEM UNIT XXXX**  
(X can be any character)

If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.

**XX:XX:XX**  
**ERROR - EXPANSION UNIT XXXX**  
(X can be any character)

**57.** Do you have a fixed disk drive installed in your system?

**NO** - Go to Step 61.

**YES** - The following will appear on your screen.

**\*\*\* WARNING \*\*\***  
**DATA ON CYLINDER 305 WILL BE**  
**OVERWRITTEN BY FIXED DISK WRITE TESTS**  
**DO YOU WANT TO INCLUDE FIXED DISK**  
**WRITE TESTS ON DRIVE C: (Y/N) ?**

Press  then  and go to Step 58.

**58.** Did the following appear on your screen?

```
*** WARNING ***
DATA ON CYLINDER 305 WILL BE
OVERWRITTEN BY FIXED DISK WRITE TESTS
DO YOU WANT TO INCLUDE FIXED DISK
WRITE TESTS ON DRIVE C: (Y/N) ? y
PERFORMING SEEK TEST
PERFORMING WRITE TEST
PERFORMING TRACK ZERO TEST
PERFORMING SURFACE SCAN
PLEASE STAND BY
```

**YES** - For one fixed disk drive installed in your system, go to Step 61. If you have a second fixed disk drive installed in your system, go to Step 59.

**NO** - Record the error message.

If the following error message appears, the system unit is at fault. Have the system unit serviced.

```
XX:XX:XX
ERROR - SYSTEM UNIT      XXXX
(X can be any character)
```

If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.

```
XX:XX:XX
ERROR - EXPANSION UNIT   XXXX
(X can be any character)
```

**59.** Did the following appear on your screen?

**\*\*\* WARNING \*\*\*  
DATA ON CYLINDER 305 WILL BE  
OVERWRITTEN BY FIXED DISK WRITE TESTS  
DO YOU WANT TO INCLUDE FIXED DISK  
WRITE TESTS ON DRIVE D: (Y/N) ?**

**YES** - Press  then  and go to Step 60.

**NO** - Record the error message.

If the following error message appears, the system unit is at fault. Have the system unit serviced.

**XX:XX:XX**

**ERROR - SYSTEM UNIT      XXXX**

(X can be any character)

If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.

**XX:XX:XX**

**ERROR - EXPANSION UNIT      XXXX**

(X can be any character)

**60.** Did the following appear on your screen?

**DO YOU WANT TO INCLUDE FIXED DISK  
WRITE TESTS ON DRIVE D: (Y/N) ? y  
PERFORMING SEEK TEST  
PERFORMING WRITE TEST  
PERFORMING TRACK ZERO TEST  
PERFORMING SURFACE SCAN  
PLEASE STAND BY**

**YES** - Go to Step 61.

**NO** - Record the error message.

If the following error message appears, the system unit is at fault. Have the system unit serviced.

**XX:XX:XX  
ERROR - SYSTEM UNIT      XXXX**  
(X can be any character)

If the following error message appears, the expansion unit is at fault. Have the expansion unit serviced.

**XX:XX:XX  
ERROR - EXPANSION UNIT      XXXX**  
(X can be any character)



**62.** Did the printer test run error free and the printer test pattern print correctly?

**YES** - Go to Step 63.

**NO** - Record any error message. Go to "Printer Problem Determination Procedures."

**63.** You have completed the Problem Determination Procedures with no failures. Remove the Diagnostics diskette and return it to the back of this manual. Your IBM Personal Computer should be ready to load your operating system.

If you should encounter further problems, contact your place of purchase for additional information.

# IBM Printer Problem Determination Procedures

Before you proceed, follow these preliminary steps:

- 1.** Check your wall outlet for proper operation (use a working lamp).
- 2.** Verify that your printer cable is properly connected.
- 3.** Verify that the printer is plugged into the wall outlet and is turned on.

Did you find any problem while following the above steps?

**YES** - Correct the problem and run the Diagnostics again.

**NO** - Go to Step 4.

- 4.** Set the Power switches on the printer, system unit (and expansion unit, if attached) to Off.
- 5.** Disconnect the printer cable from the printer.
- 6.** Run the printer self-test.

If you need help in doing this, refer to Section 3, "Operations," for the procedure.

Did the self-test run without failures?

**YES** - Go to Step 12.

**NO** - Go to Step 7.

- 7.** Check that your ribbon is installed properly.
- 8.** Check that your forms are inserted properly.
- 9.** Check that there are no obstructions in the forms path.
- 10.** Check that the tractors are adjusted properly.

If you need help with any of the above, refer to Section 3, "Operations."

Did you find any problem while following the above steps?

**YES** - Correct the problem.

**NO** - Go to Step 11.

- 11.** Do you have any of these problems?
  - a. Your printer beeps even though the paper is installed properly.
  - b. Your printer does not beep when it is out of paper.
  - c. Some of the lights on the control panel do not work.
  - d. Your printer continues to print when it is out of paper.

**YES** - Have your printer serviced.

**NO** - Go to Step 15.

**12.** Did you receive any of the following error messages?

199

432

901

1401

**YES** - Go to Step 13.

**NO** - Go to Step 15.

**13.** Leave the printer cable disconnected from the printer and run the Diagnostics again.

**Note:** "Matrix Printer" will be missing from the menu of installed devices when you run Diagnostics this time. Verify your installed devices correctly (without the printer).

**14.** Did you receive the same error message when you ran Diagnostics this time?

**YES** - The problem is probably in the unit (system or expansion) that has the card your printer was attached to.

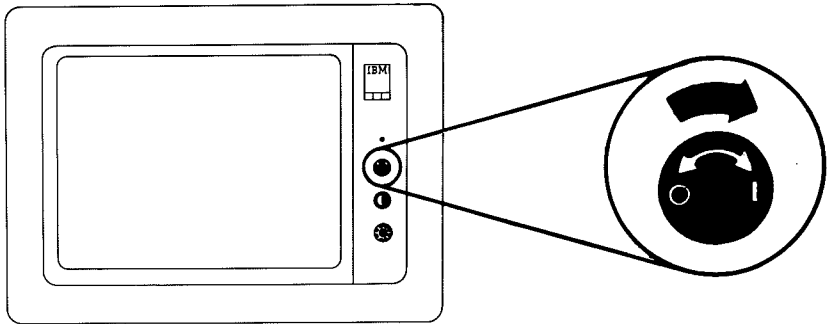
**NO** - Have the printer and cable serviced.

**15.** Your printer is also controlled by program commands from the system unit. If you have a printer problem only while running a particular program, examine the program thoroughly for commands being sent to the printer causing it to produce undesired results.

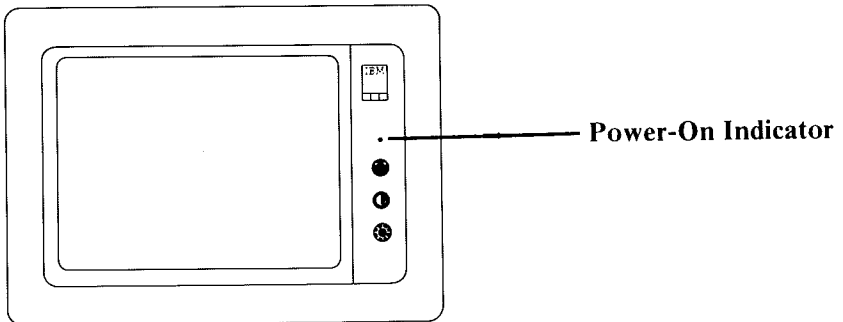
# IBM Color Display Problem Determination Procedures

If your IBM Color Display requires service, it must be returned with the power cord.

1. Set the Power control to On.



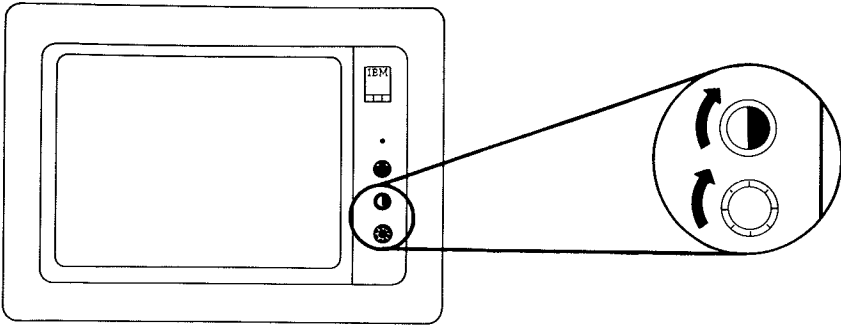
2. Is the Power-On indicator lit?



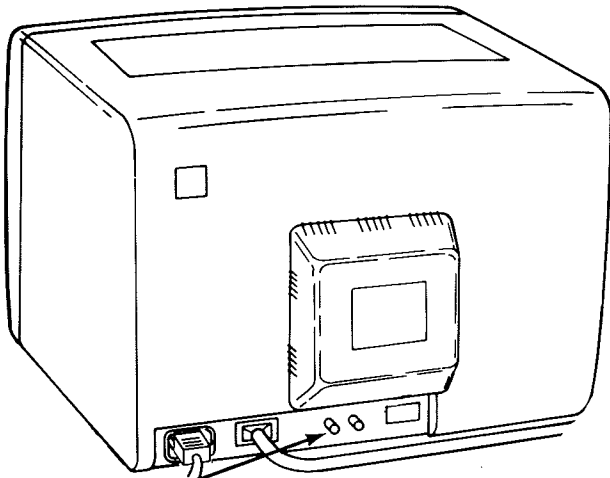
**YES** - Go to Step 3.

**NO** - Check that the power cord is plugged into a functioning wall outlet and the rear of the display. If it is, have the display serviced.

3. Set the Power switch on the system unit (and expansion unit, if attached) to Off.
4. Set the Brightness and Contrast controls fully clockwise.

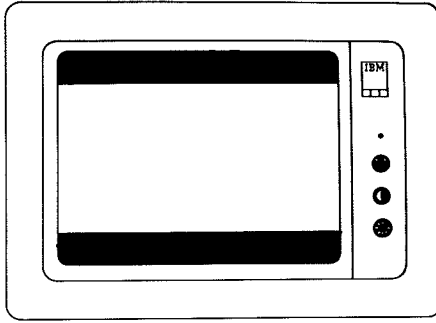


5. Turn the Vertical Size control fully counterclockwise. A black area should appear across the top and the bottom of the screen.



**Vertical Size  
Control**

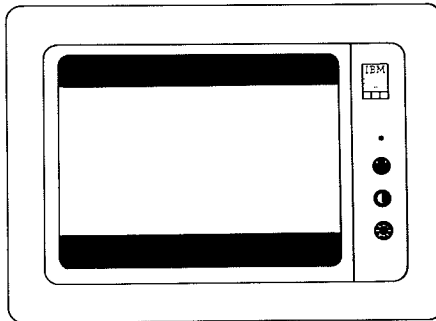
- 6.** Does a black area appear across the top and the bottom of the screen?



**YES** - Go to Step 7.

**NO** - Have the display serviced.

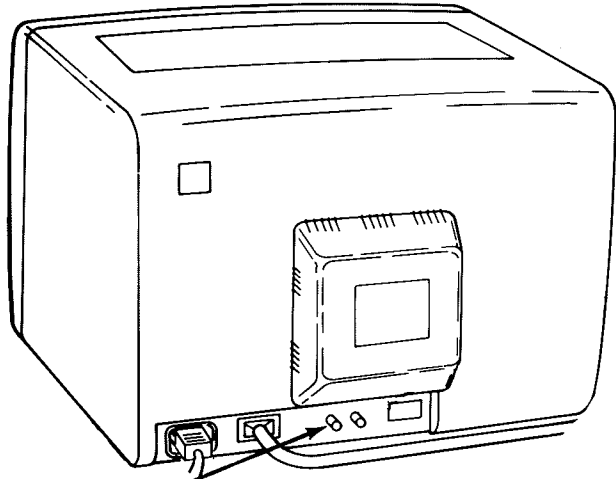
- 7.** Are the black areas at the top and bottom of the screen approximately equal in size?



**YES** - Go to Step 8.

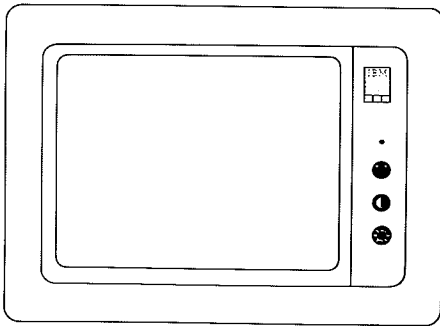
**NO** - Have the display serviced.

- 8.** Turn the Vertical Size control clockwise until the black areas at the top and bottom of the screen just disappear. If one of the black areas disappears before the other, continue to turn the control until the second black area is gone.



**Vertical Size  
Control**

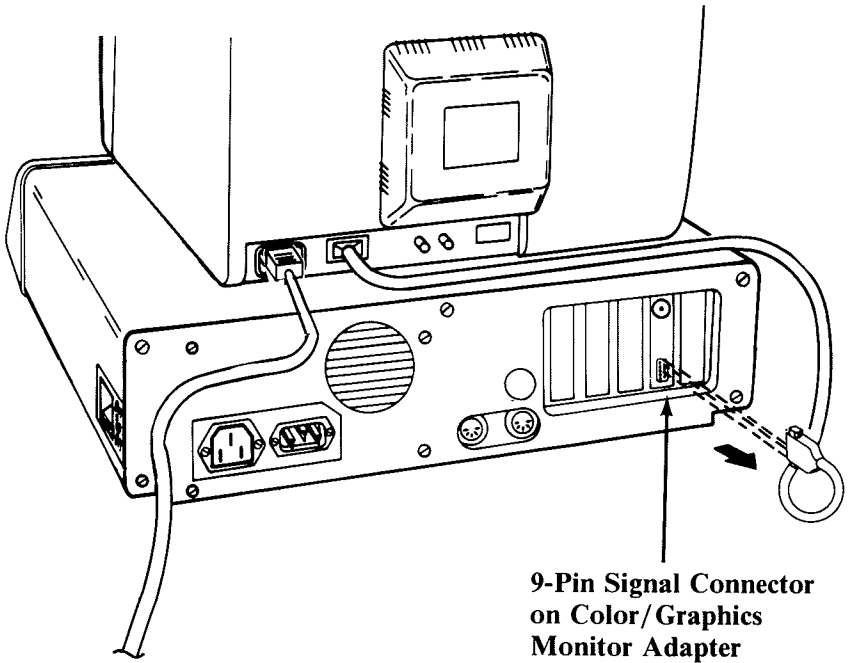
- 9.** Is the screen all white?



**YES** - Go to Step 14.

**NO** - Go to Step 10.

10. Set the Power control to Off.
11. Disconnect the display's signal cable from the Color/Graphics Monitor Adapter.



12. Set the Power control to On.
13. Is the screen white?
  - YES - Have the unit serviced that contains the Color/Graphics Monitor Adapter.
  - NO - Have the display serviced.
14. While watching the screen, set the Power switch on the expansion unit (if attached) and the system unit to On.

- 15.** Did the screen change from white to black as soon as the Power switch on the unit having the Color/Graphics Monitor Adapter was set to On? (This totally black condition may last only 3 seconds before the display changes again.)

**YES** - Go to Step 16.

**NO** - Have the display serviced.

- 16.** Wait for the Power-on self test (POST) to complete. The IBM Personal Computer BASIC message will appear (if a diskette is not loaded or an operating system is not booted from the fixed disk drive) with a blinking cursor.

```
The IBM Personal Computer Basic Version  
CX.XX Copyright IBM Corp. XXXX  
***** Bytes free  
OK
```

```
1LIST 2RUN 3LOAD 4SAVE 5CONT 6LPT1 7TRON 8TROFF 9KEY 0SCREEN
```

- 17.** Is your screen blank?

**YES** - Have the unit serviced that contains the Color/Graphics Monitor Adapter.

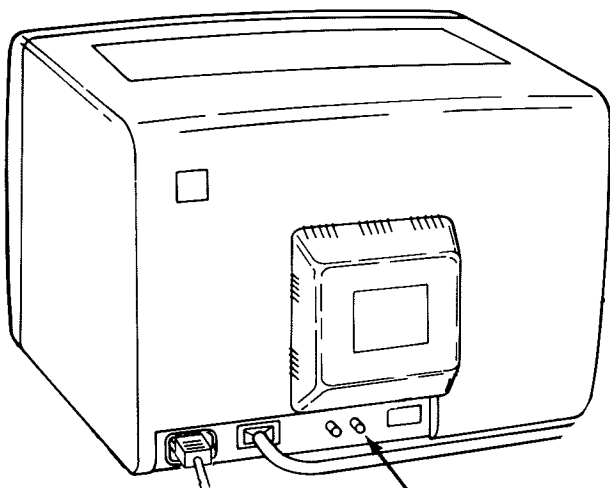
**NO** - Go to Step 18.

- 18.** Is your screen stable?

**YES** - Go to Step 21.

**NO** - Go to Step 19.

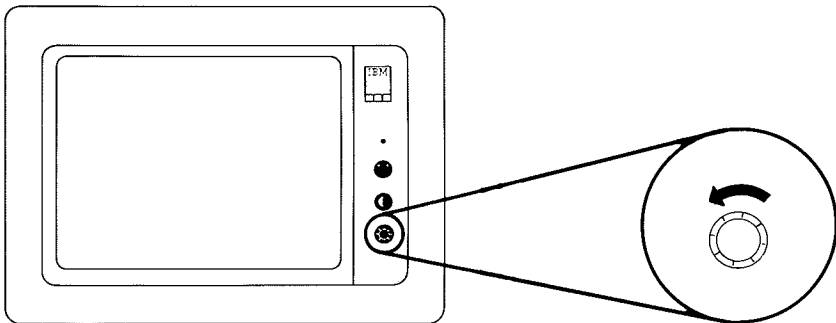
- 19.** Turn the Vertical Hold control clockwise as far as it will go, then turn it counterclockwise until the screen stops rolling and is stable.



**Vertical Hold  
Control**

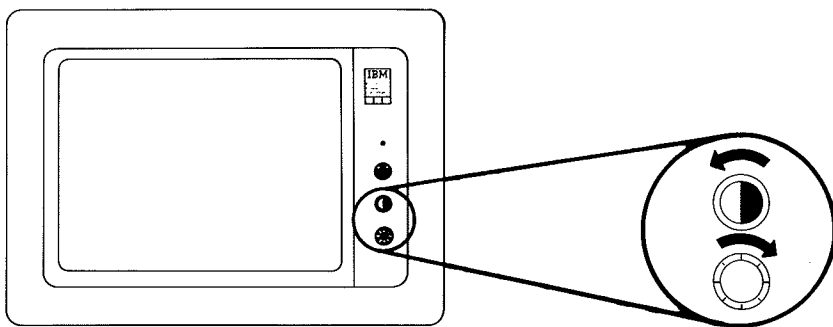
- 20.** Were you able to make the screen stable?
- YES** - Go to Step 21.
- NO** - Have the display serviced.
- 21.** Look at the screen. Does it have white characters on a dark background?
- YES** - Go to Step 27.
- NO** - Go to Step 22.

- 22.** Set the Power switch on the system unit (and expansion unit, if attached) to Off.
- 23.** Set the display's Power control to Off.
- 24.** Disconnect the display's signal cable from the Color/Graphics Monitor Adapter.
- 25.** Set the display's Power control to On.
- 26.** Is the screen white?  
**YES** - Have the unit serviced that contains the Color/Graphics Monitor Adapter.  
**NO** - Have the display serviced.
- 27.** Turn the Brightness control fully counterclockwise.



- 28.** Does the intensity of the characters decrease?  
**YES** - Go to Step 29.  
**NO** - Have the display serviced.

- 29.** Turn the Brightness control fully clockwise. Turn the Contrast control fully counterclockwise.

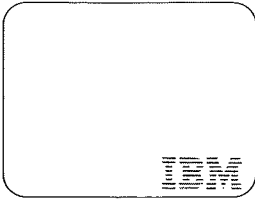


- 30.** Does the intensity of the characters decrease?

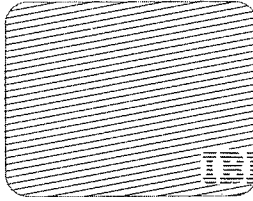
**YES** - Go to Step 31.

**NO** - Have the display serviced.

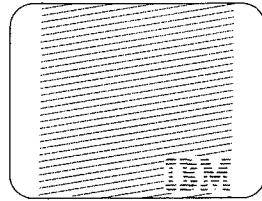
**31.** Turn the Contrast control fully clockwise. Look at the following examples.



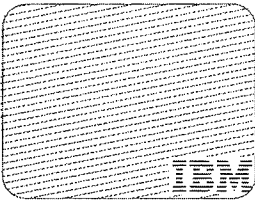
**Too Dim**



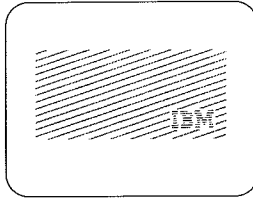
**Too Wide**



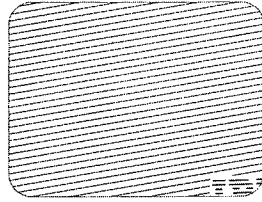
**Too Narrow**



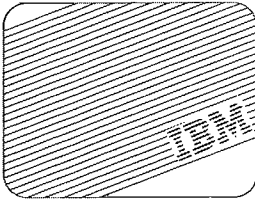
**Out of Focus**



**Shrunken**



**Characters shifted left or right or up and down off the display area**



**Tilted**

**32.** Is your problem similar to one of the examples?

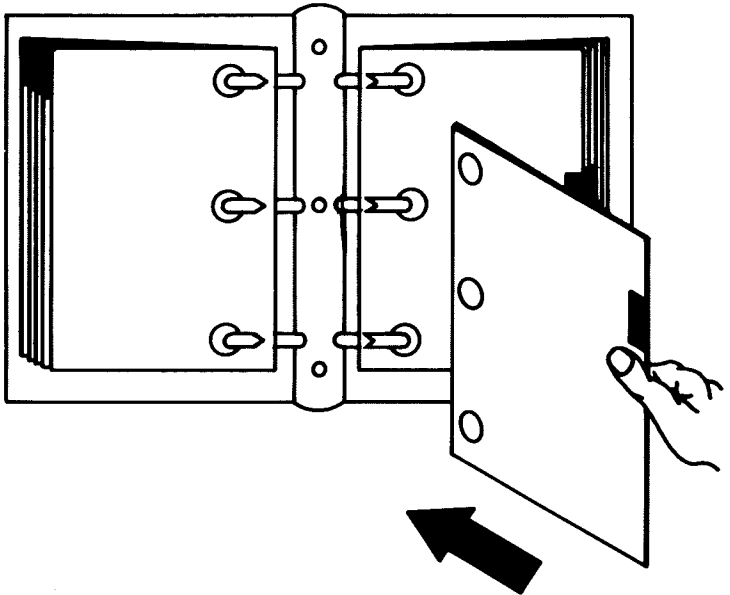
**YES** - Have the display serviced.

**NO** - Go to "Diagnostic Testing" in this section.

# SECTION 5. OPTIONS

## Introduction

This section has been provided to contain the option installation instructions for the options you purchased for your IBM Personal Computer. After your option has been installed, file the installation instructions under the appropriate bleeder tab, as shown in the figure below.



# SECTION 5. OPTIONS

## Contents

**Introduction**

**IBM Monochrome Display**

**IBM Monochrome Display and Printer Adapter**

**Color/Graphics Monitor Adapter**

**IBM Color Display**

**IBM Printers**

**Printer Adapter**

**5¼ Inch Diskette Drive**

**5¼ Inch Diskette Drive Adapter**

**16KB Memory Module Kit**

**64KB Memory Module Kit**

**64/256KB Memory Expansion**

**Game Control Adapter**

**Asynchronous Communications Adapter**

**Prototype Card**

**Synchronous Data Link Control (SDLC)  
Communications Adapter**

**IBM Communications Adapter Cable**

**IBM Personal Computer Expansion Unit**

**Synchronous Data Link Control (SDLC)  
Communications Adapter**

**IBM Communications Adapter Cable**

DISPLAYS

PRINTERS

DISKETTE/DISK

MEMORY

GENERAL

COMMUNICATIONS

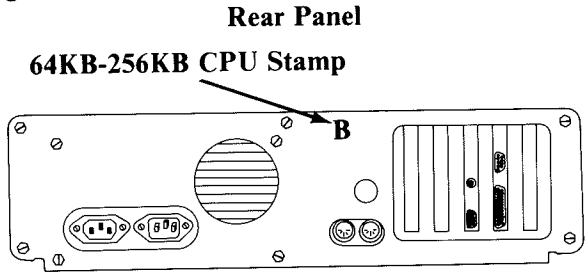
SWITCH SETTINGS

# Notes:

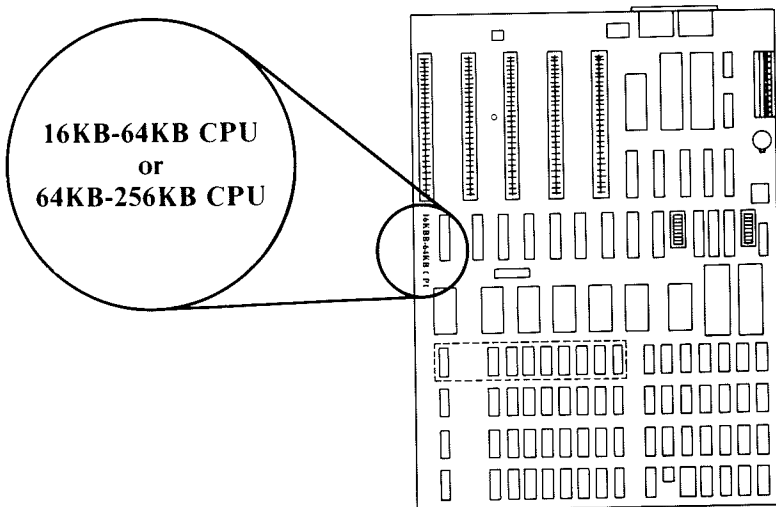
# Switch Setting Charts

Use the illustrations below to determine which system board is in your system unit.

- A 64KB-256KB system board has a "B" stamped on the rear panel and 64KB-256KB CPU printed on the system board. If you have this system board, go to page 5-28.
- A 16KB-64KB system board has no identification on the rear panel and 16KB-64KB CPU is printed on the system board. If you have this system board, go to page 5-2.



No "B" stamp indicates a 16KB-64KB CPU.



# 16K-64K System Board

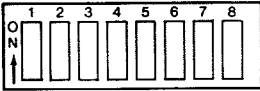
To use the following switch setting charts, your system should have no "B" stamped on the rear panel and the system board should have 16KB-64KB CPU printed on the side.

# Switch Setting Charts

## System Board Switches

**WARNING:** Before you change any switch settings, make a note of how the switches are presently set.

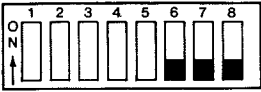
### Switch Block 1



Switch	Function
--------	----------

- |       |  |
|-------|--|
| 1,7,8 | Number of 5-1/4 inch diskette drives installed |
| 2     | Coprocessor                                    |
| 3,4   | System board memory switches                   |
| 5,6   | Type(s) of display(s) connected                |

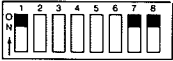
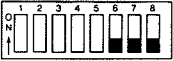
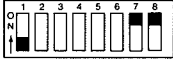


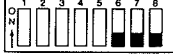
### Switch Block 2



Switch	Function
--------	----------


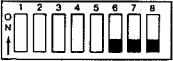
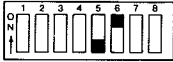
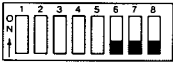
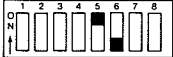
- |           |                                    |
|-----------|------------------------------------|
| 1,2,3,4,5 | Amount of memory options installed |
| 6,7,8     | Always in the Off position         |

# Number of 5-1/4 Inch Diskette Drives Installed

	Switch Block 1	Switch Block 2
0 - Drives		
1 - Drive		
2 - Drives		

## Type(s) of Display(s) Connected

**WARNING:** If an IBM Monochrome Display is connected to your system, Switch Block 1, switches 5 and 6, must always be Off. Damage to your display can result with any other switch settings.

IBM Monochrome Display (or IBM Monochrome Display plus another display)	Switch Block 1 	Switch Block 2 
Color Display (Do not use if an IBM Monochrome Display is connected)	Switch Block 1 	Switch Block 2 
		40x25 Mode
		80x25 Mode

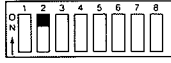
**Note:** The 40x25 mode means there will be 40 characters across the screen and 25 lines down the screen. The 40x25 is normally used with a home television. The 80x25 mode means there will be 80 characters across the screen and 25 lines down the screen. The 80x25 mode, when used with home televisions and various displays, can cause loss of character quality.

# Math Coprocessor

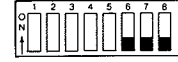
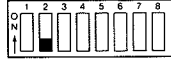
## Switch Block 1

## Switch Block 2

With Math Coprocessor

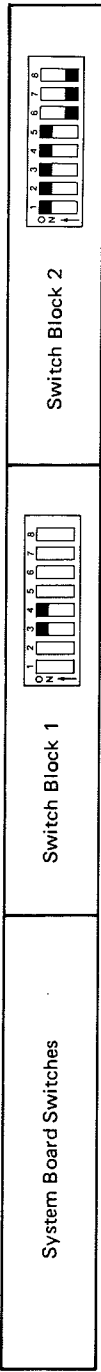


Without Math Coprocessor

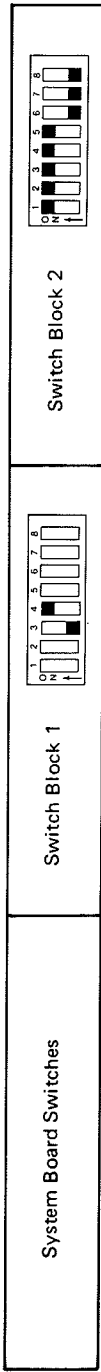


# Memory Switch Settings (16KB-64KB CPU) System Board

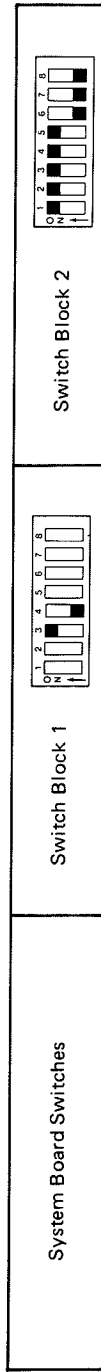
## 16K Total Memory



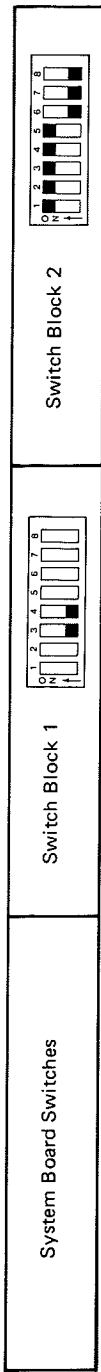
## 32K Total Memory





## 48K Total Memory



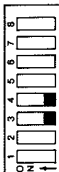
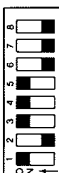
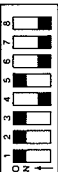
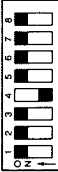
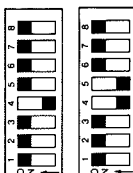
## 64K Total Memory






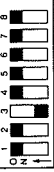
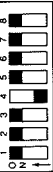



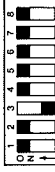
96K Total Memory  
32K + (64K on System Board)

System Board Switches	 <p>Switch Block 1</p>	 <p>Switch Block 2</p>
1 - 32K option	64/256K Option Card Switches	64K Option Card Switches
	32K Option Card Switches	


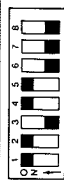

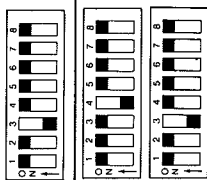
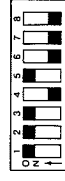
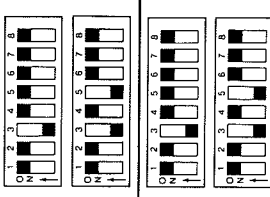

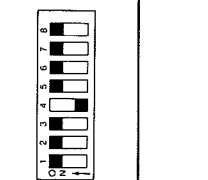


**128K Total Memory  
64K + (64K on System Board)**

System Board Switches	Switch Block 1 	Switch Block 2 	
1 - 64/256K option with 64K installed	64/256K Option Card Switches 	64K Option Card Switches 	32K Option Card Switches
1 - 64K option			
2 - 32K options			

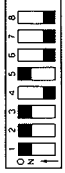

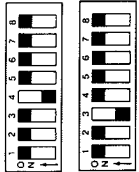


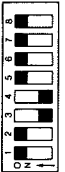
**160K Total Memory  
96K + (64K on System Board)**

System Board Switches	Switch Block 1 	Switch Block 2 
1 - 64/256K option with 64K installed 1 - 32K option	64/256K Option Card Switches 	32K Option Card Switches 
1 - 64K option 1 - 32K option		
3 - 32K options		  


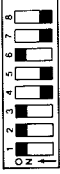


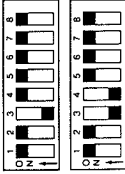
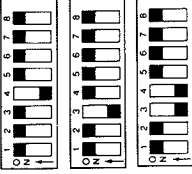
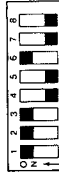
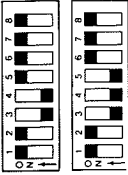
**192K Total Memory  
128K + (64K on System Board)**

System Board Switches	Switch Block 1	Switch Block 2
1 - 64/256K option with 64K installed 1 - 64K option		
2 - 64K options		
1 - 64/256K option with 64K installed 2 - 32K options		
1 - 64K option 2 - 32K options		
1 - 64/256K option with 128K installed		




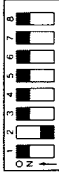
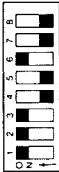
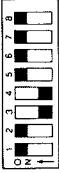

**224K Total Memory  
160K + (64K on System Board)**

System Board Switches	Switch Block 1	Switch Block 2
1 - 64/256K option with 64K installed 1 - 64K option 1 - 32K option	64/256K Option Card Switches 	32K Option Card Switches 
2 - 64K options 1 - 32K option	64K Option Card Switches 	
1 - 64/256K option with 128K installed 1 - 32K option		


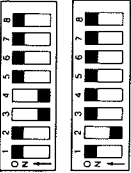

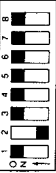
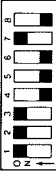
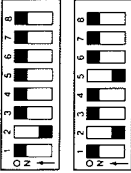


**256K Total Memory  
192K + (64K on System Board)**

System Board Switches	Switch Block 1	Switch Block 2	
1 - 64/256K option with 192K installed			32K Option Card Switches
1 - 64/256K option with 128K installed 1 - 64K option			64K Option Card Switches
1 - 64/256K option with 64K installed 2 - 64K options			
3 - 64K options			
1 - 64/256K option with 128K installed 2 - 32K options			


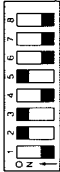
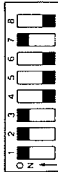
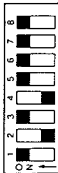
**288K Total Memory  
224K + (64K on System Board)**

System Board Switches	 <p align="center">Switch Block 1</p>	 <p align="center">Switch Block 2</p>	
<p>1 - 64/256K option with 192K installed 1 - 32K option</p>	<p align="center">64/256K Option Card Switches</p> 	<p align="center">64K Option Card Switches</p>	<p align="center">32K Option Card Switches</p> 
<p>1 - 64/256K option with 128K installed 1 - 64K option 1 - 32K option</p>			

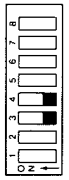
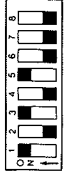
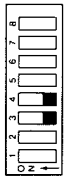
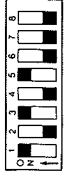
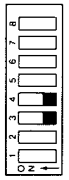
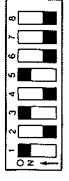
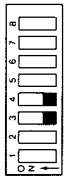
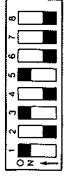

**320K Total Memory  
256K + (64K on System Board)**

System Board Switches	Switch Block 1	Switch Block 2
<p>1 - 64/256K option with 128K installed 2 - 64K options</p>	<p>64/256K Option Card Switches</p> 	<p>64K Option Card Switches</p> 
<p>1 - 64/256K option with 192K installed 1 - 64K option</p>	<p>64/256K Option Card Switches</p> 	<p>32K Option Card Switches</p> 
<p>1 - 64/256K option with 192K installed 2 - 32K options</p>	<p>64/256K Option Card Switches</p> 	<p>32K Option Card Switches</p> 
<p>1 - 64/256K option with 256K installed</p>	<p>64/256K Option Card Switches</p> 	<p>32K Option Card Switches</p> 

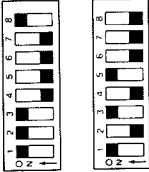
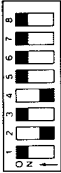
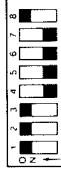

**352K Total Memory  
288K + (64K on System Board)**

System Board Switches	Switch Block 1	Switch Block 2
1 - 64/256K option with 192K installed 1 - 64K option 1 - 32K option		
1 - 64/256K option with 256K installed 1 - 32K option		

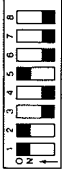
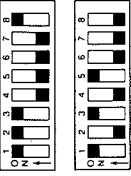


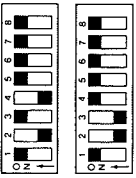
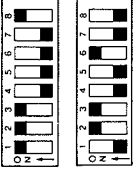
384K Total Memory  
320K + (64K on System Board)

System Board Switches	Switch Block 1	Switch Block 2		
1 - 64/256K option with 192K installed 2 - 64K options			64/256K Option Card Switches	64K Option Card Switches
1 - 64/256K option with 256K installed 1 - 64/256K option with 64K installed				
1 - 64/256K option with 256K installed 1 - 64K option				
1 - 64/256K option with 256K installed 2 - 32K options				

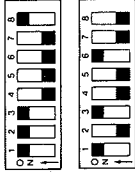
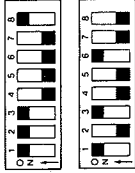

**416K Total Memory  
352K + (64K on System Board)**

System Board Switches	Switch Block 1	Switch Block 2
<p>1 - 64/256K option with 256K installed                      1 - 64/256K option with 64K installed                      1 - 32K option</p>	<p>64/256K Option Card Switches</p> 	<p>64K Option Card Switches</p> 
<p>1 - 64/256K option with 256K installed                      1 - 64K option                      1 - 32K option</p>	<p>64/256K Option Card Switches</p> 	<p>32K Option Card Switches</p> 

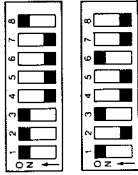
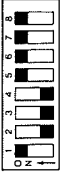
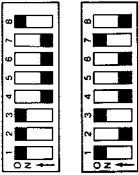
**448K Total Memory  
384K + (64K on System Board)**

System Board Switches	Switch Block 1	Switch Block 2	
<p>1 - 64/256K option with 256K installed                      1 - 64/256K option with 64K installed                      1 - 64K option</p>	<p>64/256K Option Card Switches</p> 	<p>64K Option Card Switches</p> 	<p>32K Option Card Switches</p>
<p>1 - 64/256K option with 256K installed                      2 - 64K options</p>			
<p>1 - 64/256K option with 256K installed                      1 - 64/256K option with 128K installed</p>			

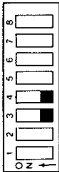

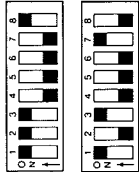
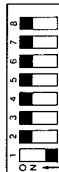
**480K Total Memory  
416K + (64K on System Board)**

System Board Switches	Switch Block 1	Switch Block 2
<p>1 - 64/256K option with 256K installed                      1 - 64/256K option with 128K installed                      1 - 32K option</p>	<p>64/256K Option Card Switches</p> 	<p>64K Option Card Switches</p>
<p>1 - 64/256K option with 256K installed                      1 - 64/256K option with 128K installed                      1 - 32K option</p>	<p>64/256K Option Card Switches</p> 	<p>32K Option Card Switches</p> 

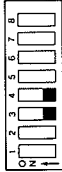

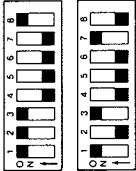

**512K Total Memory  
448K + (64K on System Board)**

System Board Switches	Switch Block 1	Switch Block 2
<p>1 - 64/256K option with 256K installed                      1 - 64/256K option with 128K installed                      1 - 64K option</p>	<p>64/256K Option Card Switches</p> 	<p>64K Option Card Switches</p> 
<p>1 - 64/256K option with 256K installed                      1 - 64/256K option with 192K installed</p>		<p>64K Option Card Switches</p>

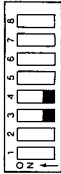
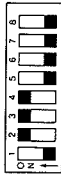
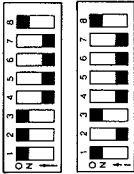

**544K Total Memory  
480K + (64K on System Board)**

System Board Switches	Switch Block 1 	Switch Block 2 
	64K Option Card Switches	32K Option Card Switches
<p>1 - 64/256K option with 256K installed            1 - 64/256K option with 192K installed            1 - 32K option</p>		

**576K Total Memory  
512K + (64K on System Board)**

System Board Switches	Switch Block 1 	Switch Block 2 
<p>1 - 64/256K option with 256K installed                      1 - 64/256K option with 192K installed                      1 - 64K option</p>	<p>64/256K Option Card Switches</p> 	<p>64K Option Card Switches</p> 
<p>2 - 64/256K option with 256K installed</p>		<p>32K Option Card Switches</p>


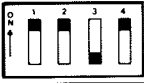




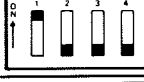



**608K Total Memory  
544K + (64K on System Board)**

System Board Switches	Switch Block 1 	Switch Block 2 
2 - 64/256K option with 256K installed 1 - 32K option	64/256K Option Card Switches 	64K Option Card Switches
		32K Option Card Switches 

**640K Total Memory  
576K + (64K on System Board)**

System Board Switches	Switch Block 1	Switch Block 2
<p>2 - 64/256K option with 256K installed 1 - 64K option</p>	<p>64/256K Option Card Switches</p>	<p>64K Option Card Switches</p>
<p>2 - 64/256K option with 256K installed 1 - 64/256K option with 64K installed</p>		<p>32K Option Card Switches</p>

# Extender Card Switch Settings

System Memory	Extender Card Switch Block	Memory Segment
16K to 64K		1
96K to 128K		2
160K to 192K		3
224K to 256K		4
288K to 320K		5
352K to 384K		6
416K to 448K		7
480K to 512K		8
544K to 576K		9
608K to 640K		A

# Notes:

# 64K-256K System Board

To use the following switch setting charts, your system should have a "B" stamped on the rear panel and the system board should have 64KB-256KB CPU printed on the side.

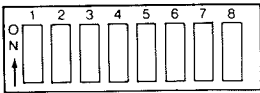
**Notes:**

# Switch Setting Charts

## System Board Switches

**WARNING:** Before you change any switch settings, make a note of how the switches are presently set.

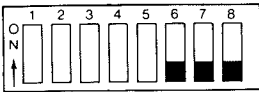
### Switch Block 1



Switch	Function
--------	----------

1,7,8	Number of 5-1/4 inch diskette drives installed
2	Coprocessor
3,4	System board memory switches
5,6	Type(s) of display(s) connected

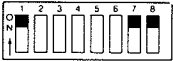
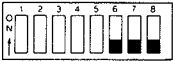
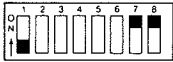

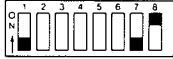

### Switch Block 2



Switch	Function
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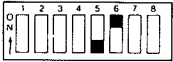

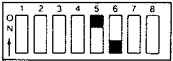
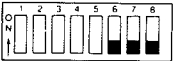
1,2,3,4,5	Amount of memory options installed
6,7,8	Always in the Off position

# Number of 5-1/4 Inch Diskette Drives Installed

	Switch Block 1	Switch Block 2
0 - Drives		
1 - Drive		
2 - Drives		

## Type(s) of Display(s) Connected

**WARNING:** If an IBM Monochrome Display is connected to your system, Switch Block 1, switches 5 and 6, must always be Off. Damage to your display can result with any other switch settings.

IBM Monochrome Display (or IBM Monochrome Display plus another display)	Switch Block 1 	Switch Block 2 
Color Display (Do not use if an IBM Monochrome Display is connected)	Switch Block 1 	Switch Block 2 
		40x25 Mode
		
		80x25 Mode

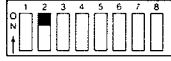
**Note:** The 40x25 mode means there will be 40 characters across the screen and 25 lines down the screen. The 40x25 is normally used with a home television. The 80x25 mode means there will be 80 characters across the screen and 25 lines down the screen. The 80x25 mode, when used with home televisions and various displays, can cause loss of character quality.

# Math Coprocessor

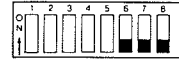
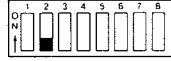
## Switch Block 1

## Switch Block 2

With Math Coprocessor

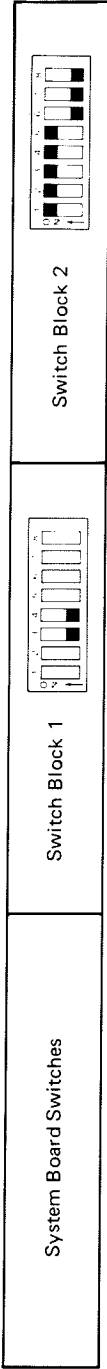


Without Math Coprocessor

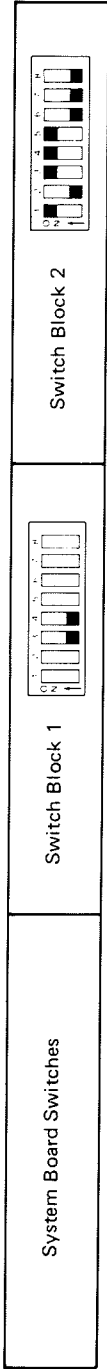


# Memory Switch Settings (64KB-256KB CPU) System Board

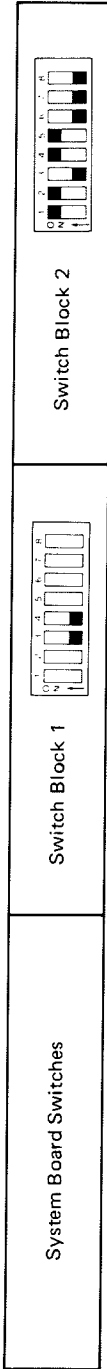
## 64K Total Memory



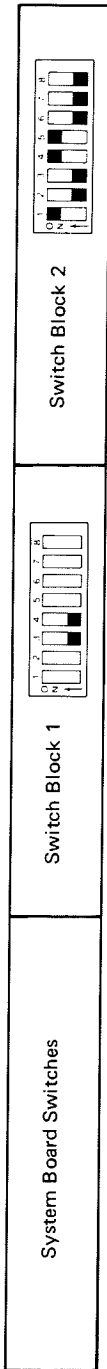
## 128K Total Memory



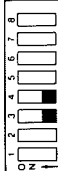
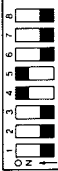
## 192K Total Memory



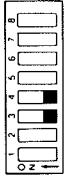
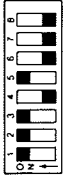
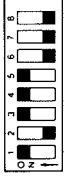

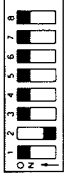
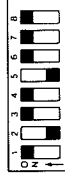
## 256K Total Memory



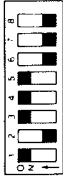



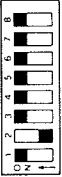


**288K Total Memory  
32K + (256K on System Board)**

System Board Switches	 <p align="center">Switch Block 1</p>	 <p align="center">Switch Block 2</p>
1 - 32K option	64/256K Option Card Switches	32K Option Card Switches

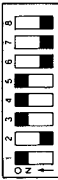

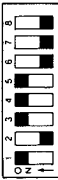
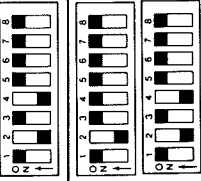
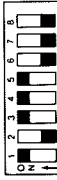
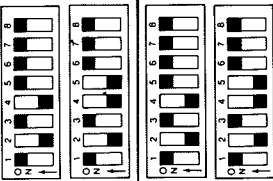
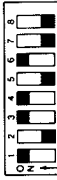

**320K Total Memory  
64K + (256K on System Board)**

System Board Switches	 <p align="center">Switch Block 1</p>	 <p align="center">Switch Block 2</p>	
1 - 64/256K option with 64K installed	 <p align="center">64/256K Option Card Switches</p>	64K Option Card Switches	
1 - 64K option			
2 - 32K options			 

**352K Total Memory  
96K + (256K on System Board)**

System Board Switches	Switch Block 1	Switch Block 2
1 - 64/256K option with 64K installed 1 - 32K option	64/256K Option Card Switches 	32K Option Card Switches 
1 - 64K option 1 - 32K option	64K Option Card Switches 	32K Option Card Switches 
3 - 32K options		  

**384K Total Memory  
128K + (256K on System Board)**

System Board Switches	Switch Block 1	Switch Block 2
1 - 64/256K option with 64K installed 1 - 64K option		
2 - 64K options		
1 - 64/256K option with 64K installed 2 - 32K options		
1 - 64K option 2 - 32K options		
1 - 64/256K option with 128K installed	