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VEGA

SERIES

video 7

User's Manual

Video-7 Enhanced Graphics Adapter for the IBM PC family fully compatible with 256K EGA, CGA, MDA, and Hercules.

VEGA

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FCC ID:D2A62LVEGA

Certified to comply with Class B limits, Part 15 of FCC Rules.
See Instructions if interface to radio reception is suspected.

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Radio and Television Interference

The equipment described in this manual generates radio- frequency energy. If it is not installed properly it may cause interference with radio and television reception. The monitor you purchase must comply with the limits for Class B computing devices in accordance with the specifications in Subpart J, Part 15, of FCC rules. These rules are designed to provide reasonable protection against such interference in a residential installation.

The cable connection between the computer and the monitor must be a shielded cable with the shield properly grounded. You can determine if your equipment is the cause of interference by turning it off. If the interference stops, it was probably caused by the computer or the monitor. To correct the problem try:

1. Turning the TV or radio antenna until the interference stops.
2. Moving the computer farther away from the TV or radio.
3. Moving the computer from one side of the TV or radio to the other.
4. Plugging the computer into an outlet that is on a different circuit breaker or fuse than the TV or radio.
5. Installing a rooftop antenna connected to your TV and radio with coaxial cable.
6. Indentifying the offending piece of hardware by selectively turning them off one at a time and checking for interference.

If necessary, you should consult your computer dealer for additional suggestions. You may find the booklet "How to Identify and Resolve Radio-TV Interference Problems" prepared by the Federal Communications Commission helpful. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402. Refer to Stock Number: 004-000-00345-4.

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GETTING STARTED

The Video-7 Enhanced Graphics Adapter (VEGA), is a high resolution, advanced graphics adapter for the IBM PC series computer, designed to be fully compatible with the IBM Enhanced Graphics Adapter.

While the VEGA is compatible with the new EGA enhanced graphics modes, it also has the ability to emulate the IBM Color Graphics, IBM Monochrome Display Adapters, and Hercules Graphics Card.

Because it can emulate each of these display adapters, the VEGA will let you run software that is written for each separate adapter. The VEGA is compatible with virtually any software package written for the IBM PC, PC/XT or PC/AT.

Even though the VEGA is fully compatible with the IBM EGA, that is where the similarity ends...

The VEGA comes equipped with 256K of memory on board when you buy it. This means the VEGA is fully configured to display all of the EGA graphics modes without you having to buy a special Memory Expansion Card and Memory Module Kit.

The VEGA is compatible with more software than the IBM EGA. The VEGA supports software written for the Enhanced Graphics Adapter, the Color Graphics Adapter, the Monochrome Display Adapter, AND the Hercules Graphics Card.

The VEGA has more graphics power, more memory, and more graphics modes than the standard IBM EGA. The VEGA is easier to install, does not require additional expansion kits, and costs about half the price of the standard IBM EGA.

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The VEGA supports all of the features of the IBM Enhanced Graphics Adapter, Color Graphics Adapter, and Monochrome Display Adapter, including support of the Hercules Graphics Card features. The following list is an overview of some of these features:

- Supports three different monitor types:
  - IBM Enhanced Graphics Display
  - IBM Color Display
  - IBM Monochrome Display
- 640 x 350, four color monochrome graphics
- 720 x 348, Hercules compatible graphics
- 640 x 200 and 320 x 200, 16 color graphics
- 640 x 350, 16 color graphics (from a color palette of up to 64 different colors)
- RAM-based, loadable character generator capable of up to 512 displayable character codes for multiple character fonts
- Supports up to 43 lines of 80 column text
- Smooth, flicker free Horizontal and Vertical scrolling
- 256K on board memory supports up to 8 graphics pages in 320 x 200, 16 color mode
- IBM EGA "Feature Adapter" compatible connector

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- IBM EGA BIOS extension compatibility (on board 16K ROM)

- Designed using advanced custom chip (VLSI) technology for speed, reliability, and compatibility

- Two Year Warranty. If something goes wrong with the VEGA, Video-7 will, under the terms of our warranty, repair or replace it free of charge, for up to two years from the purchase date.

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SYSTEM REQUIREMENTS

The VEGA can reside in any open system expansion slot of the IBM PC, PC/XT, PC/AT or 100% PC compatible computers.

ROM MODULE NOTE

If the VEGA is to be installed in an IBM PC or PC/XT manufactured before April 1983, you must have the new ROM module installed on the system board BEFORE you install the VEGA. If you have an IBM PC/AT you will not need to check the manufacturing date. PC compatibles should be checked by the dealer.

You can find out the date of the ROM module installed in your IBM PC by running the **ROMDATE.COM** program on the VEGA Utility Disk.

To run the program, use the following steps:

Step 1 — Place your IBM DOS disk in Drive A:, and boot up your system.

Step 2 — Replace the DOS disk with the VEGA Utility Disk.

Step 3 — At the system prompt, Type: **ROMDATE** (then press **RETURN**)

The program will print out the date of the ROM module installed in your PC. If the date is earlier than "10/27/82", you will need to see your dealer to get an updated ROM module.

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VEGA INSTALLATION

The VEGA can be easily installed in minutes by following these simple instructions. There are three different sections dealing with VEGA Installation. The first section explains VEGA installation in the IBM PC and IBM PC/XT, the second section explains installation in the IBM PC/AT, and the third section explains VEGA installation in IBM compatible computers.

Each individual section will help you step through the installation.

First, there are several preliminary steps you will need to perform, such as disconnecting the computer cables and cover. Next the VEGA switches, and the computer's system switch settings, will need to be set. After the switches have been set the VEGA can be installed in your system. Once the VEGA has been installed you will need to replace the system cover, and connect all the cables and cords.

TOOLS NEEDED

The following tools will aid you in the installation of the VEGA:

- Medium "flat-blade" screwdriver
- Small "flat-blade" screwdriver (optional)
- 3/16" nutdriver (optional)
- 1/4" nutdriver (optional)

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VEGA INSTALLATION IN THE IBM PC AND PC/XT

GETTING THE COMPUTER READY FOR INSTALLATION

Before you can install the VEGA you will need to perform the following steps to get your IBM PC or PC/XT ready for the installation. Follow steps 1 through 6 carefully:

Step 1 — Turn off the power to the computer and unplug the PC power cord from the wall outlet.

Step 2 — Turn off the power to any external devices, such as your monitor or printer.

Step 3 — Disconnect all of the cables that may be attached to the rear of the computer.

Step 4 — Move any external devices, including the keyboard, away from the computer.

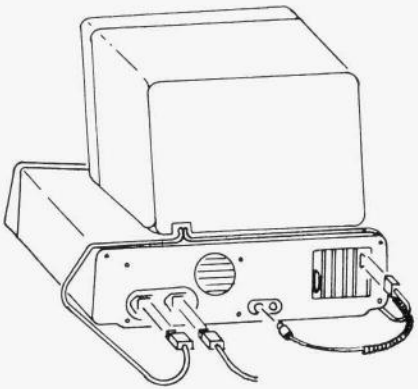


FIGURE 1

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Step 5 Using a screwdriver (or 1/4" nutdriver), remove the cover mounting screws at the rear of the computer (be sure to store the screws in a safe place).

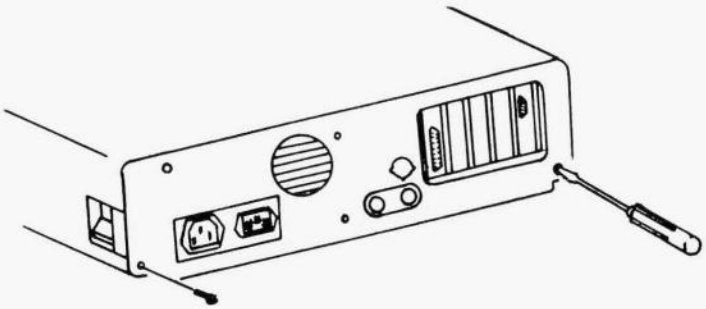


FIGURE 2

Step 6 Now, from the front of the computer, hold onto both sides of the system cover, and slide it carefully toward you. When the rear edge of the cover reaches the front of the PC, tilt the front of the cover upward, and remove it from the computer (be sure to store the cover in a safe place).

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SYSTEM SWITCHES

Now that you have the main circuit board of the PC exposed it will be easy to set the computer system switches. Follow steps 1 and 2 carefully:

Step 1 — Using the diagram below, locate Switch Block 1. If you have a PC/XT You will notice that it has only one Switch Block.

Step 2 — Switch Block 1 has 8 individual switch settings. Set switches 5 and 6 ON. Do Not change any other switches.

Step 3 — (For PC/XT only). If you are installing the "Short Card" VEGA into the PC/XT short slot (slot 8) you will first need to set the VEGA "Slot-8" Jumper Block. See Appendix A for more information.

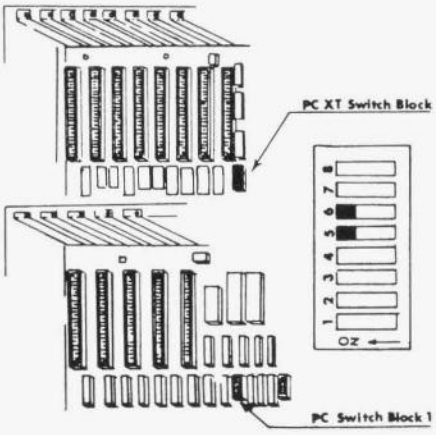


FIGURE 3

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VEGA SWITCHES

The VEGA has a switch block with 6 individual switch settings and a display toggle switch. You can set the VEGA switches by referring to Appendix A, and following the instructions given there. There are two basic questions you will need to answer before you refer to the VEGA switch section in Appendix A:

1. What display adapters will you have installed in your system? The VEGA can co-exist with an IBM compatible color graphics or monochrome display adapter, or it can reside in your system alone.

2. What type of monitor will you be using? The VEGA can use the Enhanced Color Display, the Color Display or the Monochrome Display (or compatible display units).

Turn now to the Appendix A and set the VEGA switches according to your individual needs.

You are now ready to place the VEGA into your PC. Follow steps 1 through 4 carefully:

Step 1 Find an empty expansion slot for the VEGA. If the expansion slot still has the expansion slot cover attached, remove it with a screwdriver (or 3/16" nutdriver) and store it away.

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Step 2 Hold the VEGA firmly, at the top edge of the board, and press the gold edge-connector into the expansion slot as shown in figure 4 below.

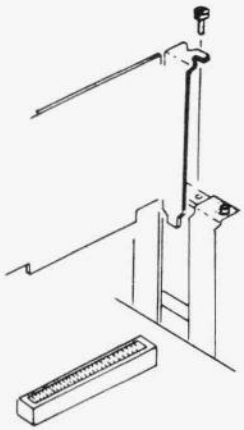


FIGURE 4

Step 3 Line up the retaining bracket with the screw hole in the rear plate of the system unit.

Step 4 Use your screwdriver (or 3/16" nutdriver) to screw the VEGA's retaining bracket tightly against the rear plate of the system unit.

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Your VEGA is now installed in your PC. The only thing left to do is to put your system back together again. Follow steps 1 through 7 carefully:

Step 1 — Gently push your ribbon cables down and out of the way. This will protect them from the system cover when you slide it back on.

Step 2 — From the front of the computer, hold onto both sides of the system cover, and slide the cover towards the rear of the system.

Step 3 — Carefully align the cover mounting screws with the threaded screw holes at the rear of the computer and use the screwdriver (or 1/4" nutdriver) to tighten them.

Step 4 — Return your external devices (such as your keyboard or monitor) to their original locations.

Step 5 — Reconnect all of the cables that were previously attached to the rear of the computer.

Step 6 — Attach your monitor cable to the VEGA's 9 pin connector (see Appendix B for more information about monitors and cables).

Step 7 — Your system should now be ready to run.

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VEGA INSTALLATION IN THE IBM PC/AT

GETTING THE COMPUTER READY FOR INSTALLATION

Before you can install the VEGA you will need to perform the following steps to get your IBM PC/AT ready for the installation. Follow steps 1 through 8 carefully.

Step 1 — Turn off the computer's power and unlock your PC/AT (if it is not unlocked already) by turning the key counterclockwise. Remove the key.

Step 2 — Unplug the PC/AT power cord from the wall outlet.

Step 3 — Turn off the power to any external devices, such as your monitor or printer.

Step 4 — Disconnect all of the cables that may be attached to the rear of the computer.

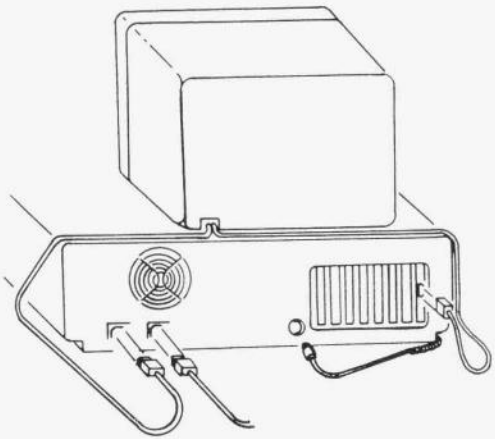


FIGURE 5

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Step 5 Move any external devices, including the keyboard, away from the computer.

Step 6 Remove the back panel from the PC/AT by unfastening the panel from the plastic fastener strips.

Step 7 Using the screwdriver (or 1/4" nutdriver), remove the 5 cover mounting screws at the rear of the computer (be sure to store the screws in a safe place).

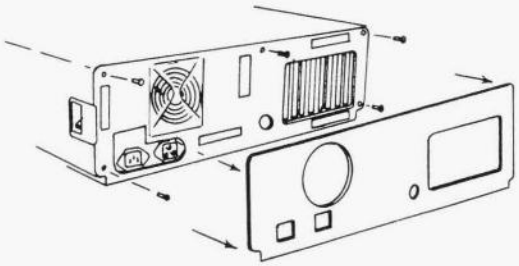


FIGURE 6

Step 8 Now, from the front of the computer, hold onto both sides of the system cover, and slide it carefully toward you to remove it from the computer (be sure to store the cover in a safe place).

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SYSTEM SWITCHES

The IBM PC/AT does not have any hardware switches on the main system circuit board for you to configure for the VEGA as the IBM PC or PC/XT computers do. Instead IBM supplies PC/AT owners with a Diagnostics Disk which has a menu run program to enable you to setup the AT for the type of graphics device you are operating. You will need to use the IBM Diagnostics "SETUP" program to configure your PC/AT for the VEGA. (You may want to check your PC/AT Guide to Operations at this point.)

VEGA SWITCHES

The VEGA has a switch block with 5 individual switch settings and a display toggle switch. You can set the VEGA switches by referring to Appendix A, and following the instructions given there. There are two basic questions you will need to answer before you refer to the VEGA switch section in Appendix A:

1. What display adapters will you have installed in your system? The VEGA can co-exist with an IBM compatible color graphics or monochrome display adapter, or it can reside in your system alone.

2. What type of monitor will you be using? The VEGA can use the Enhanced Color Display, the Color Display or the Monochrome Display (or compatible display units).

Turn now to Appendix A and set the VEGA switches according to your individual needs.

You are now ready to place the VEGA into your PC/AT. Follow steps 1 through 4 carefully:

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Step 1 Find an empty expansion slot for the VEGA. If the expansion slot still has the expansion slot cover attached, remove it with your screwdriver (or 3/16" nutdriver) and store it away.

Step 2 Hold the VEGA firmly, at the top edge of the board, and press the gold edge-connector into the expansion slot as shown in figure 7.

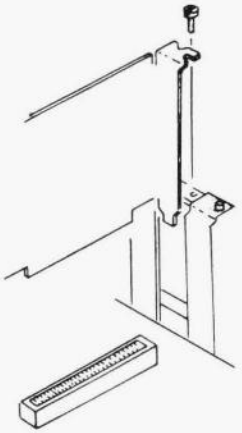


FIGURE 7

Step 3 Line up the retaining bracket with the screw hole in the rear plate of the system unit.

Step 4 Use your screwdriver (or 3/16" nutdriver) to screw the VEGA's retaining bracket tightly against the rear plate of the system unit.

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Your VEGA is now installed in your PC/AT. The only thing left to do is to put your system back together again. Follow steps 1 through 8 carefully:

Step 1 — Gently push your ribbon cables down and out of the way. This will protect them from the system cover when you slide it back on.

Step 2 — From the front of the computer, hold onto both sides of the system cover, and slide the cover towards the rear of the system.

Step 3 — Carefully align the cover mounting screws with the threaded screw holes at the rear of the computer and use the screwdriver (or 1/4" nutdriver) to tighten them.

Step 4 — Reinstall the back panel by pressing the plastic fastening strips together.

Step 5 — Return your external devices (such as your keyboard or monitor) to their original locations.

Step 6 — Reconnect all of the cables that were previously attached to the rear of the computer.

Step 7 — Attach your monitor cable to the VEGA's 9 pin connector (see Appendix B for more information about monitors and cables).

Step 8 — Your system should now be ready to run.

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VEGA INSTALLATION IN IBM COMPATIBLES

Most IBM PC compatible computers are constructed similar to the PC, PC/XT or PC/AT, and therefore VEGA installation in these machines will be similar. However, due to the number of PC compatible computers on the market, listing instructions for each machine would take much more room than the VEGA manual provides. Because of this, we do not provide installation instructions for a PC compatible in this manual. The Video-7 Technical Support Department can provide you with more information concerning installation in a PC compatible.

The following information may be used as guideline in VEGA installation in PC compatibles.

Generally, there are three types of IBM PC compatible computers:

1. **LAPTOPS**: For obvious reasons, the VEGA will not work with a laptop portable. Laptops do not offer expansion slots, and generally use a liquid crystal display video output.

2. **PORTABLES**: Most PC compatible portables have their own video circuitry and screen built in as an integral part of their system. Since the VEGA conforms to the video standards set forth by IBM, you must make sure that the video of your particular PC compatible conforms to these same standards if you wish to install the VEGA in your system.

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3. **DESKTOPS:** PC compatibles designed for desktop use are usually designed to allow IBM compatible graphic card expandability, similar to the IBM PC desktop computers. If your compatible has its own video circuitry built in, or if it has its own exclusive monitor and graphics card you may need to check with your dealer to find out if the computer is IBM video circuitry compatible.

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USING THE VEGA

The VEGA is an extremely versatile graphics interface for your PC, it actually takes the place of four different graphics adapters. The VEGA will work with all existing IBM PC software written for the IBM Enhanced Graphics Adapter, the IBM Color Graphics Adapter, and the IBM Monochrome Display Adapter, and includes compatibility with Hercules Graphics Card software. Not only will the VEGA emulate each one of these graphics adapters, but the VEGA will make use of their individual display monitors, including the IBM Enhanced Display, Color Display, and Monochrome Display (or any IBM compatible monitors).

This section explains how to make the VEGA work with various software and monitor configurations. Even though the VEGA was designed to be fully IBM EGA compatible, it can emulate each one of the other three PC graphic adapter standards with the help of a program on the VEGA Utility Disk. In this section you will be introduced to the Utility Disk, software compatibility and Vega graphics adapter emulation. Later, the section will explain monitor compatibility, and how to choose a monitor which best suits your needs.

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Below is a list of the different adapters the VEGA emulates, along with monitors the VEGA supports, with the mode capabilities of each:

Text Modes:	VEGA Emulates	Colors	Char Size	Screen Format (1)	Monitor Needed
	MDA, HGC	4	9x14	80 x 25	MD
	CGA (2)	16 (3)	8x8	40 x 25	CD, ED
	CGA (2)	16 (3)	8x8	80 x 25	CD, ED
	EGA	16(3)	8x14	80 x 25	ED

Graphics Modes:	VEGA Emulates	Colors	Graphics Resolution	Monitor Needed
	HGC (4)	2	720 x 348	MD
	EGA	3	640 x 350	MD
	CGA (2)	4	320 x 200	CD, ED
	CGA (2)	4	640 x 200	CD, ED
	EGA	16 (3)	320 x 200	CD, ED
	EGA	16 (3)	640 x 200	CD, ED
	EGA	16 (3)	640 x 350	ED

Adapters:
MDA: Monochrome Display Adapter
CGA: Color Graphics Display Adapter
EGA: Enhanced Graphics Adapter
HGC: Hercules Graphics Card

Monitors:
MD: Monochrome Display
CD: Color Display
ED: Enhanced Display

Notes:
(1) Horzontal Characters x Vertical Lines.
(2) Some CGA software may require VEGA.COM.
(3) 16 out of 64 when used with Enhanced Display.
(4) VEGA.COM program is needed to emulate HGC.

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Switch 5 on the VEGA switch block will permit the VEGA to emulate the Color Graphics Adapter or the Hercules Graphics Card. You must set this switch to ON when you wish to use the VEGA.COM program. Set switch 5 on the VEGA switch block to OFF if you are using the VEGA as a standard EGA. See Appendix A for more information about the VEGA switches.

THE VEGA UTILITY DISK - VEGA.COM

The diskette included with the VEGA has several useful programs. One of these programs, VEGA.COM, has a set of commands which expand the VEGA's features in several ways, among them:

CGA EMULATION	Setup the VEGA to be fully compatible with IBM Color Graphics Adapter software.
HGC EMULATION	Setup the VEGA to be fully compatible with Hercules graphic software.
SCREEN SAVER	Turn off the image on your monitor if you leave your computer unattended.

REMINDER: Backup your disk! Before using the VEGA utility diskette, we strongly recommend that you make a backup of the disk and store the original in a safe place.

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USING VEGA.COM

The VEGA.COM program is invoked with the keyword VEGA, followed by a set of commands. Below is a listing of each VEGA command with a description of what it does:

Command	Description
VEGA CGA:ON	Enable CGA emulation.
VEGA CGA:OFF	Disable CGA emulation.
VEGA MONO:ON	Enable HGC emulation.
VEGA MONO:OFF	Disable HGC emulation.
VEGA MONO:HALF	Enable HGC emulation (1 page graphics).
VEGA MONO:FULL	Enable HGC emulation (2 page graphics).
VEGA SAVE:ON	Enable Screen Saver function.
VEGA SAVE:[n]	Enable Screen Saver function to shut off video after "n" minutes of no keyboard activity.
VEGA SAVE:OFF	Disable Screen Saver function.

NOTE The VEGA.COM utility program is only needed for programs that make direct access to the CGA or HGC display adapter registers (or ports). You should run your program first, without the VEGA.COM program, to see if emulation is neccessary. With the exception of HGC compatible software, most of the newer programs written after the EGA was introduced do not require VEGA.COM for emulation since they do not make direct access to the CGA display adapter registers.

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Use the VEGA.COM commands with the following things in mind:

1. You have already installed the VEGA according to the instructions given in the previous section.

2. You have switch 5 of the VEGA switch block in the ON position (this permits the emulation mode).

3. You have a copy of the VEGA utility program VEGA.COM in your current drive or DOS path (see the DOS 2.XX manual for your particular PC for more information about paths).

4. You are issuing the commands at the DOS prompt or from within a batch file. The VEGA.COM examples explained in this manual are shown typed in at the DOS prompt.

5. You are using the correct monitor for the graphics adapter you intend to emulate. For example, if you have the VEGA connected to the IBM Color Display you should not issue a command to configure the VEGA to emulate the MDA, which requires the Monochrome Display.

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THE VEGA.COM COMMANDS

VEGA CGA:ON — This command will configure the VEGA to emulate the IBM Color Graphics Adapter (or CGA).

Example: **A>VEGA CGA:ON**
(then press <**RETURN**>)

VEGA CGA:OFF — If you wish to deactivate the CGA emulation mode, you can turn it off with the **VEGA CGA:OFF** command.

Example: **A>VEGA CGA:OFF**
(then press <**RETURN**>)

NOTE When the VEGA is configured to emulate the Color Graphics Adapter, it must be connected to either the IBM Color Display or the Enhanced Display (or compatible monitors). DO NOT use the VEGA in the Color Graphics Adapter emulation mode with a monochrome monitor.

VEGA MONO:ON — The VEGA will emulate the Hercules Graphics Card (HGC) when you issue the **VEGA MONO:ON** command.

Example: **A>VEGA MONO:ON**
(then press <**RETURN**>)

VEGA MONO:OFF — To deactivate the HGC configuration use the **VEGA MONO:OFF** command.

Example: **A>VEGA MONO:OFF**
(then press <**RETURN**>)

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NOTE When the VEGA is configured to emulate the Hercules Graphics Card it must be connected to the IBM Monochrome Display (or compatible monitor). DO NOT use the VEGA in the HGC emulation mode with a Color Display or Enhanced Display.

The VEGA can run software written to utilize the graphics capabilities of the Hercules Graphics Card in two different ways. First a quick explanation about the Hercules Graphics Card might help. The HGC has 64K of memory on board for graphics use, divided into two pages of graphics memory. The HGC can be configured to use the full amount of memory (that is, both graphic pages of memory, or 64K) or half that amount (one graphic page of memory 32K). There are two commands for these two HGC configurations, **VEGA MONO:FULL** and **VEGA MONO:HALF**.

The advantage of using **VEGA MONO:HALF** is that this configuration will permit an IBM compatible Color Graphics Adapter to co-exist with the VEGA (in Hercules emulation mode) in another slot. Monochrome output will be directed through the VEGA while color output will be directed through the co-resident Color Graphics Adapter. Using **VEGA MONO:FULL** is not permited when a co-resident IBM Color Graphics Adapter is installed.

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VEGA MONO:FULL To configure the VEGA to be fully Hercules Graphic Card compatible, without a co-resident IBM compatible Color Graphics Adapter use the **VEGA MONO:FULL** command.

Example: **A> VEGA MONO:FULL**
(then press <**RETURN**>)

NOTE While in this mode, the VEGA must be connected to an IBM Monochrome Display (or compatible monitor). DO NOT use a Color Display or an Enhanced Display while the VEGA is in the VEGA MONO:FULL mode. Furthermore, The VEGA MONO:FULL command will not permit you to have an IBM compatible color graphics card installed in your system with the VEGA.

VEGA MONO:HALF If you have a co-resident IBM compatible color graphics adapter in your system, you will need to use the **VEGA MONO:HALF** command.

Example: **A>VEGA MONO:HALF**
(then press <**RETURN**>)

NOTE While in the Hercules Graphics Card configuration, the VEGA must be connected to an IBM Monochrome Display (or compatible monitor). A co-resident IBM compatible Color Graphics Adapter must be attached to an appropriate IBM compatible RGB Color Display or Enhanced Color Display.

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If you plan on being away from your computer for a period of 5 minutes the VEGA.COM program will automatically "shut off" your screen display for you. VEGA.COM does this by monitoring the keyboard to see if any keys have been pressed. If none of the keys have been pressed over a specified time period (defaults to 5 minutes), VEGA.COM will shut off the screen. This feature will help extend the life of your monitor's screen and prevent images from being "burnt" into your screen while you are away from your computer.

VEGA SAVE:ON — You can enable this feature by using the **VEGA SAVE:ON** command.

Example — **A>VEGA SAVE:ON**
(then press <**RETURN**>)

VEGA SAVE:OFF — To deactivate the screen save feature, type **VEGA SAVE:OFF** at the DOS prompt.

Example — **A>VEGA SAVE:OFF**
(then press <**RETURN**>)

This may come in handy if the **VEGA SAVE** feature annoys you, or if you're using a mouse to draw with and you will not be pressing a key for some time.

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You can change the number of minutes you want VEGA.COM to wait before turning off the display by adding the number of minutes with the **VEGA SAVE** command. To use this command, type **VEGA SAVE** followed by the number of minutes at the DOS prompt.

Example **A>VEGA SAVE:n**
(then press <**RETURN**>)

NOTE "n" represents the number of minutes you want the VEGA to wait before it turns off the display.

For instance, the following example will turn the screen display off after 15 minutes:

Example **A>VEGA SAVE:15**
(then press <**RETURN**>)

Now the screen will not shut off until the computer remains unattended for 15 minutes.

NOTE Do not use the VEGA SAVE command with any other, stand alone, graphics card. It was made exclusively for use with the VEGA card. However, if the VEGA is being used with a co-resident graphics card, VEGA SAVE will not affect the other graphics card, or its video output. Video-7 will not be responsible for damage to your computer or monitor by incorrect use.

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MULTIPLE VEGA.COM COMMANDS ON ONE LINE:

One of the nice features of the VEGA.COM program is that it gives you the ability to have multiple VEGA.COM commands on one line. The following example will set the VEGA to emulate the IBM Color Graphics Adapter and, at the same time, set the SAVE feature for a 3 minute delay:

Example **A>VEGA CGA:ON SAVE:3**
(then press <RETURN>)

You can have up to 32 VEGA options on one command line.

NOTE VEGA.COM may not be compatible with certain software (such as debuggers and hardware probes). In these circumstances you may need to reboot your system and use the VEGA without any emulation.

BATCH FILES:

A "batch" file gives MS DOS (or PC DOS) the ability to run through a whole series of your commands automatically, as though you were typing them in, one by one, at the DOS prompt. A batch file uses the "BAT" extension (such as "**SAMPLE.BAT**") to differentiate it from other files.

There are two basic ways to create own batch file. First, you can use a text editor that will write standard ASCII text files (such as Wordstar in the Non-Document mode, or the DOS editor, EDLIN). Second, you can write a batch file directly from the DOS prompt using the DOS COPY command with the "CON" parameter.

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If you have never created a batch file, you may want to try the following example. The batch file presented here is written using the DOS COPY command. You can create this file with a text editor if you prefer.

Step 1 — You should use a disk that has a copy of VEGA.COM on it. At the DOS prompt type the following lines, exactly as shown, typing <RETURN> at the end of each line:

```
A>COPY CON: SAMPLE.BAT
CLS
VEGA SAVE:ON
```

Step 2 — Save this information to your disk by pressing Function Key 6 (or Ctrl-Z <RETURN>).

You should now be at the DOS prompt with a file on your disk called **SAMPLE.BAT**.

Step 3 — At the DOS prompt type:

```
A>SAMPLE
```
(then press <RETURN>)

Each line in the **SAMPLE.BAT** file will be invoked as follows:

Line 1 — **CLS**
(the DOS command for **CL**ear **S**creen)

Line 2 — **VEGA SAVE:ON**
(Turn on the screen save function)

Now, when you wish to clear your screen, and invoke the **VEGA SAVE ON** command, you merely have to type **SAMPLE** at the DOS prompt, and it will be done for you automatically.

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Once you know how to write a batch file you can create one that best suits your needs. Remember that just about anything you can type at the DOS prompt can be included as a line in your batch file.

AUTOEXEC.BAT FILES:

By creating an **AUTOEXEC.BAT** file you can have your computer system "configure" itself when you turn it on. The **AUTOEXEC.BAT** batch file will **AUTO**matically **EXE**Cute your commands upon booting up your system. Upon booting up, the COMMAND.COM file searches your boot disk for an **AUTOEXEC.BAT** file and executes the instructions in the file, one after the other, before you are returned to the DOS prompt.

The **AUTOEXEC.BAT** file is easy to create. Except for its name, it is exactly like the normal batch file.

For instance, if you are a LOTUS 1-2-3 user, and have already configured 1-2-3 to work with the IBM Color Graphics Adapter drivers, you can have your Lotus disk run VEGA.COM and setup the VEGA in the CGA mode, then invoke 1-2-3. An **AUTOEXEC.BAT** file can do this for you.

We will be using the DOS COPY command again to create an **AUTOEXEC.BAT** file. You can create this file with a text editor if you prefer.

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Step 1 Since this file will automatically boot up Lotus 1-2-3, you should be using your Lotus Boot disk, with a copy of VEGA.COM on it.

At the DOS prompt type the following lines, exactly as shown, pressing <**RETURN**> at the end of each line:

```
A>COPY CON: AUTOEXEC.BAT
DATE
TIME
VEGA CGA:ON
123
```

Step 2 Save this information to your disk by pressing Function Key 6 (or Ctrl-Z <**RETURN**>).

You should now be at the DOS prompt with a file on your disk called **AUTOEXEC.BAT**.

Now, when you boot this disk, the **AUTOEXEC.BAT** file we just created will be invoked as follows:

Line 1 **DATE**
(Enter a new system date)

Line 2 **TIME**
(Enter a new system time)

Line 3 **VEGA CGA:ON**
(Emulate the CGA)

Line 4 **123**
(Invoke Lotus 1-2-3)

You can find out more about Batch files in your DOS manual.

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MONITOR COMPATIBILITY

The VEGA will work with three different monitor types. This section will explain a little about each one of these monitors, and how the VEGA works with them. Although there are many compatible monitors, the information given here provides details of the monitors manufactured by IBM.

MONOCHROME DISPLAY

The IBM Monochrome Display is the most basic of the three monitors. It was designed to handle the IBM Monochrome Display Adapter (or MDA). When used with the MDA the Monochrome Display gives the user very sharp green text (256 different characters in 2 intensities) on a black background. Software written for this setup (the Monochrome Display used with the MDA) is text oriented, since the MDA does not generate any graphics, only text characters.

A couple of years ago Hercules Computer Technology introduced the Hercules Graphics Card (HGC), supporting all of the features of the MDA, plus high resolution, 720x348, 2 color, graphics on the Monochrome Display. Since it was introduced, the HGC has become the de facto standard for monochrome graphics in the IBM PC world. Because of this, most of the graphics oriented software packages now support the Hercules graphics standard on the Monochrome Display.

IBM did not support any form of graphics on the Monochrome Display (outside of text character graphics) until it introduced the IBM EGA. Using the Monochrome Display, the EGA supports 640 x 350 bit mapped graphics, in four colors. This graphics mode is not Hercules compatible.

The VEGA supports the features of each of these monochrome standards on the Monochrome Display.

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GENERAL DESCRIPTION: The Monochrome Display has a high persistence green phosphor screen (P39). When used with the MDA or HGC it displays 80 characters horizontally, by 25 characters deep. In this configuration, characters, are defined in a 9 x 14 pixel matrix, with 350 lines of vertical resolution and 720 lines of horizontal resolution. The maximum bandwidth is 16.257 MHz, with the screen refresh at 50 Hz. The Monochrome Display is TTL compatible at a frequency of 18.432 KHz.

SOFTWARE COMPATIBILITY: Almost all of the software written for the IBM PC supports the most basic text output of the Monochrome Display when used with the MDA. When the VEGA is not in emulation mode, it will support the new IBM EGA monochrome graphics mode, but remember, the VEGA will not generate graphics while it emulates the MDA since the MDA does not support graphics. Since the VEGA can emulate the HGC, the VEGA will work with any software packages supporting HGC graphics on the Monochrome Display.

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COLOR DISPLAY

The IBM Color Display is an RGB monitor, capable of displaying up to 16 different colors. RGB stands for the digital outputs of RED, GREEN and BLUE. The standard IBM Color Display actually has four distinct digital outputs, Red, Green, Blue and Intensity. Some monitors which do not have a separate digital Intensity output may still work without making use of the separate Intensity signal, but they will only be capable of displaying 8 distinct colors, not 16. The Intensity signal is needed to enable an RGB monitor to display 16 colors.

The Color Display was designed to work with the Color Graphics Adapter (or CGA). Much of the graphics oriented software written for the IBM over the past several years was written to the CGA standards. The CGA can display text at both 80 and 40 column widths, but the text appears a little grainy, and is not usually considered to be very sharp.

Since it was introduced, the basic characteristics of the Color Display have been copied by just about everyone in the monitor industry, making it easy to buy a good quality RGB monitor that conforms to the IBM standards.

GENERAL DESCRIPTION: The IBM Color Display has a high contrast, black screen and can display up to 16 colors when used with the VEGA configured to use the Color Display. In this configuration, the Color Display can handle up to 80 characters horizontally, by 25 characters vertically in an 8x8 pixel matrix, supporting the entire IBM character set. The maximum bandwidth is 14.318 MHz, with the screen refresh at 60 Hz supporting 640 horizontal by 200 vertical lines of resolution. The Color Display is TTL compatible at a frequency of 15.750 KHz.

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SOFTWARE COMPATIBILITY: Almost all of the software written for the IBM PC supports the CGA and Color Display. When used with the Color Display, the VEGA will support all of the CGA software characteristics, as well as the newer Color Display compatible EGA modes, including 320 x 200 and 640 x 200, 16 color graphics.

ENHANCED COLOR DISPLAY

The IBM Enhanced Color Display is capable of operating in two distinct modes with the VEGA. The Enhanced Color Display has a dual frequency feature which does all of the switching between Mode 1 and Mode 2 automatically. When the Enhanced Color Display is in Mode 1, it has the same characteristics as the Color Display, and can display all of the CGA modes. When the Enhanced Color Display is used with the VEGA and it switches to Mode 2 it can generate very high resolution graphics and text, including up to 43 lines of text (instead of the usual 25) and 16 different colors (from a palette of 64) in three different graphics modes.

Most of the monitor manufacturers have already introduced monitors which are compatible with Enhanced Color Display. Some of these monitors offer sharper displays, with more features, for less money.

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GENERAL DESCRIPTION: The IBM Enhanced Color Display has a high contrast, 13 inch, black screen. It can operate in two different modes which it automatically selects by checking the polarity of the Vertical Sync signal. The Enhanced Color Display can display up to 16 colors when used with the VEGA configured as a CGA. In this configuration, the Enhanced Color Display can handle up to 80 characters horizontally, by 25 characters vertically in an 8 x 8 pixel matrix, supporting the entire IBM character set. When used with the VEGA in EGA mode, the Enhanced Color Display supports all of the new EGA color graphics and text modes (including 80 characters horizontally x 25 lines vertically and 80 characters horizontally x 43 lines vertically), and supports up to 16 colors (from a palette of 64) with 640 horizontal by 350 vertical lines of resolution. Screen refresh is at 60 Hz. Bandwidth is 16.257 MHz. In Mode 1 the Horizontal Scan rate is 15.750 KHz. In Mode 2 the Horizontal Scan rate is 21.850 KHz.

SOFTWARE COMPATIBILITY: The Enhanced Color Display is a very versatile monitor. It supports software written for the IBM CGA (by switching itself into Mode 1 operation and emulating the Color Display), and software written to conform to the newer EGA graphics and text modes. The Enhanced Color Display does not support software written for the monochrome graphics modes, both Hercules and EGA. Your dealer will be able to help you choose software that supports the Enhanced Color Display and EGA graphics and text modes.

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SELECTING A MONITOR:
(General Information)

Because the VEGA supports three different monitor types, there are many different monitors available to the VEGA user. However, along with this variety of monitors comes a variety of prices and quality. The cliche', "You get what you pay for," applies here. Or, more simply, the better quality monitors will cost you more money. Here are a few guidelines to follow when purchasing a good quality monitor, whether looking for a Monochrome Display, Color Display, or the Enhanced Color Display:

1. **DO YOUR HOMEWORK**: Check all of the available monitor brands in your price range. Find the one that has the most capability for the money. Read product reviews in the leading IBM PC oriented computer magazines to find out more about the monitors' features.

2. **YOUR EYES DON'T LIE**: Look at the monitor before you buy it. Ask your dealer to give you a demonstration of the monitor using various types of software which you may want to use yourself. Look at both text and graphics on the monitor display.

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3. CHECK THE CABLE COMPATIBILITY: The VEGA uses the IBM standard 9 pin connector (usually referred to as a DB-9, or "D-shell" connector). Even though the DB-9 cable connector is used on more IBM PC type monitors than any other type of connector, the monitor you are interested in may not have a DB-9 pin connector on its cable. If this is the case you should ask your dealer about the availability of a compatible DB-9 cable for the monitor. If a cable is not readily available, a cable company or local technician may be able to make a cable to interface the VEGA to your monitor (ask your dealer about this), but it may cost extra to do this. You can defray this cost by checking before you buy.

4. COLOR DISPLAY (RGB)/COMPOSITE COMBINATION MONITORS: Many people are purchasing monitors that provide both RGB capability (for CGA compatibility) and composite interfaces (for color television) in the same unit. Generally these monitors have many outstanding qualities, but, before you buy, check its RGB capabilities using the criteria you would use to check a dedicated RGB monitor. We have found that some of these units have a good quality "composite" picture, but a poor quality RGB picture.

5. COMPOSITE MONITORS: The VEGA will not support composite monitors without a "feature adapter." The RCA plugs on the VEGA will support feature adapters designed for use with a composite monitor.

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6. **CAVEAT EMPTOR:** There are many monitor manufacturers in the business of producing high quality, fully compatible, monitors to use with the IBM PC, or compatible computer. Don't let a salesperson rush you into buying something you are not completely satisfied with. Although it doesn't happen often, you may be pressured into buying a monitor brand that isn't selling well just so the store can get rid of them for a more popular brand. Be knowledgeable about your purchase.

7. **THINKING OF CALLING OUR PRODUCT SUPPORT DEPARTMENT?** We cannot recommend any monitor brands since we realize that each person has their own tastes. However, we can send you a list of current compatible monitors as well help you with your technical support questions, but we cannot select a monitor for you.

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CABLE COMPATIBILITY AND PINOUT INFORMATION

The VEGA comes with a 9 pin cable connector, commonly referred to as a DB-9, or DE-9, connector. Your monitor cable should have a cable with a DB-9 input. Each of the nine pins have different functions depending upon which type of display you are emulating with the VEGA. The following tables will list the pin configurations for each IBM display type.

Monochrome Display Pin Outs:

1. Ground	4. N/A	7. Video
2. Ground	5. N/A	8. Horizontal Sync (+)
3. N/A	6. Intensity	9. Vertical Sync (+)

Color Display Pin Outs:

1. Ground	4. Green	7. N/A
2. Ground	5. Blue	8. Horizontal Sync (+)
3. Red	6. Intensity	9. Vertical Sync (+)

Enhanced Color Display Pin Outs (64 color/350 line mode):

1. Ground	4. Green	7. blue
2. red	5. Blue	8. Horizontal Sync (+)
3. Red	6. green	9. Vertical Sync (–)

Note: **Red**, **Green**, and **Blue** are the most significant bits, while **red**, **green**, and **blue** are the least significant bits.

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NOTE The Enhanced Color Display has two separate modes of operation. Both of these modes are "transparent" to the user since the Enhanced Color Display switches between them automatically. The pinouts for Mode 1 are identical to the Color Display pinouts, and, hence, are not re-listed. If you are making a cable for the Enhanced Color Display use the pinout information described for Mode 2.

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APPENDIX A: VEGA SWITCHES AND CONNECTORS

The VEGA has several switch settings that enable you to run the VEGA in different configurations. This section will explain the switch settings available to you. Part one explains the VEGA switch block settings. Part two will explain the VEGA toggle switch and jumper block settings.

VEGA SWITCH BLOCK SETTINGS: The VEGA Switch Block is located on the VEGA PC board next to the installation bracket. They are positioned in such a way that you can reach these switches from the rear of your computer after you have installed the VEGA.

There are three basic ways to install the VEGA in your system:

1. Alone, without any other display adapters co-resident.

2. With a Monochrome Display Adapter co-resident, and the VEGA configured as a Color Graphics Adapter.

3. With a Color Graphics Adapter co-resident and the VEGA configured as a Monochrome Display Adapter.

When the VEGA is installed with a co-resident display adapter you must specify which display adapter is the "primary" card, and which is the "secondary" card. The adapter you specify as primary will be the prime video output source upon bootup. Output will be directed through the primary card. The secondary display adapter will be dormant until you activate it using the DOS MODE command.

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For instance, if you have the VEGA setup to be the primary display adapter, and a Monochrome Display Adapter (MDA) setup as the secondary adapter, the VEGA will output the DOS prompt to its display when you boot up your system with a DOS disk. The MDA will not display the DOS prompt. Any DOS commands issued will be displayed from the VEGA's display output. You can change your primary video output source by using the DOS MODE command (the MODE.COM program must be on your default disk).

In this situation, to use the MDA as your primary output, at the DOS prompt, type:

A>MODE MONO (then press <**RETURN**>)

The **MONO** parameter will set the output to the MONOchrome Display.

To reverse the procedure, and direct video output through the VEGA, use the MODE command again: At the DOS prompt, type:

A>MODE CO80 (then press <**RETURN**>).

The CO80 parameter will set the output to the **CO**lor Display in **80** columns.

You may want to take a look at the MODE command in your DOS manual.

Since the VEGA can emulate different display adapters, care must be taken when you specify the primary and secondary display adapters in your system. An easy rule to follow is: "The IBM PC will not allow two similar display adapters in the system at the same time." That is, you cannot have the VEGA emulate an MDA with a co-resident MDA in your system, nor can you have the VEGA emulate the CGA with a co-resident CGA in your system. Furthermore, the VEGA cannot co-reside with another VEGA or EGA in the system.

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SETTING THE SWITCHES:

Switches 1 through 4 are used to set the VEGA in these basic configurations. The switches are set either to ON or to OFF. If the switch is in the down position it is ON. If it is set in the up position it is OFF.

Find your configuration in the following tables, and set your VEGA switches accordingly:

VEGA ALONE

VEGA Configured as	Display Used	VEGA Switches Sw1	Sw2	Sw3	Sw4
MDA	MD	Off	Off	On	Off
CGA (40x25)	CD/ED	On	Off	Off	On
CGA (80x25)	CD/ED	Off	Off	Off	On
EGA	ED (normal)	On	On	On	Off
EGA	ED (enhanced)	Off	On	On	Off

VEGA With MDA Co-Resident

Primary adapter: **VEGA**
Secondary adapter: MDA

VEGA Configured as	Display Used	VEGA Switches Sw1	Sw2	Sw3	Sw4
CGA (40x25)	CD/ED	On	Off	Off	On
CGA (80x25)	CD/ED	Off	Off	Off	On
EGA	ED (normal)	On	On	On	Off
EGA	ED (enhanced)	Off	On	On	Off

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Primary adapter: **MDA**
Secondary adapter: VEGA

VEGA Configured as	Display Used	VEGA Switches Sw1	Sw2	Sw3	Sw4
CGA (40x25)	CD/ED	On	On	On	On
CGA (80x25)	CD/ED	Off	On	On	On
EGA	ED (normal)	On	Off	On	On
EGA	ED (enhanced)	Off	Off	On	On

VEGA With CGA Co-Resident

Primary adapter: **VEGA** (with Monochrome Display)
Secondary adapter: CGA

CGA Mode	VEGA Switches Sw1	Sw2	Sw3	Sw4
40 x 25	On	Off	On	Off
80 x 25	Off	Off	On	Off

Primary adapter: **CGA**
Secondary adapter: VEGA (with Monochrome Display)

CGA Mode	VEGA Switches Sw1	Sw2	Sw3	Sw4
40 x 25	On	On	Off	On
80 x 25	Off	On	Off	Off

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VEGA EMULATION MODE

Switch 5 on the VEGA Switch Block enables or disables the VEGA Emulation Mode.

When switched to the OFF position, the VEGA becomes fully compatible with the IBM EGA, and does not permit CGA or HGC emulation. Like the IBM EGA, the VEGA will be compatible with most of the IBM software supporting the CGA and MDA, but it will not let you run Hercules Compatible software or some Color Graphics Adapter software.

When switched to ON position the VEGA Emulation mode is enabled. The VEGA Emulation mode permits you to use the VEGA Utility Disk to configure the VEGA to be fully compatible with CGA and HGC software.

THE VEGA TOGGLE SWITCH

The VEGA Toggle Switch is located next to the VEGA Switch Block and is easily accessable from the rear of your computer after installation.

The Toggle Switch tells the VEGA what kind of monitor you are using. When the Toggle is switched to the left (as you look at the switch from the rear of the computer) the VEGA becomes fully configured to work with the Enhanced Color Display. When the toggle is switched to the right (as you look at the switch from the rear of the computer) the VEGA becomes fully configured to work with either the Color Display or the Monochrome Display.

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THE VEGA SLOT-8 JUMPER BLOCK

If you are installing the VEGA in slot 8 of an IBM PC/XT, you will need to change the jumper pin on the VEGA "Slot-8" jumper block. See Appendix C for the location of the jumper block. The jumper pin must be positioned on pins 1 and 2 to enable the slot-8 option. Positioning the jumper pin on pins 2 and 3 (default position) disables the slot-8 option.

THE VEGA 2XX/3XX JUMPER BLOCK

The VEGA supports the IBM EGA 3XX/2XX address port jumper block. See Appendix C for the location of the jumper block. The jumper pin should be positioned on pins 1 and 2, and should remain in this 3XX position at all times. The jumper pin positioned on pins 2 and 3 configure the VEGA for the 2XX address port.

THE VEGA LIGHT PEN PORT

The VEGA supports the IBM EGA light pen port. The VEGA Light Pen Port is operational and compatible with the IBM EGA light pen port. See Appendic C for the location of the light pen port.

RCA VIDEO JACKS AND THE FEATURE CONNECTOR

The VEGA Feature Connector and the RCA Video Jacks are compatible with those found on the IBM EGA. The 32 pin Feature Connector is located along the top of the VEGA and supports add-on feature adapters made to enhance the VEGA or IBM EGA. The two RCA Video Jacks are connected to the Feature Connector, and will support video output from future feature adapters.

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VEGA TROUBLE SHOOTING:

If you are experiencing difficulty with the VEGA, please follow these steps:

1. Make sure that the VEGA is seated firmly in its expansion slot, and that it is not touching against other cards in your system.

2. Check your monitor cable to insure that it is properly connected to the VEGA and that it has the proper "pin-out" configuration.

3. Make sure that your computer is either an IBM PC or a computer which is 100% IBM PC compatible.

4. Check your computer's switch settings, as well as those on the VEGA to insure that all settings are correct for the type of configuration you are operating.

5. Check your software. The VEGA can emulate 4 different display adapters. Be sure you are using the correct type of software for the display adapter the VEGA is emulating.

6. Check your monitor. The VEGA can work with three different monitor types. Be sure you have the VEGA configured for the monitor you are using. See the section on Monitors for more information.

7. Make sure that you are using the correct VEGA.COM commands when in the emulation mode.

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VIDEO-7 PRODUCT SUPPORT: Our Product Support department will be glad to assist you with questions you may have concerning the VEGA. Please feel free to call us, Monday through Friday, 8:00 am to 5:00 pm, Pacific Time Zone, at 408-943-0101. To help us, try to have the following information handy when you call us:

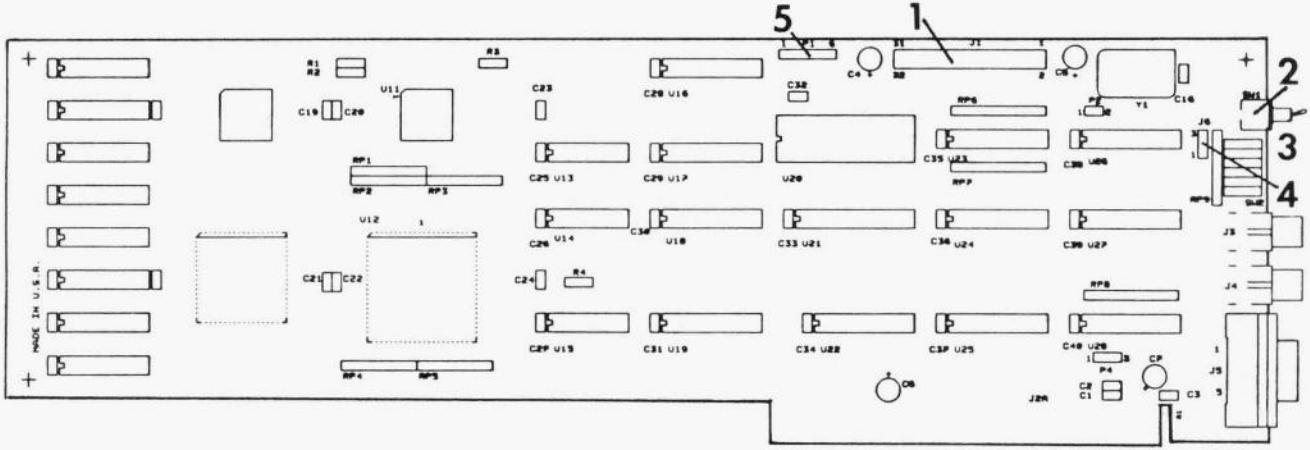
1. SYSTEM DESCRIPTION: What kind of PC are you using? What kind of peripheral cards are you using? How much RAM is your system configured for? What kind of monitor you are using?

2. SOFTWARE: If you suspect a problem with software and VEGA compatibility, what software package are you using the VEGA with? What display adapters does the software support?

3. THE DETAILS OF WHAT YOU WERE DOING WHEN YOU NOTICED THE PROBLEM: Were you in the middle of a program when a problem occurred? Did the problem occur when you were turning on a device, like your printer for instance?

RETURN MATERIAL AUTHORIZATION: If you believe your product is defective, or in need of repair please call our Product Support department and receive a Return Material Authorization (RMA) number BEFORE you decide to ship it to us. If your product is still under Warranty we will require that you send a copy of your sales slip with the product. Obtaining the RMA number before you ship it to us helps us keep track of your product easier.

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You can find the locations of the Long Slot VEGA connectors and switches by using diagram on this page.

The locations are numbered as follows:

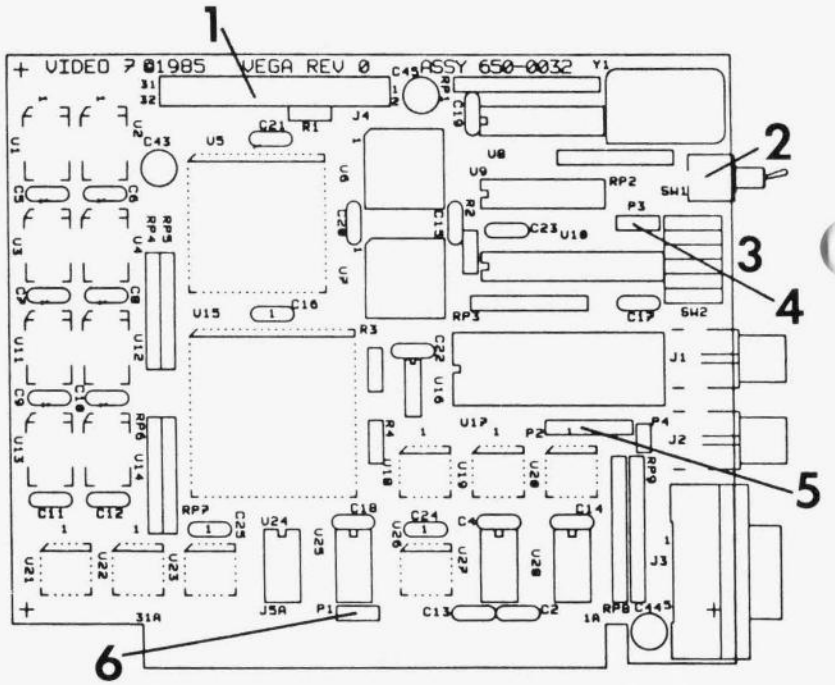
1. FEATURE CONNECTOR
2. TOGGLE SWITCH
3. SWITCH BLOCK
4. 2XX/3XX JUMPER BLOCK
5. LIGHT PEN PORT

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You can find the locations of the Short Card VEGA connectors and switches by using diagram on this page.

The locations are numbered as follows:

1. FEATURE CONNECTOR
2. TOGGLE SWITCH
3. SWITCH BLOCK
4. 2XX/3XX JUMPER BLOCK
5. LIGHT PEN PORT
6. SLOT 8 JUMPER BLOCK



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In order to obtain warranty performance, contact our Product Support Department for a Return Material Authorization (RMA) number, return the product with the RMA written legibly on the exterior of the package, transportation charges prepaid, to Video-7. Attach a copy of proof of date of retail purchase (such as bill of sale) and a description of the problem.

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VEGA Diagnostics

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DIAGNOSTICS MANUAL

FIRST EDITION (November, 1985)

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Introduction

The Diagnostics program on your Utility Disk will help you spot any problem that may be occuring with your display adapter.

DIAG.COM

After invoking the Diagnostics program, you will proceed through a series of steps designed to check each function of your adapter. Each step is outlined in this section. The program may be run from the DOS prompt by typing: **DIAG** (then press <**RETURN**>).

The Diagnostics program will display the amount of video memory available on your display adapter (this should be 256K), along with your primary and secondary graphics adapters and monitor configuration on the screen. If the information shown is incorrect, run through the Problem Checklist (page 2), then run the Diagnostics program again.

If the information shown is correct you can continue with the Diagnostics program.

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Introduction

This manual is written in three parts, each part dealing with the three standard IBM monitors: IBM Monochrome Display, IBM Color Display, and the IBM Enhanced Color Display (or compatible monitors).

Follow the Diagnostics for your particular monitor.

Problem Checklist

If you think the Diagnostics program has spotted a problem, go through the checklist:

1. Power off the computer. You may be setting switches on the display adapter and inside your computer.

2. Check your adapter switch settings. There are a variety of ways to configure your display adapter. The Diagnostics program may be diagnosing a feature based upon what the switches are setup for. For display adapter Switch Information, see Appendix A of your User's Manual.

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3. Check your computer's switch settings. The Installation instructions in your User's Manual give details as to which switches to set for your particular PC.

4. Check your connections. Be sure your adapter is seated firmly in its expansion slot. Make sure you are using the right cable, and that it is connected properly.

5. Run the Diagnostics program again. If you are still experiencing problems, there may be something wrong with your display adapter. Give our Technical Support Department a call for more information and assistance. See Appendix B of your User's Manual for information concerning Technical Support.

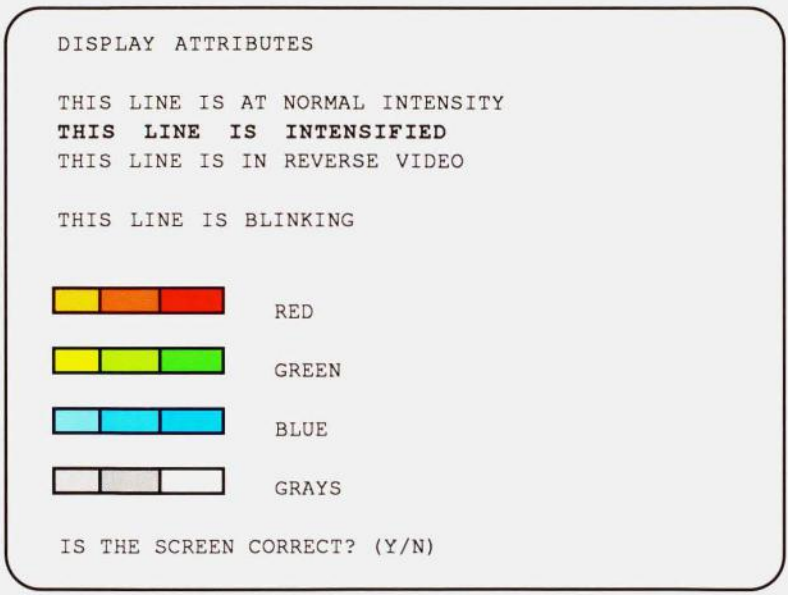
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Enhanced Color Display Diagnostics

IBM Enhanced Color Display
(or compatible monitors)

Step 1 **Display Attributes, Screen 1**

Does your screen appear similar to the one below? Are the colors correct? (There should be three different shades of each color.)



YES: Continue to next step.

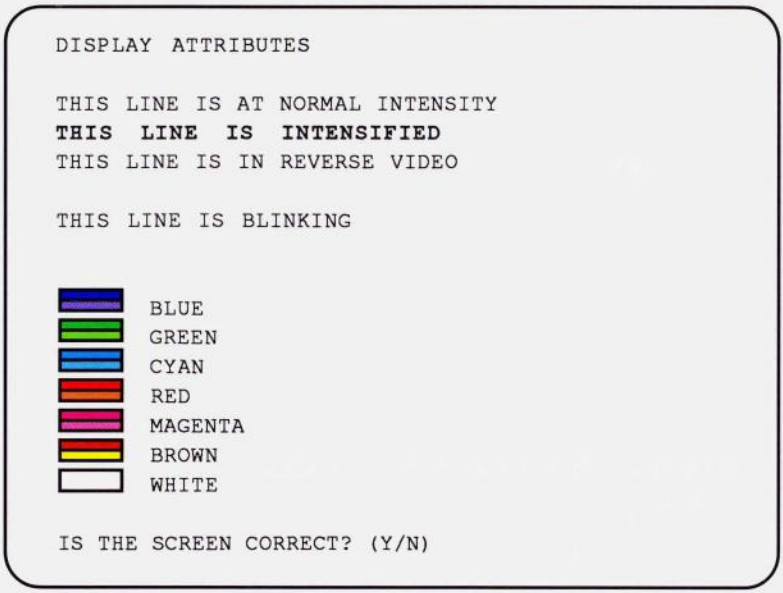
NO: Go through the steps in the Problem Checklist on page 2.

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Enhanced Color Display Diagnostics

Step 2 **Display Attributes, Screen 2**

Does your screen appear similar to the one below? Are the colors correct? (There should be two different shades of each color.)



YES: Continue to next step.

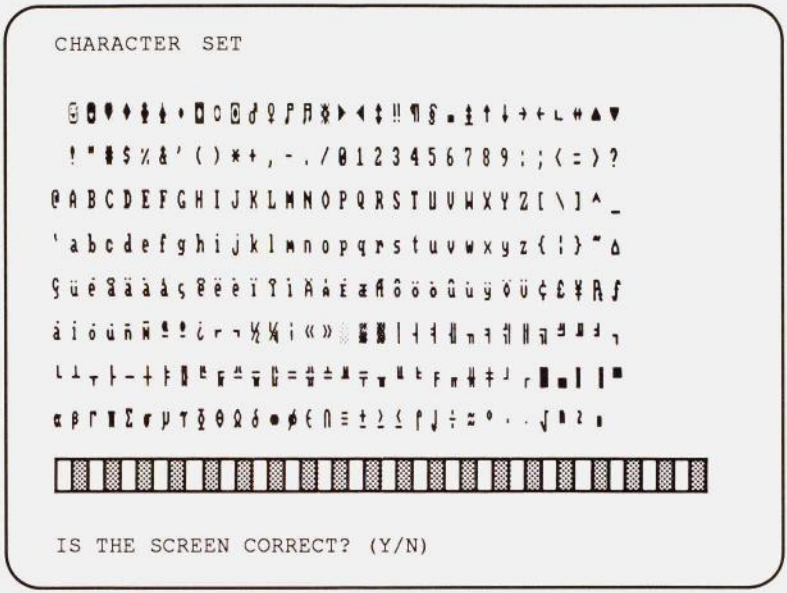
NO: Go through the steps in the Problem Checklist on page 2.

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Enhanced Color Display Diagnostics

Step 3 **IBM Character Set, Screen 1**

Does your screen appear similar to the one below?



YES: Continue to next step.

NO: Go through the steps in the Problem Checklist on page 2.

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Enhanced Color Display Diagnostics

Step 4 **IBM Character Set, Screen 2**
80 x 25 Display

Does your screen appear similar to the one below?

```
80X25  DISPLAY

 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOP
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQ
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQR
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRS
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRST
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTU
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUV
)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVW
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWX
+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXY
,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ
-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[

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

YES: Continue to next step.

NO: Go through the steps in the Problem Checklist on page 2.

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Enhanced Color Display Diagnostics

Step 5 **IBM Character Set, Screen 3**
40 x 25 Display

Does your screen appear similar to the one below?

```
40X25 DISPLAY

 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEF
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFG
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGH
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHI
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJ
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJK
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKL
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLM
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOP
+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQ

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

YES: Continue to next step.

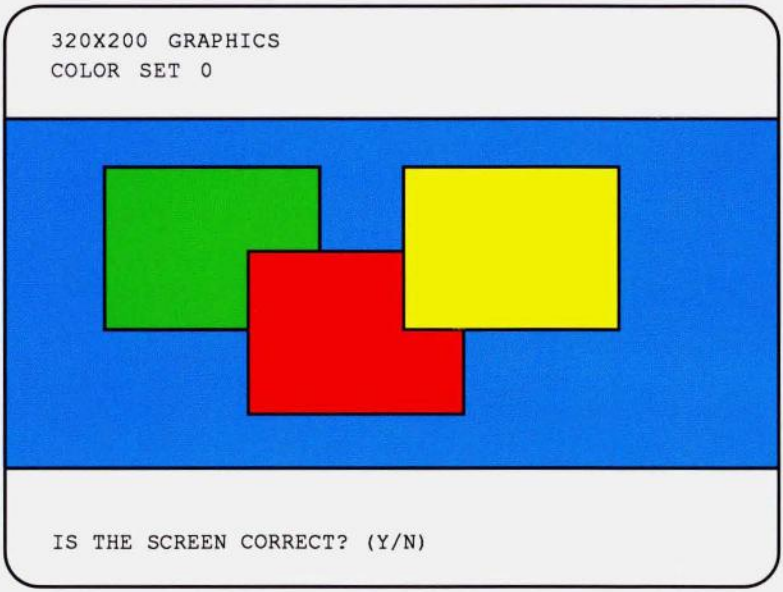
NO: Go through the steps in the Problem Checklist on page 2.

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Enhanced Color Display Diagnostics

Step 6 **Graphics, Screen 1, 320 x 200**
Color Set 0

Does your screen appear similar to the one below?



YES: Continue to next step.

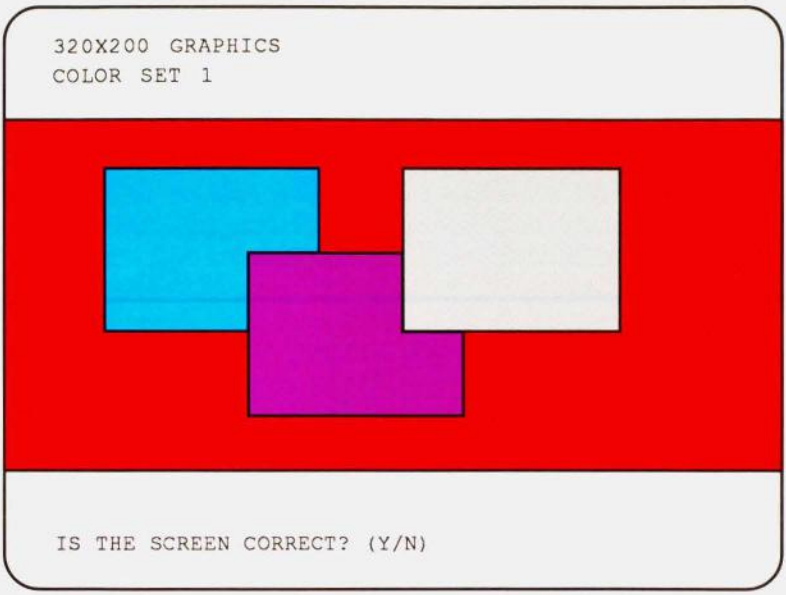
NO: Go through the steps in the Problem Checklist on page 2.

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Enhanced Color Display Diagnostics

Step 7 **Graphics, Screen 2, 320 x 200**
Color Set 1

Does your screen appear similar to the one below?



YES: Continue to next step.

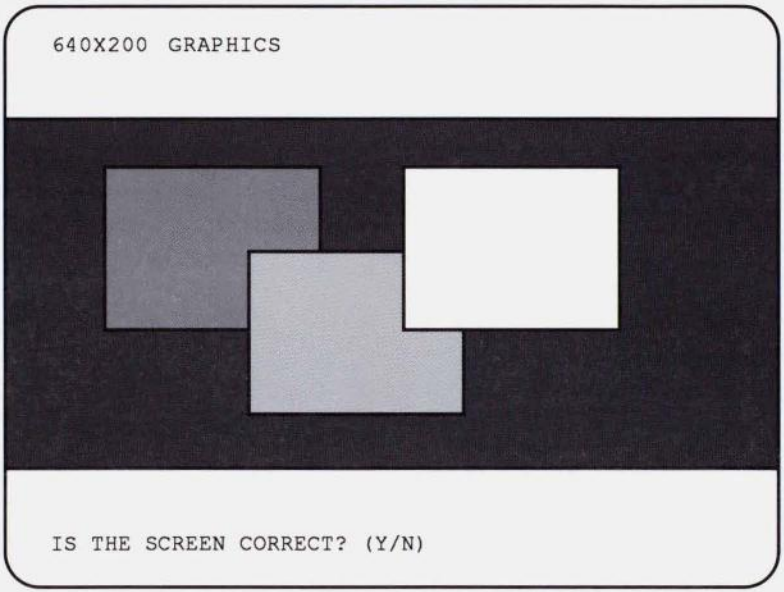
NO: Go through the steps in the Problem Checklist on page 2.

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Enhanced Color Display Diagnostics

Step 8 **Graphics, Screen 3, 640 x 200**

Does your screen appear similar to the one below?



YES: Continue to next step.

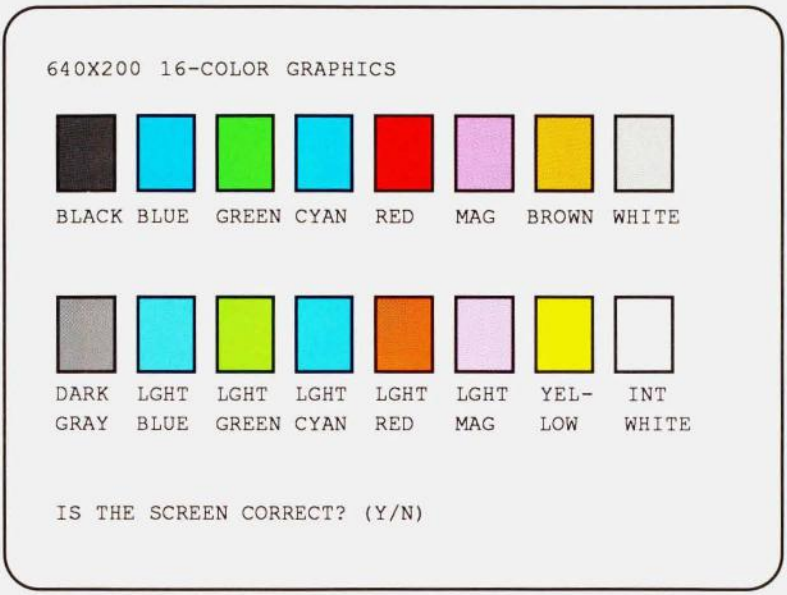
NO: Go through the steps in the Problem Checklist on page 2.

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Enhanced Color Display Diagnostics

Step 9 **Graphics, Screen 4, 640 x 200 16 Color**

Does your screen appear similar to the one below?



YES: Continue to next step.

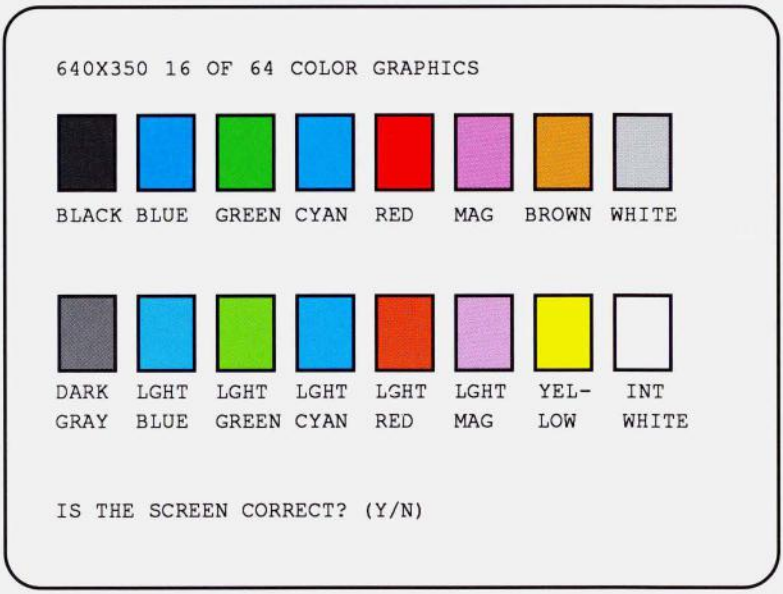
NO: Go through the steps in the Problem Checklist on page 2.

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Enhanced Color Display Diagnostics

Step 10 **Graphics, Screen 5, 640 x 350 16 Color**

Does your screen appear similar to the one below?



YES: Continue to next step.

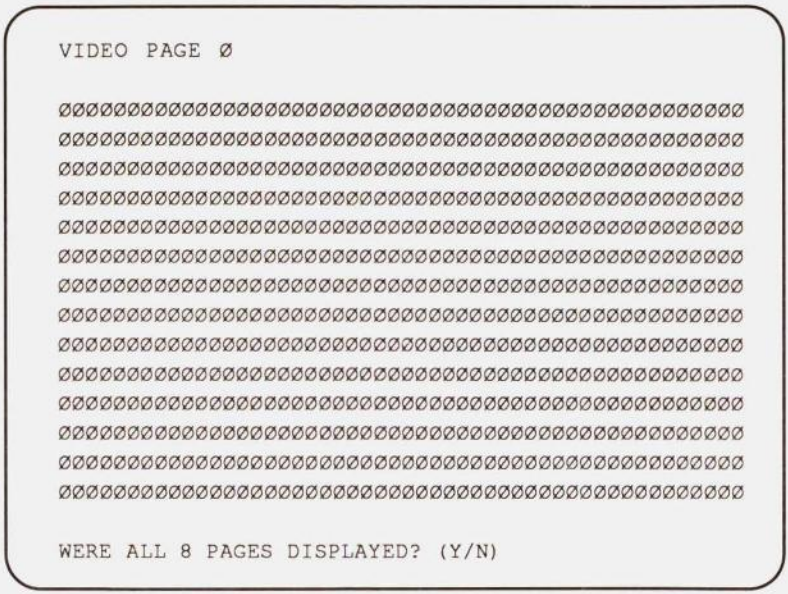
NO: Go through the steps in the Problem Checklist on page 2.

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Enhanced Color Display Diagnostics

Step 11 **Video Pages 0-7**

Press any key to to flip through all 8 video pages. Continue until "VIDEO PAGE 0" appears on your screen. Did all 8 pages appear similar to the one below?



YES: This ends the Diagnostics for the IBM Enhanced Color Display (or compatible monitor).

NO: Go through the steps in the Problem Checklist on page 2.

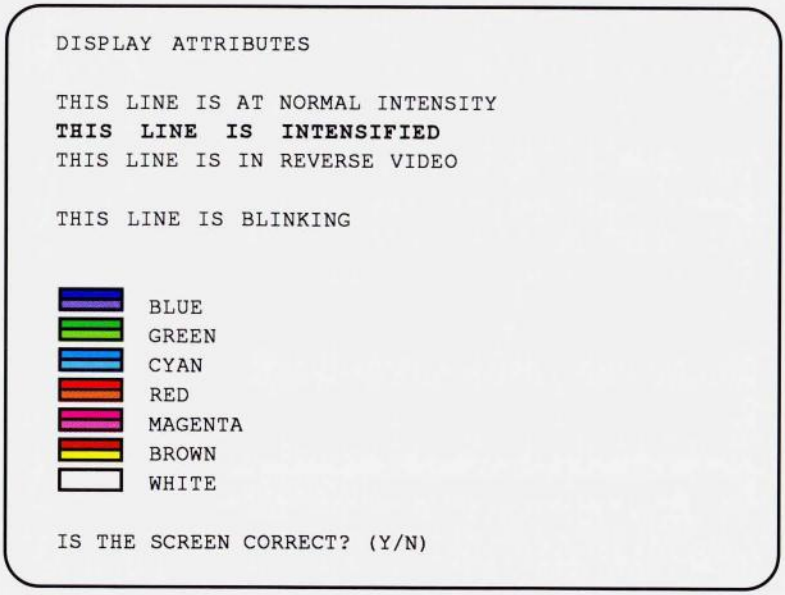
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Color Display Diagnostics

IBM Color Display
(or compatible monitors)

Step 1 **Display Attributes, Screen 1**

Does your screen appear similar to the one below? Are the colors correct? (There should be two different shades of each color.)



YES: Continue to next step.

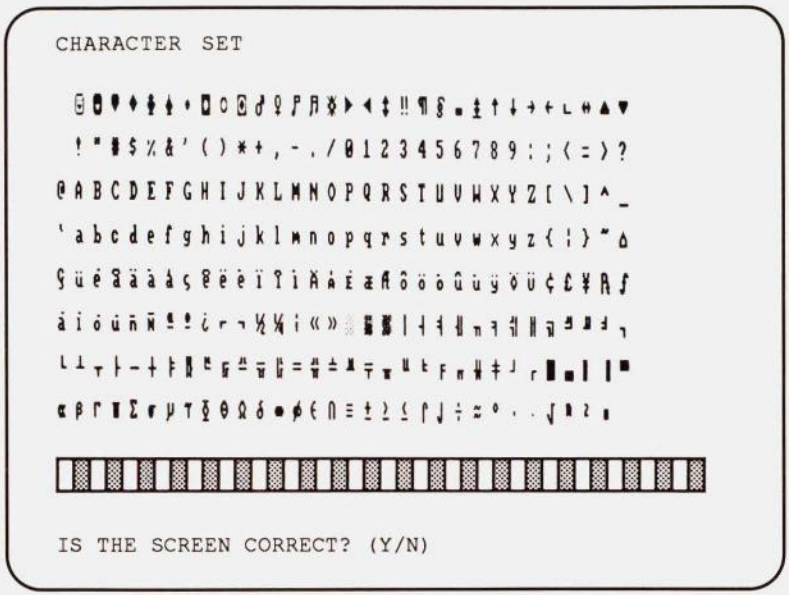
NO: Go through the steps in the Problem Checklist on page 2.

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Color Display Diagnostics

Step 2 **IBM Character Set, Screen 1**

Does your screen appear similar to the one below?



YES: Continue to next step.

NO: Go through the steps in the Problem Checklist on page 2.

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Color Display Diagnostics

Step 3 **IBM Character Set, Screen 2**
80 x 25 Display

Does your screen appear similar to the one below?

```
80X25  DISPLAY

 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOP
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQ
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQR
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRS
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRST
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTU
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUV
)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVW
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWX
+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXY
,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ
-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[

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

YES: Continue to next step.

NO: Go through the steps in the Problem Checklist on page 2.

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Step 4 **IBM Character Set, Screen 3**
40 x 25 Display

Does your screen appear similar to the one below?

```
40X25 DISPLAY

 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEF
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFG
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGH
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHI
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJ
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJK
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKL
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLM
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOP
+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQ

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

YES: Continue to next step.

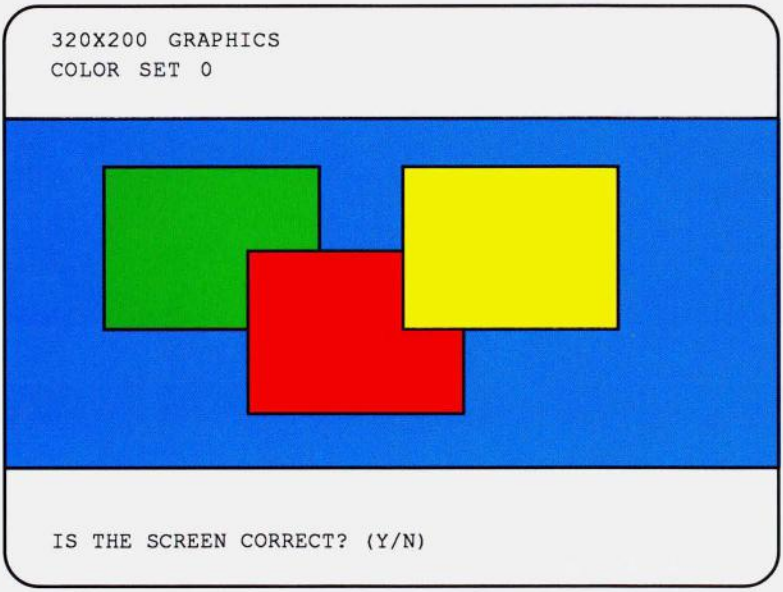
NO: Go through the steps in the Problem Checklist on page 2.

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Color Display Diagnostics

Step 5 **Graphics, Screen 1, 320 x 200**
Color Set 0

Does your screen appear similar to the one below?



YES: Continue to next step.

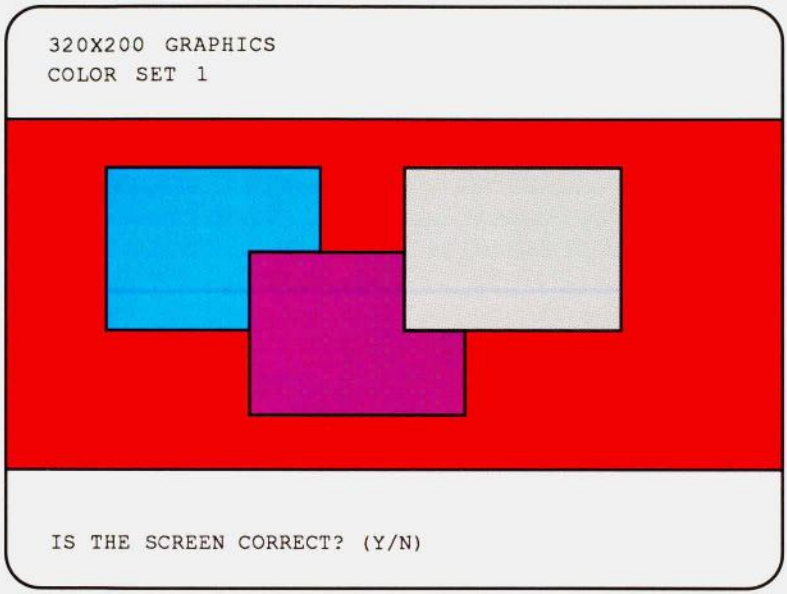
NO: Go through the steps in the Problem Checklist on page 2.

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Color Display Diagnostics

Step 6 **Graphics, Screen 2, 320 x 200**
Color Set 1

Does your screen appear similar to the one below?



YES: Continue to next step.

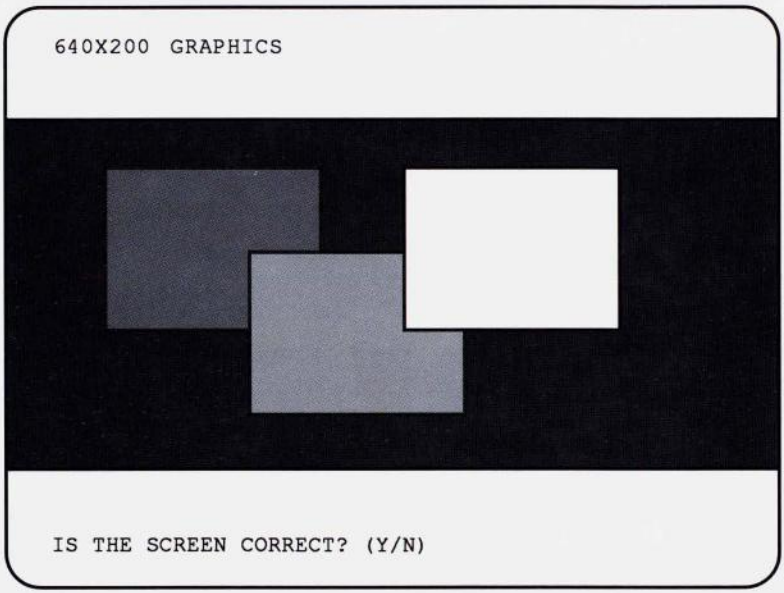
NO: Go through the steps in the Problem Checklist on page 2.

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Color Display Diagnostics

Step 7 **Graphics, Screen 3, 640 x 200**

Does your screen appear similar to the one below?



YES: Continue to next step.

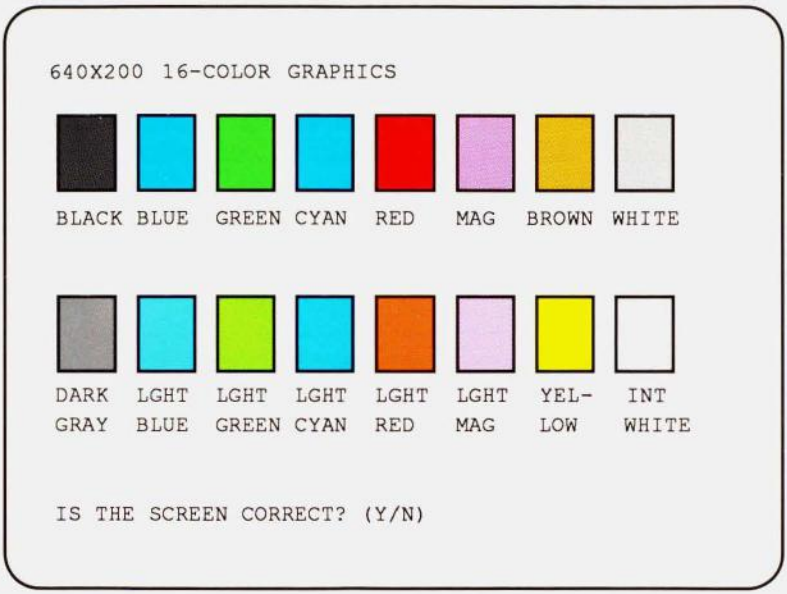
NO: Go through the steps in the Problem Checklist on page 2.

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Color Display Diagnostics

Step 8 **Graphics, Screen 4, 640 x 200 16 Color**

Does your screen appear similar to the one below?



YES: Continue to next step.

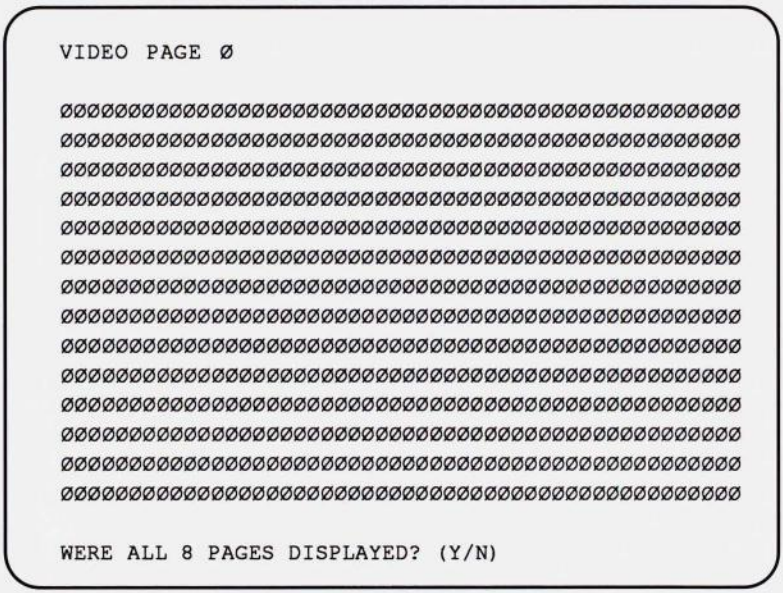
NO: Go through the steps in the Problem Checklist on page 2.

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Color Display Diagnostics

Step 11 **Video Pages 0-7**

Press any key to to flip through all 8 video pages. Continue until "VIDEO PAGE 0" appears on your screen. Did all 8 pages appear similar to the one below?



YES: This ends theDiagnostics for the IBM Color Display (or compatible monitor).

NO: Go through the steps in the Problem Checklist on page 2.

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Monochrome Display Diagnostics

IBM Monochrome Display (or compatible monitors)

Step 1 **Display Attributes, Screen 1**

Does your screen appear similar to the one below?

```
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: Continue to next step.

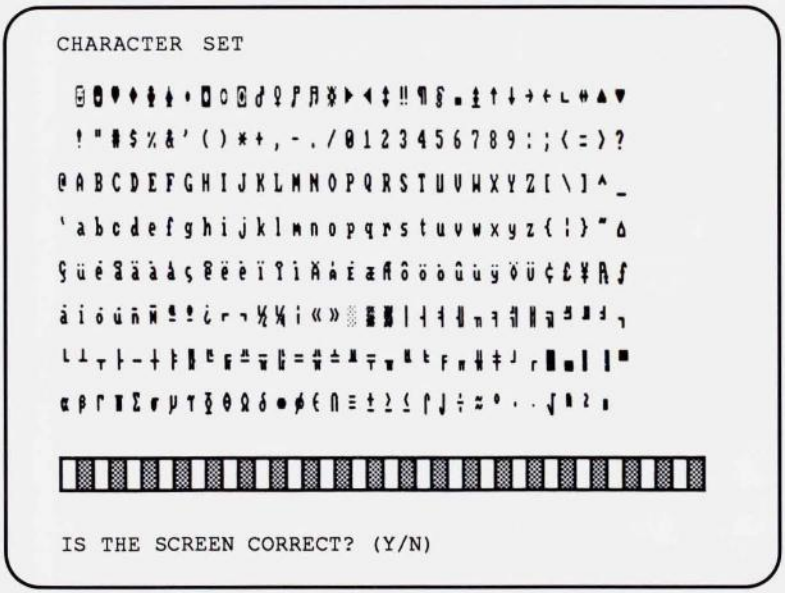
NO: Go through the steps in the Problem Checklist on page 2.

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Monochrome Display Diagnostics

Step 2 **IBM Character Set, Screen 1**

Does your screen appear similar to the one below?



YES: Continue to next step.

NO: Go through the steps in the Problem Checklist on page 2.

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Monochrome Display Diagnostics

Step 3 **IBM Character Set, Screen 2**
80 x 25 Display

Does your screen appear similar to the one below?

```
80X25 DISPLAY

 !"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOP
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQ
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQR
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRS
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRST
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTU
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUV
)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVW
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWX
+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXY
,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ
-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[

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

YES: Continue to next step.

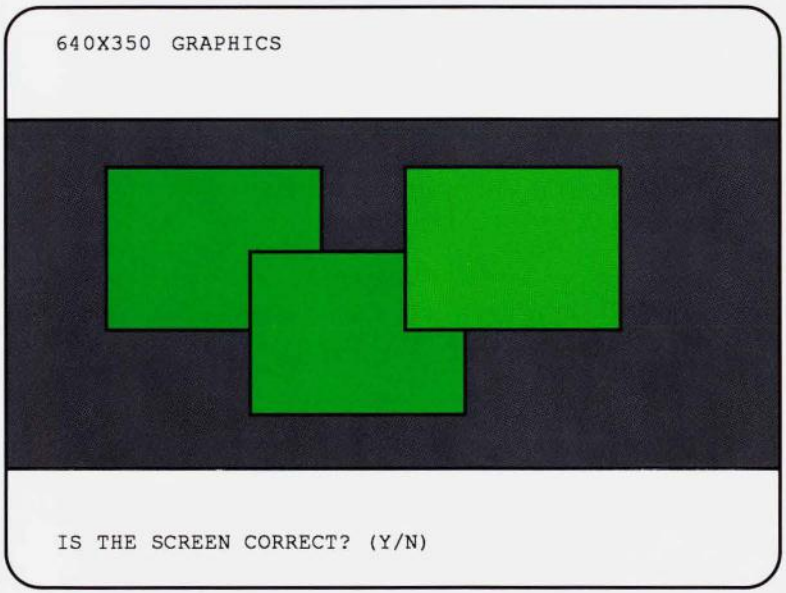
NO: Go through the steps in the Problem Checklist on page 2.

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Monochrome Display Diagnostics

Step 4 **Graphics, Screen 1, 640 x 350**
IBM EGA Monochrome
4 Color Graphics

Does your screen appear similar to the one below? Is the right block blinking?



YES: Continue to next step.

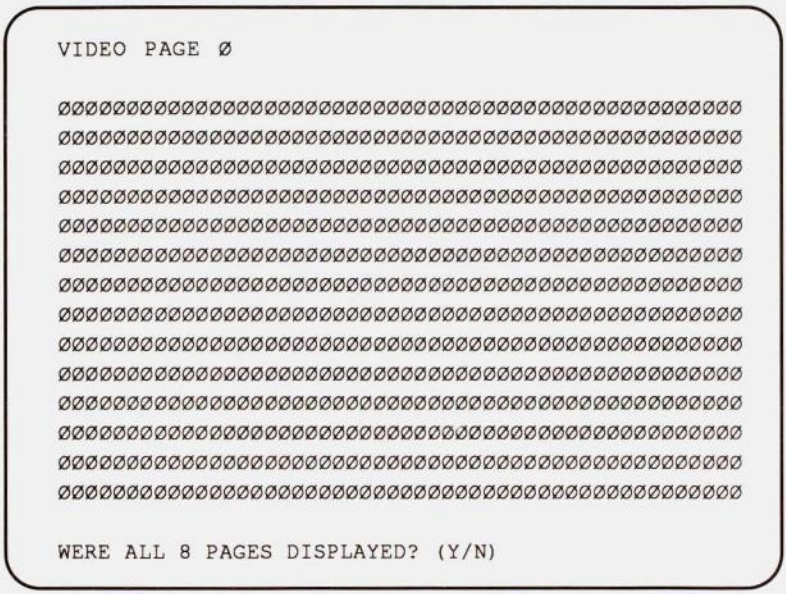
NO: Go through the steps in the Problem Checklist on page 2.

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Monochrome Display Diagnostics

Step 5 **Video Pages 0-7**

Press any key to to flip through all 8 video pages. Continue until "VIDEO PAGE 0" appears on your screen. Did all 8 pages appear similar to the one below?



YES: This ends the Diagnostics for the IBM Monochrome Display (or compatible monitor).

NO: Go through the steps in the Problem Checklist on page 2.

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