

SpeedSTAR 24

User's Manual

 **DIAMOND**
Computer Systems, Inc.

SpeedSTAR 24

User's Manual



DIAMOND

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Diamond SpeedSTAR 24 VGA User's Manual

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Introduction

Congratulations on purchasing the SpeedSTAR 24 VGA board! You are now the owner of the state-of-the-art SpeedSTAR 24 offering features and functionality exceeding any other Super VGA graphics adapter in its class, including:

- ❑ True color, 16.7 million color, VGA compatibility for professional level graphics.
- ❑ VGA Register and BIOS-level compatible.
- ❑ Conforms to VESA monitor and graphics standards. Provides 72 Hz monitor refresh rates and full compliance with VESA graphics extensions.
- ❑ High speed Turbo Windows drivers for Windows 3.x and enhanced AutoCAD Display List drivers for ADI 4.0 and 4.1 from Panacea.
- ❑ Extended graphics modes including 1280x1024, 1024x1024 (Virtual Screen mode), 1024x768, 800x600 with up 32,768 colors, and 640x480 with High Color and True Color capability.
- ❑ Extended text modes providing 132x44, 132x28, 132x25, 100x40, and 80x60 resolutions.
- ❑ Drivers for Lotus 1-2-3 (ver. 2.01 and 2.2), Symphony (ver. 2.0), WordStar (ver. 4.0), and WordPerfect (ver 5.0).
- ❑ Special utilities including video mode and monitor selection program, and a graphics based, mouse driven installation program.
- ❑ Backed by a 5 year warranty, unlimited technical support, and 24 hour BBS supporting 9600 Baud.

In addition, the SpeedSTAR 24 supports Diamond's TVGA Multimedia option card for professional level, NTSC and PAL video signals for rock solid, studio quality output.

Manual Overview

This manual is written to assist you in the installation and use of the SpeedSTAR 24. It is not intended to teach the basics of PCs or their use. It presumes that you are already familiar with the use of your PC. You may need to consult your computer system's manual or contact your dealer for detailed help concerning your particular computer configuration. This manual consists of four major sections. They include:

Chapter 1: Hardware Installation

This section will give you the information you need to install the SpeedSTAR 24 into your computer, and gives you the information you need to set jumpers or switches on the SpeedSTAR 24.

Chapter 2: Utility Programs

Included with the SpeedSTAR are several powerful utility programs to enhance its performance. This section will explain how to install these utilities and use them.

Chapter 3: Software Drivers

To operate Windows 3.x, AutoCAD and other supported programs, you will need to install the special drivers included with SpeedSTAR 24. This section will tell you how to do that.

Chapter 4: Technical Information

This section includes technical information about the SpeedSTAR 24, as well as how to contact Diamond's Technical Support staff should you require assistance.

Addendums

Warranty, Copyright and FCC notices.

Installation

The Diamond SpeedSTAR 24 User's Manual will help you install and use the SpeedSTAR 24 graphics adapter. Please take a few moments to read through this manual before installing the SpeedSTAR 24.

System Compatibility

The SpeedSTAR 24 will operate in any 100% IBM PC, PC/XT, PC/AT, PS/2 Model 30 or 30-286 compatible computer. This includes 386 or 486 compatible PCs which follow the IBM standards for compatibility.

Check with the dealer or manufacturer of your computer. The SpeedSTAR 24 board is compatible with the IBM VGA (Video Graphics Array) and IBM EGA (Enhanced Graphics Adapter). Most compatible systems support the IBM VGA or EGA standard. If your computer supports the IBM EGA, then the SpeedSTAR 24 should operate in your system.



Because of the wide variety of systems and configurations available today, Diamond Computer Systems, Inc. cannot be held responsible for any incompatibilities which may occur between your system's configuration and the SpeedSTAR 24.

Chapter

1



Although the SpeedSTAR 24 has been tested successfully in many different computer systems, there are hundreds of different PC "compatible" computers being sold. It is impossible to test the SpeedSTAR 24 with each one of them.

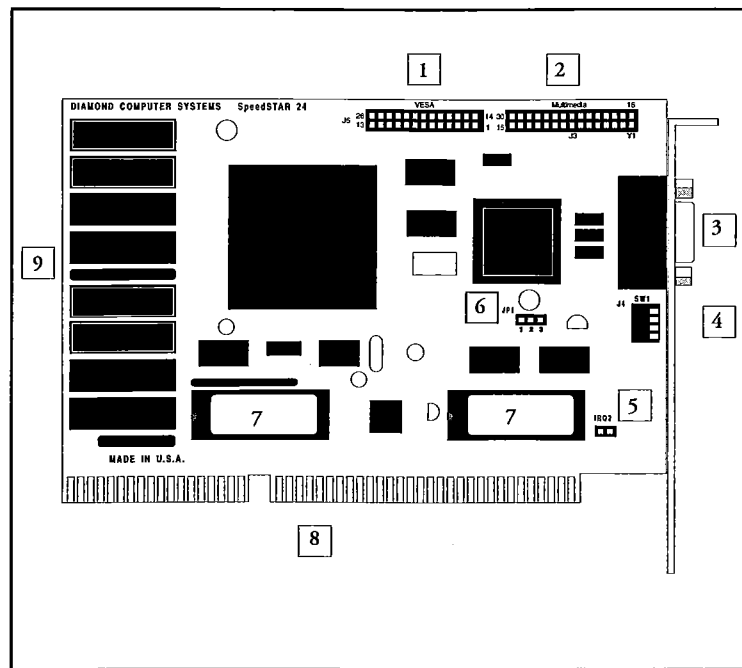


Some PCs are not compatible with EGA or VGA adapters. If you have a PC with a system ROM date earlier than 10/27/82 you may need to update your system ROM.



Use this diagram to locate switches and jumpers on the SpeedSTAR 24.

Chapter 4 furnishes other technical details, such as chip removal and installation, pin-out assignments and other information.



1. VESA Connector
2. Multimedia Connector
3. DB-15 Monitor connector
4. Switch Block
5. Jumper IRQ2
6. Jumper JP1
7. BIOS Chips
8. Edge Connector
9. RAM Chips

SpeedSTAR 24 Jumper and Switch locations

Installation Instructions

The SpeedSTAR 24 installation is very simple, requiring only three easy steps. If you are not experienced in installing peripherals into your system please seek assistance from your dealer or consult your computer's operations guide. These instructions presume that you are familiar with your hardware:

1. Power OFF the computer and related devices, remove the computer cover and find an empty slot.
2. After properly setting the SpeedSTAR 24 switch and jumper settings, (next section) install the SpeedSTAR 24 firmly into its slot.
3. Once the SpeedSTAR 24 is properly in its slot, secure the computer's cover, and attach any previously removed cables. Your monitor's cable connector must be compatible with the IBM VGA, DB-15 analog cable connector.

The SpeedSTAR 24 is now installed and ready to run.

JUMPER AND SWITCH SETTINGS

The SpeedSTAR 24 has jumper and switch settings which permit you to optimize its operation. The jumpers and switches are preset at the factory for "best case" computer configurations, and you may not need to change them. However, you should double check your configuration with the following information. Use the SpeedSTAR 24 layout diagram to determine the location of each jumper. The factory default jumper and switch settings follow:



Make sure you check to see if there are any video adapters installed in your system, causing a memory conflict.



For best performance, install the SpeedSTAR 24 in a 16 bit expansion slot.



Remember which cables go in which connectors. You may want to label the cables and connectors before disconnecting them.

Jumpers Connections



Refer to the user's guide included with your computer system for additional instructions concerning the installation options.

Switch and jumper settings may vary from system to system. Make sure your computer system is configured properly for the SpeedSTAR 24.

Incorrect switch or jumper settings could cause your system to operate improperly.



Few applications make use of IRQ2. Consult your software and hardware manuals to determine if you must change the jumper. For instance, network cards may require the use of IRQ2.

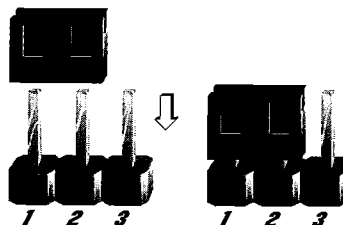
Jumper JP1: Sets Bus timing

Bus timings on motherboards vary. The jumper at JP1 is set to Normal Bus timing with the jumper block on pins 1 and 2. Position the jumper block over pins 2 and 3 if timing problems occur.

JP1 Default setting:

Pins 1 & 2 Normal Timing

Pins 2 & 3 Alternate timing



The jumper at JP1 is a two position jumper. The pins are labeled as in the figure at left. Place the jumper block over pins 1 & 2 for normal timing. Place the jumper block over pins 2 & 3 for alternate timing.

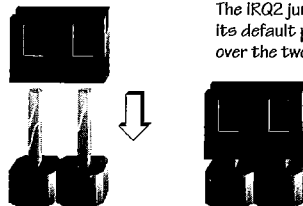
IRQ2 Jumper: Sets IRQ2 interrupt

IRQ2 is enabled on the SpeedSTAR 24 to conform to EGA register compatibility by placing the jumper block over both pins. To disable IRQ2, remove the jumper block.

IRQ2 Jumper Default setting:

ON = IRQ2 Enabled.

OFF = IRQ2 Disabled



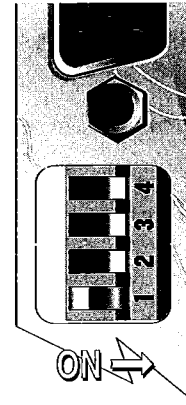
The IRQ2 jumper is a single position jumper. In its default position, the jumper block is placed over the two pins making the connection. If you want to disable IRQ2, place the jumper block over one pin only. This will open the connection, disabling IRQ2, and keep the jumper block handy for future use.

DIP Switch Settings

The SpeedSTAR 24 has a switch block which can be accessed through the mounting bracket. The factory default switch settings will work in most computer configurations, but you should check these with your personal configuration:

Switch	Configuration	Selling	
1	Reserved	ON	Default
2	Turbo Display Memory Access	ON	Default
	Normal display memory access	OFF	
3	16 bit BIOS Access	ON	Default
	8 bit BIOS access	OFF	
4	Turbo BIOS Access	ON	Default
	Normal BIOS access	OFF	

The SpeedSTAR 24 switch block can be accessed through the mounting bracket at the rear of your computer.



If you experience difficulty with the default settings, set the switches in the steps given below, until your system boots properly:

Step #	Set Switch 2	Set Switch 4
1	ON	OFF
2	OFF	ON
3	OFF	OFF

✓
The SpeedSTAR 24 comes with a menu driven utility program called VMODE.COM which will permit you to set up your SpeedSTAR 24 for your monitor.

The SpeedSTAR 24 defaults to IBM 8514 monitor frequencies if VMODE is not used to set the monitor type upon booting.

This includes IBM standard 80x25 VGA text mode and IBM 8514 standard 1024x768 Interlaced graphics mode.

✓
Switch 1: Reserved. This switch should remain ON.

Switch 2: You must install the SpeedSTAR 24 in a 16 bit expansion slot in order to use Turbo Display Memory Access.

Using the Utilities

Chapter

2

Your SpeedSTAR 24 comes with utilities and drivers which enhance the SpeedSTAR 24's performance and extend its capabilities. The SpeedSTAR 24 Utilities and Drivers diskette includes the following utility programs:

- VMODE.COM:** Versatile, menu or DOS command line driven program which lets you select monitor types, extended text modes or emulations.
- FASTBIOS.SYS:** Copies the SpeedSTAR 24's BIOS information into high speed system RAM for enhanced performance in PC/AT class compatible computers.
- EANSI.SYS:** ANSI.SYS device driver replacement supporting the extended text modes offered by the SpeedSTAR 24.



Your DOS Manual contains explanations of common terms and instructions on how to perform common operations, copying programs, using batch files or checking your disk directory. Refer to your DOS manual if necessary while performing the steps outlined in this section.

Installing the Utilities



These instructions use Drive A: as the default floppy drive and Drive C: as the default hard drive. Substitute the correct drive letters for your configuration.



The GO/GIS utility is merely a menu shell for the INSTALL.BAT program. After logging on to Drive A: you can bypass the GO installation program by entering INSTALL C: at the DOS prompt. The INSTALL.BAT program will create the same subdirectories on your selected hard drive.

To use the SpeedSTAR 24 utility programs you need to install them using the GO installation program found on the Utilities and Drivers diskette. The following directions will assist you:

1. With your system booted, insert the SpeedSTAR 24 Utilities and Drivers diskette in drive A: and log onto that drive,
2. Enter GO at the A: DOS prompt to initiate the installation program. The installation menu screen will appear on your screen.
3. Highlight the **Install Drivers** option and press Enter. You may use a Microsoft compatible mouse if it is connected and operating.
4. When prompted, enter the hard drive you wish to install the drivers and utilities to. Be sure to include the drive letter and colon (e.g. C:).

The SpeedSTAR 24 installation program will create a directory on your selected hard drive named \SS24, and copy the appropriate files to the hard drive. As it does so, the installation program will place the drivers and utility files in separate, appropriately named \SS24 subdirectories.

5. Once the installation program is complete, exit to the DOS prompt and log onto the newly created \SS24 directory. Enter GO at the DOS prompt and follow the menu options to set up your drivers for installation.

The utility programs are contained in the \SS24\UTIL directory. Log onto this directory to use the programs.

Using The Utilities

VMODE: The Display Mode and Monitor Selection Utility

VMODE.COM is a menu driven or DOS command line utility which allows you to set up SpeedSTAR 24 for various display modes or adjust timing parameters to match your monitor. To use the VMODE menu program, change to the \SS24\UTIL directory and enter VMODE at the DOS prompt.

The VMODE menu screen will appear. Here you can follow the on screen options to select graphics or text modes, or set up your monitor type. VMODE includes a set of Help screens to help you through your selections.

VMODE can also be used at the DOS prompt. By typing VMODE with a parameter (i.e., VMODE CGA), VMODE will carry out your setup commands automatically. The following information describes the available VMODE parameters.

The Compatibility Modes

Some software programs are written to specific graphics modes and require strict adherence to the video standard. VMODE enables the SpeedSTAR 24 to run these programs by setting it up for hardware register level operation in the video mode required.

To setup the SpeedSTAR 24 to run one of these modes, select the appropriate VMODE parameter. You may return to the default VGA mode by using the VMODE VGA parameter.

✓
IMPORTANT. You should check your monitor specifications with your VMODE utility program settings. Not all modes are supported by all monitors. Attempting to use modes which your monitor does not support may cause damage to your monitor, the SpeedSTAR 24 or other hardware in your system.

✓
CHECK YOUR
MONITOR'S
SPECIFICATIONS!

The SpeedSTAR 24 will support previous graphics standards (including MDA, Hercules, CGA and EGA) on analog compatible monitors which support their frequencies. We recommend that you check your monitor's specifications before you attempt to run the mode.

VMODE can use these parameters directly from the command line or in a batch file:

- VMODE MDA : setup for Monochrome Display Adapter compatibility.
- VMODE HERCULES : setup for Hercules Graphics Card compatibility.
- VMODE CGA : setup for Color Graphics Adapter compatibility.
- VMODE EGA : setup for Enhanced Graphics Adapter compatibility.
- VMODE VGA : setup for Video Graphics Array compatibility.

For example, to set up the SpeedSTAR 24 to operate in strict adherence to the Hercules Graphics Card, enter VMODE HERCULES at the DOS prompt.

The Extended Column Modes

SpeedSTAR 24 can display extended text modes for use in applications which support them. That is SpeedSTAR 24, when interfaced with appropriate monitor, can produce 132x44, 132x28, 132x25, 100x40, and 80x60 modes in addition to the standard 80x25 and 40x25 modes. An example where extended text modes might be useful is with terminal emulation software supporting 132-column displays.

Switching to an extended text mode is easy from the DOS prompt. Try the following:

- VMODE 132x25 : switch to 132x25 mode
- VMODE 132x28 : switch to 132x28 mode
- VMODE 132x44 : switch to 132x44 mode
- VMODE 40x25 : switch to 40x25 mode
- VMODE 80x60 : switch to 80x60 mode
- VMODE 80x25 : switch to 80x25 mode
- VMODE 100x40 : switch to 100x40 mode

Three additional modes are provided to change the scan line resolution. This accommodates software that specifically looks for a particular number of scan lines. The 400 scan line mode is the default and provides the most pleasing text resolution.

- VMODE 200 : operate in 200 scan lines in 40x25 or 80x25 text modes.
- VMODE 350 : operate in 350 scan lines in 40x25 or 80x25 text modes.
- VMODE 400 : operate in 400 scan lines in 40x25 or 80x25 text modes.

Other informational VMODE options are also available:

- VMODE TELL : Display current video mode
- VMODE VERSION : Display BIOS Version
- VMODE MONO : Disable color in display modes
- VMODE COLOR : Enable color in display modes
- VMODE VESA : Enable VESA BIOS Extensions

VESA BIOS graphics and text modes can be obtained by using the following parameters:

Graphics Modes

- VMODE 100h : 640x400/256 colors
- VMODE 101h : 640x480/256 colors
- VMODE 102h : 800x600/16 colors
- VMODE 103h : 800x600/256 colors
- VMODE 104h : 1024x768/16 colors
- VMODE 105h : 1024x768/256 colors

Text Modes

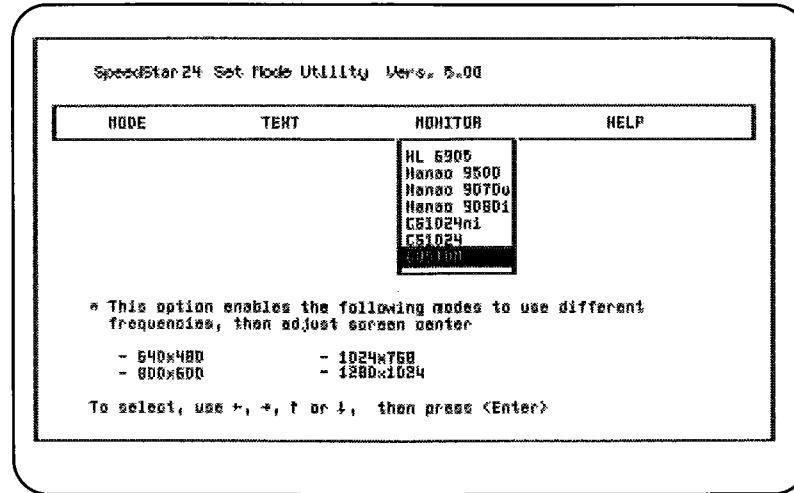
- VMODE 108h : 80 col x 60 row
- VMODE 109h : 132 col x 25 row
- VMODE 10Ah : 132 col x 43 row

✓
You will need to invoke the VMODE VESA parameter before you can set up the SpeedSTAR 24 to operate VESA modes.

Monitor Selection

You will need to run the VMODE menu interface to set up the SpeedSTAR 24 for your monitor. After invoking the VMODE program, select a listed monitor from the list that matches the specifications of your monitor, or use the Custom configuration option to set up VMODE to use your monitor's specifications. The Custom option is easy to use. Once you have selected this option, follow the on screen prompts and use the Help screens to guide you through its operation. The Custom option will store the timing and screen-centering information unique to your monitor.

✓
IMPORTANT. You should check your monitor specifications with your VMODE utility program settings. Not all modes are supported by all monitors. Attempting to use modes which your monitor does not support may cause damage to your monitor, the SpeedSTAR 24 or other hardware in your system.



✓
 Choose the MONITOR menu option and select your monitor from the list. If your monitor type is not listed, scroll to the bottom of the list and choose CUSTOM.

After you make your selection, you will be given several settings to choose from: HSYNC, VSYNC, INTERLACE, SYNC, and Polarity (for Horizontal or Vertical Sync). You will need to check your monitor's specifications and choose the options which are compatible.



Use the Up, Down, Left or Right arrow keys to move your cursor. Once you have made your desired selections, press Enter.

The following options are available for 640 x 480 mode

HSYNC	USYNC	INTERLACE	SYNC POLARITY (H/V)			
1. 31.5 Khz	60 hz	no	+/+	-/+	+/-	-/-
2. 37.8 Khz	72 hz	no	+/+	-/+	+/-	-/-

Compatible monitors:

- 1- IBM 8514 or fixed frequency monitor
- 2- NEC3FG/4FG/5FG, Sony1302/04 or equivalent

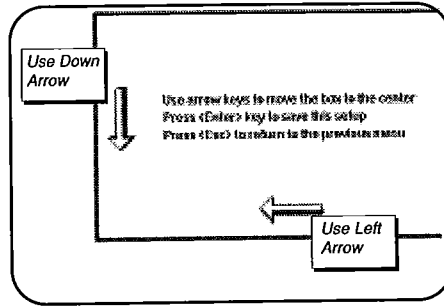
Note:

- * Higher sync mode produces less flicker.
- * Press <ESC> key, if need another selection or loss of sync.
- * Different sync polarities may change the screen size.

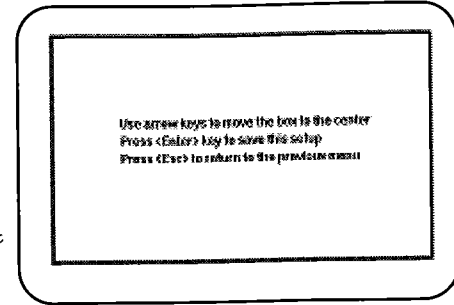
Use ↑ ↓ ← → keys to select timing and sync polarities, then press <Enter>



This is a VMODE screen representation provided as a reference for these instructions. Your screen may be different than the one shown.



✓
After making your horizontal and vertical sync selections, etc., a graphics box will be drawn on your screen. Use the arrow keys (Up, Down, Left and Right) to center the box on the screen, as shown at right.



The screen will also display other monitors which conform to the selected settings as a reference.

Once you have used the VMODE menu to select your monitor type, you can setup the SpeedSTAR 24 to use these settings each time you boot up by adding the line VMODE MONITOR to your AUTOEXEC.BAT file. You may also invoke the VMODE MONITOR command from the DOS prompt.

FASTBIOS.SYS Device Driver

The FASTBIOS.SYS device driver is located in the \SS24\UTIL subdirectory. It transfers the contents of the video ROM BIOS to the faster PC system RAM. This utility enhances video BIOS operation speed considerably when used in 80286, 80386, or 80486 based systems only. An alternative is using the shadow RAM built into some 386 or 486 systems.

FASTBIOS.SYS is installed by typing the line:

```
DEVICE=C:\SS24\UTIL\FASTBIOS.SYS
```

in the CONFIG.SYS file. It must be the first such device driver listed in the CONFIG.SYS file. If this is not done, the following message may result upon loading:

```
FASTBIOS NOT INSTALLED
```

This will happen when another (earlier installed) device driver has taken over the video interrupt; make sure the line occurs first in your CONFIG.SYS file.

Should an attempt be made to install FASTBIOS.SYS in anything other than an 80286 or 80386 based system, the following message will result:

```
FASTBIOS requires an 80286 or 80386 machine
```

When FASTBIOS.SYS is successfully installed, the following message appears:

```
FASTBIOS Installed
```

FASTBIOS.SYS may only be installed during system boot-up. Remember to re-boot the system after adding FASTBIOS to the CONFIG.SYS file, and make sure FASTBIOS.SYS resides in the same directory as CONFIG.SYS.

EANSI.SYS Device Driver

To permit the DOS ANSI commands to work with the SpeedSTAR 24's extended text modes, add

`DEVICE=ASS24\UTIL\EANSI.SYS` (be sure to include the path where EANSI.SYS resides)

to your CONFIG.SYS file. EANSI.SYS is compatible with the standard ANSI.SYS, but it must be remembered that EANSI.SYS is a replacement for ANSI.SYS, and the two should not be used at the same time.

EANSI.SYS may be used to select the extended SpeedSTAR 24 screen modes. This is accomplished by issuing an escape sequence with the "set mode" command, just as any standard mode would be selected with the normal ANSI.SYS. For example, screen mode 22 hex would be selected by sending the escape sequence:

`(Esc)[=34h`

to the screen. (Note that 34 is the decimal equivalent of 22 hexadecimal.) To select other modes, simply replace 34 with the number of the mode desired. You will find a list of modes in Chapter 4.

Software Drivers

Chapter

3

Drivers supporting the graphics capabilities of the SpeedSTAR 24 are included with the Utilities and Drivers disk. These drivers permit the use of the high resolution modes when properly configured. The software programs supported are:

Windows 3.1- Turbo Windows drivers

Windows 3.0 - Turbo Windows drivers

AutoCAD Full featured Display List Drivers for ADI 4.0 and ADI 4.1

Lotus 1-2-3 2.01 and 2.2 Extended Text mode drivers

Symphony 2.0 Extended Text mode drivers

Gem 2.2, Gem 3.x and Ventura Publisher 1.1, 2.0 drivers

WordPerfect 5.0 and 5.1 drivers

Please follow these driver installation instructions carefully. These instructions assume you are using drive A: as your default floppy drive and drive C: as your default hard drive. Substitute the correct drive letters for your personal configuration.

Before installing these drivers, verify that the graphics modes you wish to install will operate with your monitor. Not doing so may cause damage to your monitor, SpeedSTAR 24 or other hardware.



Other drivers not listed here are available from Diamond's Bulletin Board System, or from Diamond Computer Systems for a small handling charge.

Microsoft Windows 3.1 and 3.0 Drivers

✓
Use these instructions to install both Windows 3.1 and Windows 3.0.

✓
You can change the display type by clicking on the Windows Setup icon found in the Main desktop window or through the SETUP.EXE program in your WINDOWS directory.

The SpeedSTAR 24 contains drivers supporting the true color 640x480, 16.7 million color mode, and high resolution modes, including 800x600, 1024x768, 1024 x 1024 and 1280x1024. It also includes a replacement Windows SETUP.INF file to ease setup of the drivers in Windows 3.0 and an OEMSETUP.INF file for Windows 3.1. Follow the instructions listed below to install the drivers (these instructions assume you have already installed Windows in the \WINDOWS subdirectory).

1. Log onto the \SS24 directory and run the SpeedSTAR 24 Installation program (GO/GIS).
2. Select to install the Windows video drivers by highlighting the Windows option and double-clicking on your mouse or by pressing ENTER.
3. The Go Installation program will setup all of the SpeedSTAR 24 driver files on your drive and copy the new SETUP.INF file to the \WINDOWS\SYSTEM directory. Your original SETUP.INF will be renamed to SETUP.ORG for future reference.
4. Run the Windows SETUP.EXE program from the DOS prompt to select the new driver you wish to use from the SpeedSTAR 24 graphics modes listed.
5. Windows may prompt you to insert a disk or two to load the appropriate fonts files. After completing the above steps you can begin using Windows 3.x in the new modes.

AutoCAD ADI 4.1 Drivers

System Requirements:

A 386 or 486 PC with AutoCAD 386, Release 11/386, 3D Studio, or AutoShade 2.0 w/RenderMan.

Additional extended memory is recommended for optimal performance.

Quick Start

This section sums up the basics of installing and using SpeedCAD DLD386-VGA. Please see the rest of the manual for details.

Using Memory. You may wish to purchase and install additional RAM before installing DLD386-VGA, since it shares memory with AutoCAD Release 11 or AutoCAD 386. If AutoCAD is using a lot of memory, SpeedCAD DLD386 may not have enough. If there is significant hard disk activity while you are using DLD386, it may be an indication that you should add more memory to your system.

To install SpeedCAD DLD386

Go to the \SS24\ADI41 subdirectory and run DLDSETUP, following the instructions onscreen (press “?” at any prompt to get context sensitive help).

Select your desired resolution from the list.

Copy the FASTACAD.BAT file created by DLDSETUP to your AutoCAD directory. This file needs to be executed prior to running AutoCAD. You might also want to disable the copying of your VGA BIOS into Shadow RAM, as this may cause problems in some systems.

Run COLOR16 (for 16 color VGA setup) or COLOR256 (for 256 color VGA setup) to configure the driver with the colors you want to use for AutoCAD and AutoShade.

Reconfigure AutoCAD to use the ADI P386 display device; see the AutoCAD “Installation and Performance Guide” for details.

DLD386-VGA does two things to speed AutoCAD: First, it creates and maintains a Display List - a fast-displaying vector list of the current drawing - dramatically increasing performance on pans and zooms. Secondly, it creates and maintains a prescaled Fast Redraw List, allowing redraws to display an average of eight times faster than without the driver.

The only resource used by DLD386 is memory. The driver itself takes up about 35 Kbytes of RAM from extended memory, which means it does not affect normal DOS operation. The driver is loaded by AutoCAD at AutoCAD load time.

The Display List size can vary from one tenth to three times the size of the current drawing file; the size of the Fast Redraw List varies.

Since DLD386 shares extended memory with AutoCAD, no separate memory configuration options are required. But, if you notice AutoCAD accessing the disk a lot during PANs, ZOOMs, and REDRAWs while using DLD386, it means that DLD386 has begun paging to disk, and is therefore not operating at optimum performance. If this occurs frequently, you may want to use the DLDCLEAN (explained in detail later) command more often and/or you may need to add memory to your system to get the full benefit of using SpeedCAD DLD386.

SpeedCAD DLD386 Explained

SpeedCAD DLD386 (or DLD386) was developed to speed up AutoCAD REDRAWs, PANs, and ZOOMs. The driver is loaded into memory by AutoCAD and inserts itself between AutoCAD and the SpeedSTAR 24 board. It has no other effect on AutoCAD's operation besides speeding the program up. Installing the driver does not change any of the AutoCAD program files or alter any of the drawing files stored on disk. There is no change to the user's interface with AutoCAD.

AutoCAD stores drawings in a hierarchical structure, with simple elements intermixed with complex ones. Every time the screen is updated, AutoCAD must decode this structure. DLD386 works differently. While you are working, it translates the normal hierarchical structure into a Display List, a series of vectors. (The ability to support display lists was specifically added to AutoCAD with Release 10 via the ADI 4.0 interface.) When you pan or zoom, the driver scales the Display List, then writes the resulting vectors to the VGA hardware. Since the hierarchical structure does not have to be decoded, drawing proceeds very quickly.

In addition to the Display List, DLD386 also maintains a Fast Redraw List. This is an already-scaled version of the Display List and allows for even faster redrawing. The Fast Redraw List is cleared on pans and zooms (because they cause a change in what information is being viewed), so it only helps on redraws. The Fast Redraw List allows for quick removal of screen artifacts leftover from editing operations.

Pans and zooms, aided by the Display List, run from two to eight times faster with the new driver. And the Fast Redraw List further speeds things up to the point that redraws can be up to ten times faster with DLD386, compared to the VGA driver shipped with AutoCAD.

Installing and Configuring SpeedCAD DLD386

The following instructions will provide more detail of the SpeedCAD DLD installation. For a brief how-to, see the Quick Start section at the front of this chapter:

1. Log onto the \SS24\ADI41 and enter DLDSETUP to start the configuration program.
2. A DLDSETUP information screen will appear. Read the overview, then press any key to continue.

At any point during the configuration process you can press the ESC key to return to a previous menu.

3. Select which DLD386 driver you wish to use when prompted. The 16 color driver (DLDVGA.EXP), supports AutoCAD, and the AutoShade/3D Studio design screens in 16 colors at any supported resolution up to 1024x768. The 256 color driver (DLDVG256.EXP) supports AutoCAD in the SpeedSTAR 24 's 256 color modes.
4. Press F10 to progress to the next menu.

Getting Help at the Touch of a Key

Help during DLDSETUP is only a keystroke away. At any time, you can press the question mark ("?) key to get help information pertaining to the current DLDSETUP prompt. Please note that the DLDSETUP.HLP file must be present in order for help to appear.

5. The Single vs Dual Screen option is for dual monitor operation in AutoCAD. This requires two video cards, the SpeedSTAR 24 and a monochrome card to operate. If you choose **Automatic**, the driver will run single screen when AutoCAD is booted with the SpeedSTAR 24 as primary video source, or dual if AutoCAD is booted with a monochrome display as primary video source. Selecting **Always Dual** will cause the driver to always run in dual screen mode - don't select this mode if you don't have a monochrome board in your system.
6. The Flip Screen Method will eliminate screen clutter if, in rare cases, artifacts are left on the display when doing a flip screen back to the graphics display in AutoCAD. If this occurs on your system, use the Force Redraw option to eliminate this artifacting. The forced redraw will occur at normal speed, not DLD386 redraw speed. This prompt does not appear when you have selected the 256 Color VGA driver, since in the 256 color modes you are always running in the Force Redraw mode.
7. You may choose what Font size you would like to use for your AutoCAD menus, pull-downs, and dialog boxes: 8x8/8x14/8x16. All the fonts are 8 pixels wide, but the height varies. For resolutions above 800x600 the 8x16 font is recommended. The default is the 8x14 font.
8. Enter the method for updating the Display List: Remove/Overwrite/Disable. For trouble-free operation, the Overwrite option is recommended initially.

When an object is erased or moved, the Remove option causes its vectors to be removed from the Display List. The Overwrite option causes new "erase" vectors to be added to the Display List so the object will be drawn, then rubbed out on screen updates. This option avoids any major delays in list updates associated with the Remove option. Disable disables the Display List - the Fast Redraw List is still maintained unless you specifically disable it as well.



If you are using a Hercules compatible monochrome graphics adapter, it must be set up to utilize only standard IBM monochrome card memory, or B000 to B7FF.



DLD386 is NOT installed as a TSR, instead, AutoCAD uses the DSPADI environment variable to determine where the display driver can be found and what the driver's name is. AutoShade and 3D Studio both require the RCPADI and RDPADI environment variables to be set.

9. Enter the method for updating the Fast Redraw List: Remove/Overwrite/Disable. For trouble-free operation, it is recommended that you choose Overwrite initially.
10. Enter the number of lines of text you would like to appear at the bottom of your AutoCAD screen. You may select a number anywhere between 1 and 10. If you do not want any lines of text at the bottom of the display, use AutoCAD to disable the command area (see your AutoCAD Installation manual for more information). The default for this prompt is 3.
11. Choose the SpeedSTAR 24 from the list which appears when you press <F1>. Once you have made a board selection, you will have to select the resolution that you want to run AutoCAD and AutoShade to run at. Press the <F10> key once you have made your choice.
12. When completed, press the <F10> key to save the configuration information.

A batch file called FASTACAD.BAT will be created in the current directory, and the configuration file DLDSETUP.DAT will be created in either the directory pointed to by the DLDCFG environment variable or, if DLDCFG is not set, in the current directory.
13. Configure your colors by running COLOR16.EXE if you are using the 16 color VGA modes, or COLOR256.EXE if you are using the 256 color VGA modes.
14. Copy the newly created FASTACAD.BAT to your boot drive root directory, your AutoCAD directory, or into any directory on your DOS path. The actual configuration information for DLD386 is located in the file DLDSETUP.DAT, which was created or modified when you last ran DLDSETUP.

15. If you want the environment variables to be set automatically at startup, edit your AUTOEXEC.BAT file and add a line to run FASTACAD to the end of it; i.e., "FASTACAD". This assumes that the directory in which FASTACAD.BAT resides is in your PATH. If you have DOS 3.2 or earlier, the command needs to be at the end of your batch file because DOS can't return to the AUTOEXEC.BAT file after running the FASTACAD batch file. Alternately, you may want to just copy the contents of the FASTACAD.BAT file into your AUTOEXEC.BAT or other batch file you use to invoke AutoCAD.
16. Run the FASTACAD program to start the driver.
17. Change the AutoCAD display device configuration by starting AutoCAD, and then from the main menu, select option 5, Configure AutoCAD. From there, select option 3, Configure Video Display. Choose the ADI P386 display driver option as your display device. For more details, please refer to the AutoCAD "Installation and Performance Guide".
18. If you are going to be using AutoShade 2.0 w/RenderMan or 3D Studio with this driver, read Chapter 9 on how to configure these packages to work with DLD386.
19. You are now ready to use your accelerated AutoCAD. If you are not sure that AutoCAD is using DLD386, type DLDUSAGE at the AutoCAD command prompt while editing a drawing. If DLD386 is loaded and running, this command should return information about memory usage. If AutoCAD reports an error instead, your DLD386 is not properly loaded.

✓
If you are using DOS 5.0 You may use the CALL command. See your DOS 5.0 manual for more information on its use.

✓
If you get a message such as Out of Environment Space when you run FASTACAD.BAT, you will need to enlarge your environment. If you are running MS-DOS 3.2 or later, this is accomplished by adding SHELL=COMMAND.COM /P C:\E:768 to your CONFIG.SYS file. The /E:768 specifies an environment size of 768 bytes. Change this number as appropriate. You will need to reboot if you modify your CONFIG.SYS file.

Changing Colors

CustomColors is a color configuration utility. CustomColors gives you the ability to modify all your AutoCAD colors, including menu colors, text colors, dialog box colors, and even drawing colors.

CustomColors simulates an AutoCAD screen, complete with all possible objects. For editing the color configuration when you are running AutoCAD in 16 colors on a VGA, use COLOR16.EXE to load CustomColors, and for the 256 color VGA modes use COLOR256.EXE. Once you enter the utility, you are provided with the following configuration menu at the bottom of the screen. Select the menu item you wish to change, then select your colors from those displayed.

You can save the current color palette to DLDCOLOR.DAT. It will be saved to the directory pointed to by DLDCFG, or to the current directory if DLDCFG is not set. The Load option will reload the color information from the file DLDCOLOR.DAT. It will be loaded from the directory pointed to by DLDCFG, or from the current directory if DLDCFG is not set. If DLDCOLOR.DAT cannot be found, an error message will be displayed.

Advanced Features

Among the additional features not accessible through the installation program are a memory meter, a command to manually clean up the display lists, and a current color indicator.

Memory Meter

While in AutoCAD, you can check to see how much memory the display list and fast-redraw list are occupying at any time. The way to do this is by typing DLDUSAGE at the "Command:" prompt. DLDUSAGE will return information about how much memory each viewport is occupying.

Display List Cleanup

While in the Overwrite mode for display list maintenance, the display lists can get quite large because of multiple ERASEs, MOVEs, ROTATEs, etc. (see - The Remove/Overwrite Option). Instead of having to do a REGEN to recreate the display lists from scratch, you can use the DLDCLEAN command to clean up the display lists. The DLDCLEAN command removes all deleted objects from the display lists and requires as much time as an AutoCAD REDRAW to perform its operation.

Current Color/Layer Indicator

A small outlined box is now positioned on the left edge of the status line. Inside the box is the current AutoCAD drawing color. If the status line is disabled, this box will not appear.

Additional Commands

DLD386 supports a number of AutoCAD command line commands designed to allow advanced user better control over display list processing:

- | | |
|-----------|---|
| DLDHELP | Provides a one-line summary for every special DLD386-VGA command. It's recommended that you flip to the text screen to view the output. |
| DLDVER | Displays DLD386-VGA version and serial number. |
| DLDDLMODE | Displays the current mode of your redraw and display list (i.e. Remove, Overwrite, or Disabled). |

All of the following force a DLDCLEAN to be processed when executed:

- DLDFREEMEM** Frees up all display list memory currently in use by DLD386, and performs a DLDCLEAN. This is useful when DLD386 has gone a long time without a DLDCLEAN and has allocated more memory than is necessary. You may want to use this command instead of DLDCLEAN.
- DLDDLISTRM** Puts the display list in Remove mode
- DLDDLISTOV** Puts the display list in Overwrite mode
- DLDDLSTDS** Disables the display list
- DLDDLMODE** Displays the current mode of your redraw and display list (i.e. Remove, Overwrite, or Disabled).
- DLDFLISTRM** Puts the fast redraw list in Remove mode
- DLDFLISTOV** Puts the fast redraw list in Overwrite mode
- DLDFLISTDS** Disables the fast redraw list

Memory Usage and Lists

SpeedCAD DLD386 shares extended memory with AutoCAD via the PharLap Virtual Memory Manager. This means that DLD386 will automatically page to disk if it uses up all the RAM that AutoCAD has left for its use. See Appendix A.3 in the AutoCAD Installation and Performance Guide for more information on Virtual Memory Management. Please note that if you start seeing excessive hard disk accesses during PANs, REDRAWS, and ZOOMs while using AutoCAD with DLD386, try using the DLDCLEAN command more often. If this doesn't affect the amount of disk access, it's probably time to add more memory to your system.

Regarding display list memory, it's important to realize that DLD386 speeds up AutoCAD operations by creating a Display List in memory, and sending that list to the VGA for pans and zooms. Redraws are run from the Fast Redraw List, which is even faster. But both of these lists take up memory.

For production use, it is recommended that at least 1 megabyte be available for DLD386. To determine how much memory AutoCAD is using, use the status command while in AutoCAD (refer to Section 4.4.1, page 37, in the AutoCAD Installation and Performance guide for more information).

The Display List for a simple drawing might only require 20 Kbytes for the Display List. Complex drawings may require several megabytes. You may want to use the DLDUSAGE command described in the previous section to keep tabs on your display list usage as time goes on.

the file for the Display menu definition (usually found after a line that says *****POP4**). Go to the end of the definition, just past the line that starts off with **[Set Viewports...]**, and add the following two lines:

```
[~—]
```

```
[Clean Display List]^C^CDLDCLEAN
```

Once these two lines have been added, save the edited **ACAD.MNU** file and run AutoCAD. Pull up a drawing that uses the standard AutoCAD menus, and AutoCAD will recompile the **ACAD.MNU** file into **ACAD.MNX**. Once this compilation is complete, you should be able to use the Clean Display List option off of the Display menu to clean up **DLD386-VGA**'s display lists for all your normal drawings.

Using 3D Studio and AutoShade 2.0 w/RenderMan

AutoShade 2.0 with RenderMan

To configure AutoShade v2.0 to use DLD386, start AutoShade with SHADE /R, which will allow you to reconfigure AutoShade. For the display device, select P386 Autodesk Device Interface display driver, and for the rendering display select the P386 Autodesk Device Interface rendering driver. If you are running the display and rendering screen on the same monitor (i.e. single monitor), make sure to tell AutoShade this.

Autodesk 3D Studio

To configure 3D Studio, you need to edit the 3DS.SET file, located in your 3DS directory. Locate the line that starts with DEFAULT-DISPLAY. You want to modify it so that the line reads:

`DEFAULT-DISPLAY="RCPADI"` (include quotes as shown in the example)

Do the same with the line that starts with MAIN-DISPLAY (i.e. MAIN-DISPLAY=RCPADI). Make sure to remove the ";" in front of these lines. Also, if you selected to use the 256 color VGA driver during the set up, you may change the MATERIALS-DISPLAY line in 3DS.SET as well. Save your changes, and you're ready to use 3D Studio. See your 3D Studio documentation for additional information.

Lotus 1-2-3 and Symphony

The extended text drivers in the \SS24\LOTUS subdirectory support Lotus 1-2-3 (Release 2.01 and 2.2) and Symphony (Release 2.0) in 80x25, 80x60, 132x25, 132x28 and 132x44 modes. In addition, an "All Color Text Modes" driver is included which supports all five text display modes of the SpeedSTAR 24 VGA.



When initially installing the EGA drivers, it is important that the drivers (called IBM Enhanced Graphics in 1-2-3 and Separate in Symphony) be installed.

It is recommended that you read GETTING STARTED in the Lotus 1-2-3 or the Lotus Symphony documentation.

Installing The Drivers

You will be using the Lotus Install program to load the new SpeedSTAR 24 drivers. Use the Lotus documentation for information on how to use it. You will need to perform a "first time" installation for your Lotus product, and set it up for the IBM EGA format before continuing. Once you have done that the following steps to guide through SpeedSTAR 24 driver installation:

1. Copy the drivers contained in the \SS24\LOTUS subdirectory to your Lotus 1-2-3 or Lotus Symphony subdirectory and change to that directory.
2. Run the Lotus Install program and select **Advanced Options** from the main menu. Select **Add New Drivers to Library** and follow the prompts.
3. The **Advanced Options Menu** will appear on the screen. Select **Modify Current Driver Set** and choose your desired text mode from the **Select Text Display** menu. You will be able to select from the following modes:

VGA Adapter (All Color Text Modes)

VGA Adapter (80x60 Color Text Only)

VGA Adapter (132x28 Color Text Only)

VGA Adapter (80x25 Color Text Only)

VGA Adapter (132x25 Color Text Only)

VGA Adapter (132x44 Color Text Only)

4. After you have made your choice, select **Return to Menu**, and select **Save Changes** from the Main Menu.
5. The Install program will prompt you for the name of the newly installed driver set. Enter a distinct name for your driver set. The Install program will save the driver set under the new name and display the **Exit Menu**. You may create additional driver sets by selecting the **Advanced Options Menu**, **Modify Current Driver Set**, and **Save Changes** of the Install program.
6. To start Lotus with the new driver set, type the program name followed by the distinct driver set name you furnished. For example, if your driver set was named VGA28, enter **LOTUS VGA28** to set the display to 132x28 mode.

The most convenient way to switch modes is to install the All Color Text Modes driver named **SIMB0FLY.DRV**. This will employ a pop-up VGA mode selection menu in both Lotus 1-2-3 and Symphony. To activate the menu press the <Ctrl> and <A> keys simultaneously. Select the desired mode by moving the cursor until the mode is highlighted, and press <Enter>. The system beeps indicating the choice has been accepted. Exit to DOS, restart the program, and the new display mode will be in effect.

Drivers For GEM Version 2.2



Be sure your monitor can display 800x600 and/or 1024x768-pixel resolution. Choosing frequencies that your monitor cannot support may cause damage to your monitor, your SpeedSTAR 24 or other hardware in your system.



These installation procedures presume that you are familiar with installing and using GEM. Consult your GEM manuals for more detailed information.

The GEM Version 2.2 driver files require a new GEMSETUP.TXT file to be installed in place of the one on the GEM Device Driver Diskette #1. The drivers make full use of the extended graphics modes of the SpeedSTAR 24 graphics adapter. Before installing GEM, perform the following steps:

- 1) Make a backup copy of the GEM Device Driver Disk #1. This copy will be used in place of the original during installation.
- 2) Delete any unnecessary screen drivers from the newly copied diskette by typing DEL A:\SD*.* at the DOS prompt. Copy the file GEMSETUP.V22 and the screen drivers from the \SS24\GEM subdirectory to the new diskette as in the example below:

```
COPY C:\SS24\GEM\GEMSETUP.V22 A:GEMSETUP.TXT  
COPY C:\SS24\GEM\SD*.* A:
```

You may now install GEM using the new diskette. When the installation prompts to insert GEM's Device Driver Disk #1, insert the newly diskcopied diskette and the installation will continue. Complete the installation as instructed, by selecting one of two new SpeedSTAR 24 drivers:

- K. SpeedSTAR 24 Adapter (800x600) 16-Color Mode;VGA 800, or
- L. SpeedSTAR 24 Adapter (1024x768) 16-Color Mode;VGA 1024

GEM driver installation is complete.

Drivers For GEM/3 Versions 3.0 - 3.1

The GEM/3 driver files require a new GEMSETUP.TXT file to be installed in place of the one on the GEM/3 System Master Disk. The drivers make full use of the extended graphics modes of the SpeedSTAR 24 graphics adapter. Before installing GEM, perform the following steps:

Before installing GEM/3, perform the following steps:

1. Make a backup copy of the GEM System Master Disk. This copy will be used in place of the original during installation.
2. Copy the file GEMSETUP.V30 (or GEMSETUP.V31 file as appropriate) from the \SS24\GEM subdirectory to the new diskette as in the example below:

```
COPY C:\SS24\GEM\GEMSETUP.V30 B:\GEMSETUP.TXT (substitute
GEMSETUP.V31 for GEM version 3.1)
```

3. Format a blank diskette using the Volume command (e.g. C:FORMAT A: /V) and enter the following volume label: GEM SCREEN2 (all caps).
4. Copy the following files from GEM/3 Screen Disk #2 (both Ver. 3.0 and 3.1) to the newly formatted diskette in drive A:

```
COPY A:\GEMVDI.EXE A:
COPY A:\MDGEM?.SYS A:
```

✓
Be sure your monitor can display 800x600 and/or 1024x768-pixel resolution. Choosing frequencies that your monitor cannot support may cause damage to your monitor, your SpeedSTAR 24 or other hardware in your system.

✓
These installation procedures presume that you are familiar with installing and using GEM. Consult your GEM manuals for more detailed information.

5. Copy the following files from the \SS24\GEM subdirectory to the newly formatted diskette. The following commands assume the newly formatted diskette is on drive B:

COPY C:\SS24\GEM\SD*.VGA A:

Now the installation of VGA extended mode drivers is a 2-step process.

First, install GEM as instructed in the GEM manual, selecting

IBM 16-Color VGA for PS/2 (640x480) or Compatible

as the video driver. Complete the GEM installation normally. After completing installation, it is a good idea to start GEM to ensure that it operates properly before performing the next step.

Assuming GEM worked properly with the IBM VGA driver loaded, reinsert the System Master Disk and run GEMPREP again. This time, choose to change the existing configuration. Change the video adapter part of the configuration in order to load the SpeedSTAR 24 VGA graphics adapter.

Select from the following:

SpeedSTAR 24 Adapter (800x600) 16-Color Mode
SpeedSTAR 24 Adapter (1024x768) 16-Color Mode

The program will prompt to insert Screen Disk #2. Instead of GEM Screen Disk #2, insert the newly formatted diskette with drivers copied from the \SS24\GEM subdirectory. The driver will load and the program will conclude.

You may now begin using GEM.

Drivers for Ventura Publisher Versions 1.1 - 2.0

The 800x600 and 1024x768 Ventura driver files contained in the \SS24\GEM subdirectory must be installed AFTER Ventura Publisher has been installed on your system. The drivers make full use of the 800x600 or 1024x768 graphics modes of the SpeedSTAR 24 VGA graphics adapter.

Installation

1. Follow the Ventura installation instructions, and select the IBM Personal System/2 (640x480) two color driver for Ventura Version 1.1, or the IBM VGA or Compatible (640x480) 2 color driver for Ventura version 2.0.
2. Complete Ventura Publisher installation and verify proper operation using the installed IBM driver. Exit Ventura Publisher and use a DOS file editor to browse the VP.BAT or VPPROF.BAT file residing in the root directory of the hard drive.
- 3) Copy both of the SDxxx.VGA files from the \SS24\GEM directory to the \VENTURA directory (e.g. COPY C:\SS24\GEM\SD*. * C:\VENTURA).
- 4) Using a text editor, modify the VP.BAT or VPPROF.BAT file. Add the Ventura /S= switch:
for 800x600 16-grays: /S=SD800.VGA
for 1024x768 16-grays: /S=SD1024.VGA
- 5) Save the modified file back to the root directory with the VP.BAT or VPPROF.BAT file name.

Ventura will now boot into the selected mode.

✓
Be sure your monitor can display 800x600 and/or 1024x768-pixel resolution. Choosing frequencies that your monitor cannot support may cause damage to your monitor, your SpeedSTAR 24 or other hardware in your system.

✓
These installation procedures presume that you are familiar with installing and using Ventura. Consult your Ventura manuals for more detailed information.

WordPerfect 5.0 and 5.1 Drivers

The drivers contained in the \SS24\WP subdirectory will enable WordPerfect 5.0 and WordPerfect 5.1 to display at extended graphics resolutions. The following instructions will walk you through installation for either WordPerfect 5.0 or WordPerfect 5.1:

- 1) For WordPerfect 5.0: copy the WP800.WPD and WP1024.WPD files from the \SS24\WP subdirectory to your WordPerfect directory.
For WordPerfect 5.1: for WordPerfect 5.1, copy the WP51ET4.VRS file to your WordPerfect directory.
- 2) Load WordPerfect, and press SHIFT/F1 to enter the Setup menu.
- 3) For WordPerfect 5.0: from Setup, choose option 3.
For WordPerfect 5.1: choose option 2. This brings up the Get Setup: Display menu.
- 4) For WordPerfect 5.0: from the Get Setup: Display menu, choose option 5 Graphics Screen Type.
For WordPerfect 5.1: choose option 2.
- 5) For WordPerfect 5.0: from the Get Setup: Graphics Screen Type menu, and choose your display mode.
For WordPerfect 5.1: choose the ET-4000 VGA option which lets you choose from a menu of display choices.
- 6) Exit from the menus and begin using WordPerfect.

Technical Information

Chapter

4

This section of the manual is devoted to technical information about your SpeedSTAR 24. Here you will find sections on Troubleshooting, Contacting Technical Support, Returning A Product, SpeedSTAR 24 Specifications, Programming Information Graphics and Text video modes, and Pinout Assignments.

Troubleshooting

This section will assist you if you have difficulty in your installation or need some help in diagnosing your system configuration with the SpeedSTAR 24. There are a couple of good reasons why this section is important to read thoroughly. First, it will help you spot trouble areas and solve them BEFORE you have to call technical support. Secondly, this section may help you isolate the problem for technical technical support should you have to call them.

For each of these solutions you should remember the following:

1. When there are several possible solutions given, you may need to try each solution one at a time, rebooting the machine for each correction, until your SpeedSTAR 24 works properly.
2. Do not remove any peripherals from your computer while the machine is on.
3. After setting the SpeedSTAR 24 switches, you will need to reboot or reset the computer for the system to respond to the changes.
4. If you do have a problem, there may be instances where you are directed to remove another hardware adapter, change a firmware or software setting, or make other changes to your system. This will help to isolate the compatibility conflict. If your system responds successfully, you will know where the conflict occurs.

This section does not pretend to be the absolute authority concerning your system's configuration, or its interaction with the SpeedSTAR 24. It presumes that you are familiar with your PC and its configuration. You should have your system's technical reference guides handy, or have your dealer assist you.

General Questions

Question How do I tell if I have a SpeedSTAR 24?

Answer You can determine if you have a SpeedSTAR 24 by looking at the upper left corner of the card. "SpeedSTAR 24" should be printed in that location. Use the diagram of the board in Chapter 1 for reference. Another way is to look at the sign-on message at boot up. It should tell you that a Diamond SpeedSTAR 24 is installed in your system.

Question What happens if I get an error message saying "This is not a Diamond SpeedStar adapter?"

Answer You may be using the "stealth" option in QEMM (ST:M or ST:F). You will need to remove this option or add the line XST=C000 after the "stealth" option. You should also exclude from A000-C7FF from the memory manager.

Question How can I tell which way I should flip the switches. Which way is ON and which way is OFF?

Answer Chapter 1 has a diagram in the Switch section which shows you the correct way to set the switches.

Question Why is there such an involved sequence in setting the switches to get my SpeedSTAR 24 to operate. Do I have to follow the sequence you describe in Chapter 1?

Answer Not all systems are alike. As it says in Chapter 1, the SpeedSTAR 24 is made to work with

just about any 100% IBM compatible computer. Since there are literally hundreds of different types and configurations to choose from, the SpeedSTAR 24 may have difficulty with some of them. The switch setting sequences shown in Chapter 1 should be followed in the order given.

Question Can I actually display 16.7 million colors on my screen?

Answer No. In order to do that, your display would have to consist of over 16.7 million pixels. That is, your display resolution would have to support at least 4096x4096 (compare that with today's standard 1024x768 monitor). Actually, you don't really need to display 16.7 million colors for one picture. What it gives you is more palette colors to display your images more naturally. The availability of 16.7 million colors to draw from means your 24 bit images will be razor sharp. That's why professional photo editors use 24 bit color when editing pictures on a computer.

Question Software programs will not run with the SpeedSTAR 24 drivers.

- Answers**
1. Try running the software with standard VGA drivers supplied with the application program. Most software programs have standard IBM VGA drivers. If the program still does not work it may be a problem with the application.
 2. Have you removed all (TSRs) Terminate and Stay Resident programs from your system? Remove them and try the program again.
 3. You may be experiencing a memory address conflict between the software and the SpeedSTAR 24. Try, if permitted, to configure your software to exclude the upper memory range required by the video card - A000-C7FF.

Question How do I get the latest drivers for the SpeedSTAR 24?

Answer Dial our Bulletin Board System, at (408) 730-1100, to download them, or call Technical Support.

Question My SpeedSTAR 24 loses synchronization when I run a graphics program.

- Answer**
1. Check your manual monitor settings.
 2. Check to see if you have setup your monitor correctly with Vmode.
 3. Can your monitor support the graphics mode you are trying to operate?

Installation Questions

Question I booted up my PC and nothing happens, I do not get video. The SpeedSTAR 24 seems to boot up (I get blue sign on message on the screen) then the system hangs up. When I boot my machine I get 1 long beep and 2 short beeps.

- Answer**
1. Make sure the SpeedSTAR 24 is seated properly in its expansion slot.
 2. Make sure your monitor cable is securely fastened to the SpeedSTAR 24.
 3. Make sure your monitor cable has the proper pinout configuration. It should be able to work with a standard IBM VGA DB-15 analog graphics adapter. Check your monitor cable's pinouts with the pinout information given in this chapter.
 4. Check to see if your monitor is getting power. You should double check the electrical cable and the power switch.
 5. Try installing the SpeedSTAR 24 in a different slot.
 6. Try setting all of the SpeedSTAR 24 switches OFF.
 7. Change the SpeedSTAR 24 jumper JP1 settings. Placing the jumper block over pins 1 and 2 will enable Normal bus timing (this is the default setting). Placing the jumper block

- over pins 2 and 3 will set it up for Alternate bus timing. See Chapter 1.
8. Change the SpeedSTAR 24 IRQ2 jumper settings. Placing the jumper block over the pins will enable IRQ2 (this is the default setting). Removing the jumper block will disable it. See Chapter 1.
 9. Many of today's computers will let you use video shadowing. Disable any video shadowing in your PC CMOS setup. It may conflict with VGA settings.
 10. Check if there is another display adapter in your system. If there is, remove it and try rebooting the system.
 11. Check if your system has built in video on the motherboard. You should disable it. Your system user guide or dealer may be able to assist you.
 12. Check if your motherboard switches and configuration is compatible with the IBM VGA standard. We have come across several brands of "compatible" computers which do not permit any VGA to operate in them.
 13. Remove your SpeedSTAR 24 from its expansion slot and clean the edge connector with a soft eraser or clean dry cloth to remove any foreign matter such as natural oil from your hands. Do not rub the edge connector too hard.
 14. Remove your SpeedSTAR 24 from its expansion slot and make sure each of the socketed chips is seated firmly in its socket. Make sure the tiny legs or leads on the chips are positioned in the socket. Should you need to remove a socketed chip, use a chip puller designed for that purpose, or a small flat bladed screwdriver to ease the chip from its socket. If the legs are bent, carefully bend them back into position, then firmly reinsert the chip into its socket. If you are not experienced, please seek assistance from your dealer,

✓
Consider using Alternate bus timing when your computer experiences problems booting the SpeedSTAR 24. Many computers use bus timing which is not totally compatible with the accepted PC standard.

- or call technical support.
15. If possible, try the SpeedSTAR 24 in another machine. If the SpeedSTAR 24 works properly in another computer, then there is a conflict between your system's configuration (hardware, software or other item) and the SpeedSTAR 24. You will need to try to isolate the problem further by reconfiguring your system until you can find the cause of the problem.
 16. Check other cards in your system that might be using the same addressing space. Possible culprits are network cards, hard drive cards and scanner cards.
 17. Try booting from a standard DOS disk. Many times there are programs which get loaded into memory which are called Terminate and Stay Resident (TSR) programs. These programs may help your system work with various software or hardware in your computer. However, because they require various interrupts to function, some of these TSRs may conflict with the SpeedSTAR 24. You can avoid loading them into memory if you boot from a standard DOS diskette. If your SpeedSTAR 24 works after booting from a diskette, you will need to look at your CONFIG.SYS file or your AUTOEXEC.BAT file to determine where the conflicting software is.

Question

When I boot the computer the display is not black. It is a different color, such as blue.

Answer

Check the monitor connection. Generally blue, or other color screens are related to improper connections between the video card and monitor.

Utility Program Questions

- Question** How do I run the VMODE utility for a monitor not listed in the pulldown menu?
- Answer** You can set up your monitor to its specifications by using the CUSTOM option within the VMODE utility. To do this, run VMODE and select the monitor menu. Scroll through the monitor menu with the down arrow key until you get to the bottom of the list. When the CUSTOM option is highlighted press Enter. Follow the prompts to set up your monitor. When you're through, the VMODE utility will save the settings and load the CUSTOM parameters into memory.
- Question** Do I have to run through the VMODE utility menu each time I want to run my custom monitor?
- Answer** No. You can type VMODE MONITOR at the DOS prompt (or place the line in a batch file such as AUTOEXEC.BAT) and the VMODE utility will load the necessary parameters to operate the SpeedSTAR 24 with your monitor when your system boots.
- Question** My graphics screen shifts to one side after I have set it up properly with the VMODE utility program. After selecting my monitor type from those that are listed in the VMODE utility program and run Windows the display shifts to one side.
- Answer**
1. You should set up your monitor with the VMODE utility CUSTOM monitor option. Some monitors, though listed in VMODE, may be out of specification.
 2. Some monitors (ie. NEC 3D, Sony 1304, Zenith Flatscreen and others) do not have the logic incorporated into them to keep the screen centered when switching between text and graphics modes. If this happens, you will need to manually set the monitor adjustment knobs to center the screen.
- Question** When I run VMODE.COM it goes right back to a DOS prompt.

- Answer**
1. If you are using 386MAX you will need to edit your 386MAX.PRO file in your 386MAX directory. Find the line that reads VGASWAP and place a semicolon at the beginning of the line (i.e. ;VGASWAP).
 2. If you are using QEMM, you will need to exclude the memory area from A000-C7FF. Use the "x=a000-c7ff" command. This is a very common problem and this fix does work.

Question I am using a high resolution multi frequency monitor. The vertical refresh rate is set for 70Hz at 1024x768. When going into Windows or other graphics applications, my display size shrinks quite a bit on the screen.

Answer Use a slower vertical refresh rate. Your vertical refresh rate may be set too high for the monitor to support it. Your monitor may be compensating for the high frequency rate by reducing the screen size.

Question My Screen flickers in graphic modes.

- Answer**
1. Use the VMODE utility program to select the appropriate settings for your monitor. The SpeedSTAR 24 defaults to the IBM 8514 monitor specs on bootup. This setting will cause flicker at 1024x768 resolution.
 2. Your monitor may not support a "flicker free" vertical refresh rate at the graphics resolution it is operating at. Check your monitor specifications and run the VMODE utility again to insure your monitor is properly setup. You may need to use the CUSTOM monitor option.

Question Why does my system slow down when I use the FASTBIOS.SYS driver?

- Answer** Many of today's computers will let you use video shadowing. If you are using video shadowing in your PC CMOS it may be conflicting with the FASTBIOS.SYS driver. Use one or the other, but not both at the same time.
- Question** The FASTBIOS.SYS driver does not seem to work in my computer.
- Answer** FASTBIOS is made for use in an AT class machine. If you have a different type of system, do not use FASTBIOS.SYS.
- Question** Where can I get more detailed information on how to use EANSI.SYS?
- Answer** Your DOS manual will provide the programming information and sequences necessary to utilize ANSI.SYS. Use the hex modes listed later in this chapter for your desired extended text mode.
- Question** I would like to edit my DOS character fonts. Do you have a utility for this?
- Answer** You may obtain a DOS character font editing and load utility from the Diamond Technical Support Bulletin Board. There are many font editing programs available in the public domain. The SpeedSTAR 24 works with any which adhere to the standard VGA character set.

Windows Questions

- Question** Does Windows really support 24 bit color?
- Answer** Windows 3.x can. Windows is actually set up to operate with only a handful of colors (20 to be exact), but video drivers will extend its capabilities. The SpeedSTAR 24 Windows 3.x drivers support 24 bit color in Windows 3.x programs capable of displaying true color.

Question When I start Windows it goes back to the DOS prompt.

Answer Check your CONFIG.SYS file for a memory manager like QEMM or 386 to the MAX. If you are using 386MAX you will need to edit your 386MAX.PRO file in your 386MAX directory. Find the line that reads 'VGASWAP' and place a semicolon at the beginning of the line. If you are using QEMM, you will need to exclude the memory area from A000-C7FF. Use the "x=A000-C7FF" command.

Question I have installed the Windows drivers, and it is asking me for a .GRB file. Where is it?

Answer You may not have installed the Windows drivers correctly. If you selected the "OTHER" option in the Windows setup program, Windows will ask for the .GRB file. Reinstall the Windows drivers by using the GO installation utility program as described in Chapter 3.

Question When I drag my mouse in Windows I get "mouse trails" on my screen.

Answer

1. Flipping switch 2 on the SpeedSTAR 24 to the OFF position should fix the problem. If this does not work try turning off switches 2, 3, and 4.
2. Make sure you are using the mouse drivers which came with Windows 3.x, or current Windows 3.x compatible mouse drivers for your mouse or pointer.

Question When running Windows 3.x and SpeedSTAR 24 drivers which support more than 256 colors, the icons turn to black and white. How can I fix this?

Answer Windows 3.0 has a palette manager which does not work properly with Hi Color or True Color drivers. Programs look to this palette manager to find the colors necessary for their icons. Drivers which support more than 256 colors (e.g. 800x600 with 32768 colors) look for icon colors from a limited palette. When the colors are not available, the icon defaults to 2 colors, black and white. The ICONFIX program included on the Windows diskette will fix this problem.

- Question** When I run Windows the screen shrinks considerably, leaving a wide black border around the edge of the screen.
- Answer** The SpeedSTAR 24 will output consistent signals to conform to video standards such as the VESA (Video Electronics Standards Association) specifications. This includes "flicker free" refresh rates such as 70 or 72 Hz. The screen shrinking problem tends to be most common among 14 and 15 inch monitors that use automatic resizing to adjust the screen. At the higher refresh rates, some of these monitors do not resize the screen properly. The higher the refresh rate, the smaller the screen shrinks. There is no easy answer for this problem. To avoid it, use a lower refresh rate, or if possible, resize the monitor manually with its adjustments.
- Question** Do you have Windows 2.x drivers available?
- Answer** You may obtain Windows 2.x drivers from the Diamond Technical Support Bulletin Board. However, these drivers will not support the 24 bit capabilities of the SpeedSTAR 24.
- Question** After installing the Windows 3.x drivers and choosing a 1024x768 resolution, I boot up Windows and get returned to the DOS prompt.
- Answer**
1. The Windows setup program did not properly install the fonts needed for 1024x768 (8514 fonts). Try running Windows setup from the DOS prompt within your WINDOWS directory. When you choose the 1024x768 resolution again, you will be prompted to insert original Windows disks to copy fonts.
 2. You may have had another graphics card installed in the computer prior to the SpeedSTAR 24. You may need to reinstall Windows to utilize a new copy of the SETUP.INF file.

CAD Questions

Question When running AutoCAD R11, with the P386 driver configured for video display, I get an error message which says "Cannot Load ADI P386 Display Driver".

Answer Exit AutoCAD. At the DOS prompt, enter SET. If the four lines needed for Autocad to locate the driver are not present, change directory to \SS24\ADI41 and execute FASTACAD. Add "call C:\SS24\DL386\FASTACAD" to AUTOEXEC.BAT or ACAD386.BAT.

Question Why can't I find your latest Panacea AutoCAD DLD drivers on your Bulletin Board?

Answer The Panacea Drivers are not public domain property. They are special drivers made by Panacea for Diamond. We are pleased to include the drivers in our graphics product packages (such as the SpeedSTAR 24) but we do not give the drivers away for free. Placing it up on our Bulletin Board invites its free distribution.

Question When running an application program such as GenericCad, Microstation, or Animator Pro, Vesa modes do not appear as selections.

Answer Add the line "C:\SS24\UTIL\VMODE VESA" to your AUTOEXEC.BAT file.

Network Questions

Question My network card does not work with the SpeedSTAR 24.

Answer

1. You may have a memory addressing conflict. Try to find a memory location which does not conflict with the IBM video memory address at A000-C7FF.
2. Your network card may be conflicting with IRQ2. If so, disable IRQ2 on the SpeedSTAR 24, or change the IRQ2 setting on your network card.

Contacting Technical Support

If you could not find an answer to your problem after going through the Troubleshooting section, you should contact Diamond's Technical Support staff.

Before you call

Please remember that the technical support staff is here to help you get your SpeedSTAR 24 running smoothly. So when you call, please have the following information handy:

Proper name of the product: You would be surprised at how many people do not know the name of the product they are calling about. When you don't know the product's name, the Technical Support representative may have to ask you several questions to find out what it is you have. This can be time consuming for you.

The BIOS version of the product: This will help us to determine if you need a BIOS upgrade, as well as diagnose problems more quickly.

The SpeedSTAR 24 software driver version: Like the BIOS, the Utilities and Drivers disk has programs we update from time to time. You may need the update, or we may be able to understand where the problem lies a little easier by knowing what your current version is.

Motherboard make, BIOS version and chipset: Who makes your motherboard? Which system BIOS are you using? What type of chipset does your motherboard use? These will help greatly in troubleshooting the problem. If you do not know, ask your dealer.

Speed and type of your computer: Tell us the processor type (e.g. 386 or 486) and its speed (e.g. "runs at 33 MHz).

Manufacturer and model of monitor: Just like computers, there are hundreds of various monitors in use today. Let us know what you are using.

Contents of your AUTOEXEC.BAT and CONFIG.SYS files: Get a printout of the files handy or write them down. Almost every caller will get asked to read back the contents of these files, or to answer questions about them.

A list of installed hardware peripherals in your machine: Have a list handy of the make, type and models of other peripherals you are using, as well as any memory, I/O or IRQ information you can get.

A detailed description of problem: Try to answer what happened, using what software/hardware. Be as detailed as possible.

HOW TO CONTACT US			
Phone	408 736-2000	Send your correspondence to:	Diamond Computer Systems, Inc. Attn: Technical Support 532 Mercury Drive Sunnyvale, CA 94086
FAX	408 730 5750		
BBS	408 730-1100		
Send RMAs to the attention of the RMA # (e.g. Attn: RMA # HD2-0424-67)			

Returning A Product

If you have contacted our Technical support staff and we determine that you will need to return your product to us for warranty repair service, you will receive an RMA (Return Material Authorization) number. The following information will assist you in your warranty return:

Basic Steps to follow:

1. Call the Technical Support staff to receive an RMA #.
2. Package the product and return it to us with a proof of purchase, a receipt, a bill of sale, etc. Write the RMA # on outside of box where it is easily readable, and include a written note of the information we requested when you called the Technical support staff (e.g. system configuration information, AUTOEXEC.BAT and CONFIG.SYS information, etc.). Whenever possible, ship it to us in the container it came in. And always remember to include your name and return address.
3. We ask that you do not personally bring a defective product to us unless you observe the following: Package it as you would for regular shipping (see #2 above) and deliver it to our receptionist. Once your product is received it will be processed with other returned products. Without proper packaging it will get damaged. We will not accept it without proper packaging.

Do not expect to be given a replacement product while you wait. If you come in to drop off a product, it will be processed and returned as a normal RMA.

Things you should know before you call us for an RMA #:

1. **Warranty Repair:** Diamond will repair or replace (at our option) free of charge, products which are under warranty. We require you to furnish us a receipt, or similar bill of sale to determine if the product is under warranty. If you do not supply an adequate proof of purchase with the product you will be charged an out of warranty repair fee, determined by what was done to the product, plus labor costs.
2. **Shipping:** You must pay shipping charges to us, we will pay the shipping charges back. We do not provide express, or next day shipment of products. You will be required to pay for any next day shipping, or special handling you require.
3. **Cross Shipments:** We do not ship replacement products to you before we receive a defective product from you. This is normally called a "cross shipment." There are several reasons for this policy, including the fact that it is impossible to determine if the product is a warranty repair candidate (since we do not have the board here to check first). For instance, boards which may have been damaged due to negligence or non-authorized modification are no longer covered under our warranty.
4. **Updates and Upgrades:** We will determine if your product requires a software or hardware update when you call us. If it requires an update due to a compatibility problem we fixed, you will get the update free of charge. If the update was created to provide further enhancements to the product, or to upgrade the product, there will be a slight fee to cover our costs. We believe you should have our latest version of the SpeedSTAR 24 whenever practical or possible and will maintain an update/upgrade path for you.
5. **RMA Numbers:** If you return a product to us without first receiving an RMA number from our Technical support staff, we will return it. We cannot accept any returns for repair without prior approval, or proof of purchase information.

✓
We recommend that you do not mail your product to us unless you register and insure the product. The standard US Mail system does not permit tracking of your product should it get lost on the way.

SpeedSTAR 24 Technical Specifications

System Requirements

IBM PC, PC/XT, PC/AT (286, 386,486) compatibles, and PS/2 models 25, 30 and compatibles.

Bus

ISA compatible 8/16 bit slot, 16 MHz bus speed.

Connectors

Monitor: IBM VGA standard DB-15 pin (female).

Expansion: 26 pin, VESA compatible Port. Multimedia Extension Port

Dynamic RAM Configuration

1MB DRAM Standard

Monitor Compatibility

All standard Variable Frequency Analog compatible monitors, VGA compatible fixed frequency monitors.

Miscellaneous

Operates at approx. 5 Watts. MTBF: 15,000 hrs. Temperature: Operates from 0° to 50° degrees C

Humidity: 15% to 90%

Dimensions

6 .75" W x 5.00" H

Warranty

5 Years limited warranty. Technical Support and 24 hour Bulletin Board System.

Specifications are subject to change without notice

Extended Modes Programming

This section is intended for advanced users as a quick reference when programming the SpeedSTAR 24. The ROM BIOS supports a number of functions, which are easily accessed by programing in assembly language. The following is a list of Int10 (INT 10h) functions supported:

Interrupt 10 Functions:

00h	Mode Set	0Fh	Return Current Video State
01h	Set Cursor Type	10h	Set Palette Registers
02h	Set Cursor Position	11h	Character Generator Routine
03h	Read Cursor Position	12h	Alternate Select
04h	Read Light Pen Position [Not Supported]	13h	Write String
05h	Select Active Display Page	14h	Reserved
06h	Scroll Active Page Up	15h	Reserved
07h	Scroll Active Page Down	16h	Reserved
08h	Read Character at Current Character Position	17h	Reserved
09h	Write Character(s) at Current Cursor Position	18h	Reserved
0Ah	Write Character(s) only at Current Cursor Position	19h	Reserved
0Bh	Set Color Palette	1Ah	Display Combination Code
0Ch	Write Dot	1Bh	Return Functionality / State Information
0Dh	Read Dot	1Ch	Save/ Restore
0Eh	Write teletypewriter to Active Page		



For more detailed information on programming the ET-4000 chip set, refer to the Teeng Labs ET-4000 Data Book. Teeng Labs can be contacted at:
Teeng Labs
10 Pheasant Run
Newtown, PA 18940



For full detailed description on programming VGA, refer to:

1. IBM Personal System/2 Display Adapter Technical Reference, April 1987
2. IBM Personal System/2 and Personal Computer BIOS Interface Technical Reference, April 1987

For example, to select video mode (function 0):

```
xor  AH,AH    ; clear AH register for function 0
mov  AL,30h   ; mode number = 30h
                    ; set video mode to 800x600x16
int  10h     ; execute INT 10h
```

VESA SuperVGA BIOS Programming

VESA Modes Supported:

Graphics		Text	
100h	640x400x256	108h	80x60
101h	640x480x256	109h	132x25
102h	800x600x16	10Ah	132x43
103h	800x600x256		
104h	1024x768x16		
105h	1024x768x256		
106h	1280x1024x16		

The next section gives the VESA (Video Electronics Standards Association) SuperVGA BIOS Extension Programming Standard. The following VESA SuperVGA BIOS Extension (#VS900602, June 2, 1990) functions are called using Interrupt 10h.

VESA Functions:

- 00h Return SuperVGA Information
- 01h Return SuperVGA Mode Information
- 02h Set SuperVGA Mode
- 03h Return SuperVGA Mode
- 04h Save/Restore SuperVGA Mode State
- 05h SuperVGA Video Memory Window Control
- 06h Set/Get Logical Scan Line Length [Not Supported]
- 07h Set/Get Display Start [Not Supported]

Software Interface:

INPUT	AH=4Fh	SuperVGA Extended Function
	AL=00-07h	Function Number
OUTPUT	AL=4Fh	Function is supported
	AL!=4Fh	Function is not supported
	AH=00h	Function call successful
	AH=01h	Function call failed

NOTE: Other registers are used accordingly to each VESA function.

32k Color Programming

Hi Color Modes Supported: 2Eh 640x480 30h 800x600

The following is the programming guideline for the implementation of the Hi Color modes. These modes can support 16 bits per pixel and up to 32,768 colors. The programming considerations are similar to the VGA 256 color 8 bits per pixel modes. The pixel organization is 5 Red, 5 Blue, and 5 Green with most significant bit (bit 15) being reserved.

Hi Color BIOS functions to be called using Interrupt 10h:

1. Set Hi Color Mode: The call will attempt to set 16 bit/pixel mode. It will fail if there is not a Hi-Color DAC present, if current mode is invalid, or there are memory or other hardware limitations.

INPUT

AH = 10h
 AL = F0h Set Hi Color Mode Function
 BL = Mode Nmbr

OUTPUT

AL = 10h
 AH = 00h If successful
 <>00h If failed

2. Get DAC Type: The call will determine the DAC present on the video adapter. Currently, the SpeedSTAR 24 uses a Diamond 24 bit DAC.

INPUT

AH=10h
 AL=F1h Get DAC Type Function

OUTPUT

AL=10h
 AH=00
 BL=0 Normal DAC
 =1 Sierra Hi Color DAC
 =2 Diamond 24 bit DAC
 =3...n Reserved

✓
 These modes require a Hi Color DAC or equivalent, and 1 MB memory on the video adapter. Refer to the Extended Modes Programming section for the additional information such as video memory organization, bank switching, etc.

640x480x16.7 Million Color Programming

24-bit Mode supported: 2Eh (640x480x16.7m)

The programming considerations are similar to VGA 256 color 8 bits/pixel modes. The pixel organization consists of 3 bytes: 8 bits Red, 8 Bits Green and 8 Bits Blue. Each scan line is 2048 bytes with only 1920 bytes displayed (640x3). This mode will require Diamond's 24 bit DAC plus 1 MB memory on the SpeedSTAR 24.

24-bit BIOS functions to be called using the interrupt 10h:

1. Set 24-bit Mode: The call will attempt to set 24 bit/pixel mode. It will fail if there is not a 24-bit DAC present, if current mode is invalid, or there are memory or other hardware limitations.

INPUT

AH=10h

AL=E0h Set 24-bit Mode Function Call

BL=2Eh

OUTPUT

AL = 10h

AH = 00h Successful

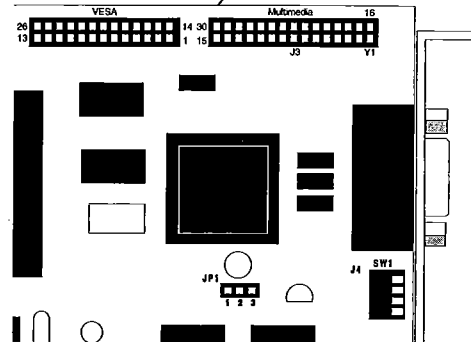
<>00h Failed

SpeedSTAR 24 VESA Feature Connector

The SpeedSTAR 24 comes with a Vesa Feature connector which is pin for pin compatible with the VESA standard. This connector is sometimes called the "Pass Through" or "Auxiliary" connector. The VESA connector allows easy access to the VGA circuitry thereby permitting add-on accessories such as the Diamond TVGA Multimedia Adapter or for use as a VGA "Pass Through" for other video adapters.

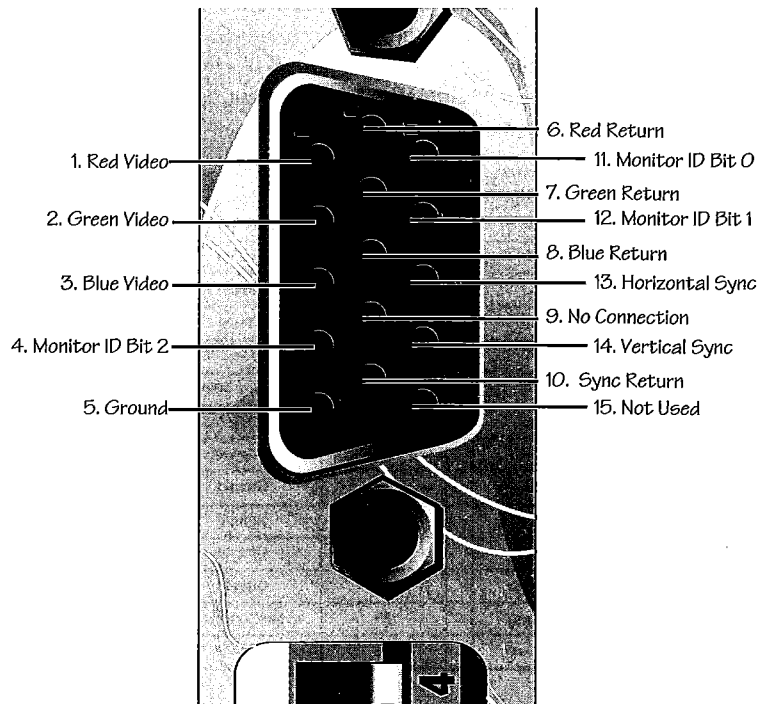
SpeedSTAR 24 VESA Feature Connector Pinouts			
Pin #	Function	Pin #	Function
01	PB	14	Ground
02	PG	15	Ground
03	PR	16	Ground
04	PI	17	Ext Video Select
05	SB	18	Ext Sync Select
06	SG	19	Ext Dot Clk Select
07	SR	20	No Connect
08	SI	21	Ground
09	Dot Clock	22	Ground
10	Blank	23	Ground
11	HSync	24	Ground
12	VSyn	25	No Connect
13	Ground	26	No Connect

✓
The VESA feature connector is located in the upper right corner of the SpeedSTAR 24, next to the Multimedia adapter. Pin 1 is clearly labeled.



DB-15 Analog Monitor Connector

The diagram at right shows the proper pinouts monitor connector on the SpeedSTAR 24. The SpeedSTAR 24 monitor connector conforms to the IBM VGA DB-15 (or "D-Shell" as it is sometimes called) analog monitor connector. Most Multi-Frequency monitors use this type of connector.



SpeedSTAR 24 Text and Graphics Modes

The following two tables will provide you with display mode information. Each chart gives you the Hexidecimal and Decimal mode numbers for the SpeedSTAR 24, the colors supported, the text screen format by columns and rows, the beginning memory buffer location, the character matrix size, maximum memory pages supported and the actual screen display size in pixels.

SpeedSTAR Graphics Display Modes							
Mode Hex	Mode Dec	Colors/Shades	Alpha Format	Buffer Start	Box Size	Max. Page	Display Size
4	4	4/256K	40x25	B8000	8x8	1	320x200
5	5	4/256K	40x25	B8000	8x8	1	320x200
6	6	2/256K	80x25	B8000	8x8	1	640x200
D	13	16/256K	40x25	A0000	8x8	8	320x200
E	14	16/256K	80x25	A0000	8x8	4	640x200
F	15	4	80x25	A0000	8x14	2	640x350
10	16	16/256K	80x25	A0000	8x14	2	640x350
11	17	2/256K	80x30	A0000	8x16	1	640x480
12	18	16/256K	80x30	A0000	8x16	1	640x480
13	19	256/256K	40x25	A0000	8x8	1	320x200
25	37	16/256K	80x60	A0000	8x8	1	640x480
29	41	16/256K	100x37	A0000	8x16	1	800x600
2D	45	256/256K	80x25	A0000	8x14	1	640x350
2E	46	256/256K	80x30	A0000	8x16	1	640x480
2F	47	256/256K	80x25	A0000	8x16	1	640x400
30	48	256/256K	100x37	A0000	8x16	1	800x600
37	55	16/256K	128x48	A0000	8x16	1	1024x768
38	56	256/256K	128x48	A0000	8x16	1	1024x768

SpeedSTAR 24 Text Modes								
Mode Hex	Mode Dec	Note	Colors/Shades	Alpha Format	Buffer Start	Box Size	Max. Page	Display Size
0	0		16/256K	40x25	B8000	8x8	8	320x200
0	0		16/256K	40x25	B8000	8x14	8	320x350
0	0	⊕	16/256K	40x25	B8000	9x16	8	360x400
1	1		16/256K	40x25	B8000	8x8	8	320x200
1	1		16/256K	40x25	B8000	8x14	8	320x350
1	1	⊕	16/256K	40x25	B8000	9x16	8	360x400
2	2		16/256K	80x25	B8000	8x8	8	640x200
2	2		16/256K	80x25	B8000	8x14	8	640x350
2	2	⊕	16/256K	80x25	B8000	9x16	8	720x400
3	3		16/256K	80x25	B8000	8x8	8	640x200
3	3		16/256K	80x25	B8000	8x14	8	640x350
3	3	⊕	16/256K	80x25	B8000	9x16	8	720x400
7	7		4	80x25	B0000	9x14	8	720x350
7	7	⊕	4	80x25	B0000	9x16	8	720x400
22	34		16/256K	132x44	B8000	8x8	2	1056x352
23	35		16/256K	132x25	B8000	8x14	4	1056x350
24	36		16/256K	132x28	B8000	8x13	4	1056x364
26	38		16/256K	80x60	B8000	8x8	3	640x480
2A	42		16/256K	100x40	B8000	8x15	4	800x600

Note

EGA text mode with 350 scan lines

⊕

9x16 character cell enhanced text modes with 400 scan lines

Monitors Supported

The SpeedSTAR 24 supports most fixed frequency and multi-frequency monitors that are compatible with those listed in this section. These monitors can be selected for use from within the VMODE.COM program. If you do not find your monitor type listed here you will need to setup your monitor with the VMODE utility CUSTOM option.

Fixed Frequency VGA

800x600 mode	: 31.5 Khz / 48 Hz	(+hsync/-vsync)	interlaced
1024x768 mode	: 31.5 Khz / 39 Hz	(-hsync/+vsync)	interlaced

IBM 8514

640x480 mode	: 31.5 Khz / 60 Hz	(-hsync/-vsync)	non-interlaced
1024x768 mode	: 35.4 Khz / 43 Hz	(+hsync/+vsync)	interlaced

NEC 2A

640x480 mode	: 35.4 Khz / 69 Hz	(-hsync/+vsync)	non-interlaced
800x600 mode	: 35.4 Khz / 56 Hz	(-hsync/-vsync)	non-interlaced

NEC 3FG, 3D

640x480 mode	: 37.8 Khz / 72 Hz	(-hsync/-vsync)	non-interlaced
800x600 mode	: 37.8 Khz / 60 Hz	(-hsync/-vsync)	non-interlaced
1024x768 mode	: 35.4 Khz / 43 Hz	(+hsync/+vsync)	interlaced

✓
You must insure that the frequencies you choose are compatible with your monitor. Diamond is not responsible for any damage caused to your monitor or other hardware if you select incompatible frequencies from within VMODE.

NEC 3FGX

640x480 mode	: 37.8 Khz / 72 Hz	(-hsync/-vsync)	non-interlaced
800x600 mode	: 48.1 Khz / 72 Hz	(+hsync/+vsync)	non-interlaced
1024x768 mode	: 48.9 Khz / 60 Hz	(+hsync/+vsync)	non-interlaced

NEC 4FG, NEC 5FG

640x480 mode	: 37.8 Khz / 72.0 Hz	(-hsync/-vsync)	non-interlaced
800x600 mode	: 48.1 Khz / 72.0 Hz	(+hsync/+vsync)	non-interlaced
1024x768 mode	: 56.5 Khz / 70.0 Hz	(-hsync/+vsync)	non-interlaced
1280x1024 mode	: 48.9 Khz / 43.5 Hz	(+hsync/+vsync)	interlaced

SONY 1302

640x480 mode	: 37.8 Khz / 72 Hz	(-hsync/-vsync)	non-interlaced
800x600 mode	: 37.8 Khz / 60 Hz	(-hsync/-vsync)	non-interlaced
1024x768 mode	: 35.4 Khz / 43 Hz	(+hsync/+vsync)	interlaced

SONY 1304

640x480 mode	: 37.8 Khz / 72 Hz	(-hsync/-vsync)	non-interlaced
800x600 mode	: 48.1 Khz / 72 Hz	(+hsync/+vsync)	non-interlaced
1024x768 mode	: 48.9 Khz / 60 Hz	(+hsync/+vsync)	non-interlaced

Nanao 9070u

640x480 mode	: 37.8 Khz / 72 Hz	(-hsync/-vsync)	non-interlaced
800x600 mode	: 48.1 Khz / 72 Hz	(+hsync/+vsync)	non-interlaced
1024x768 mode	: 48.9 Khz / 60 Hz	(+hsync/+vsync)	non-interlaced

Nanao 9080i

640x480 mode	: 37.8 Khz / 72.0 Hz (-hsync/-vsync)	non-interlaced
800x600 mode	: 48.1 Khz / 72.0 Hz (+hsync/+vsync)	non-interlaced
1024x768 mode	: 56.5 Khz / 70.0 Hz (-hsync/+vsync)	non-interlaced
1280x1024 mode	: 48.9 Khz / 43.5 Hz (+hsync/+vsync)	interlaced

HL 6605 (Mitsubishi) , HL 6905, Nanao 9500

640x480 mode	: 37.8 Khz / 72.0 Hz (-hsync/-vsync)	non-interlaced
800x600 mode	: 48.1 Khz / 72.0 Hz (+hsync/+vsync)	non-interlaced
1024x768 mode	: 56.5 Khz / 70.0 Hz (-hsync/+vsync)	non-interlaced
1280x1024 mode	: 48.9 Khz / 43.5 Hz (+hsync/+vsync)	interlaced

MPV1024 NI

800x600 mode	: 48.1 Khz / 72 Hz (+hsync/+vsync)	non-interlaced
1024x768 mode	: 48.9 Khz / 60 Hz (+hsync/+vsync)	non-interlaced

MPV1024

800x600 mode	: 35.2 Khz / 56 Hz (-hsync/-vsync)	non-interlaced
1024x768 mode	: 35.5 Khz / 43 Hz (+hsync/+vsync)	interlaced

CS1024ni (MAG Crystal Scan 14" non interlaced)

800x600 mode	: 48.1 Khz / 72 Hz (-hsync/+vsync)	non-interlaced
1024x768 mode	: 48.9 Khz / 60 Hz (+hsync/+vsync)	non-interlaced

CS1024 (MAG Crystal Scan 14")

640x480 mode	: 31.5 Khz / 60 Hz	(-hsync/-vsync)	non-interlaced
800x600 mode	: 35.4 Khz / 56 Hz	(-hsync/-vsync)	non-interlaced
1024x768 mode	: 35.4 Khz / 43 Hz	(+hsync/+vsync)	interlaced

CS1572FS (MAG Crystal Scan 15")

640x480 mode	: 38.0 Khz / 72.0 Hz	(-hsync/-vsync)	non-interlaced
800x600 mode	: 48.1 Khz / 72.0 Hz	(+hsync/+vsync)	non-interlaced
1024x768 mode	: 57.5 Khz / 72.0 Hz	(-hsync/+vsync)	non-interlaced
1280x1024 mode	: 48.9 Khz / 43.5 Hz	(+hsync/+vsync)	interlaced

Appendix A: Trademarks, Copyright & Warranty

Appendix

A

TRADEMARKS

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Sunnyvale, CA 94086

SpeedSTAR 24 WARRANTY

Your SpeedSTAR 24 comes with a five year hardware warranty. Diamond Computer Systems, Inc. (Diamond) warrants this SpeedSTAR 24 against defects in material and workmanship for a period of five (5) years from the date of purchase from Diamond or an authorized Diamond agent. This warranty applies only to the original purchaser of the SpeedSTAR 24 and is not transferrable. This warranty does not cover any incompatibilities due to the user's computer, hardware, software or any other related system configuration in which the SpeedSTAR 24 interfaces. Proof of purchase will be required before any warranty consideration by Diamond occurs.

This warranty does not cover any damage caused by negligence, non-authorized modifications, or parts installed without prior written permission from Diamond.

This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, nor as a result of service to the product by anyone other than by Diamond.

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Some states do not allow limitation of implied warranties, or exclusion or limitation of incidental or consequential damages, so the above limitations may not apply to you. This warranty gives you specific legal rights. You may have other rights which may vary from state to state.

This warranty applies only to this product, and is governed by the laws of the State of California.

Appendix B: FCC Notice

Appendix

B

FCC I.D #
FTUSPEEDD

This equipment generates and uses radio frequency energy and if not installed and used properly, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient the receiving antenna
- Relocate the computer with respect to the receiver
- Move the computer away from the receiver
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits

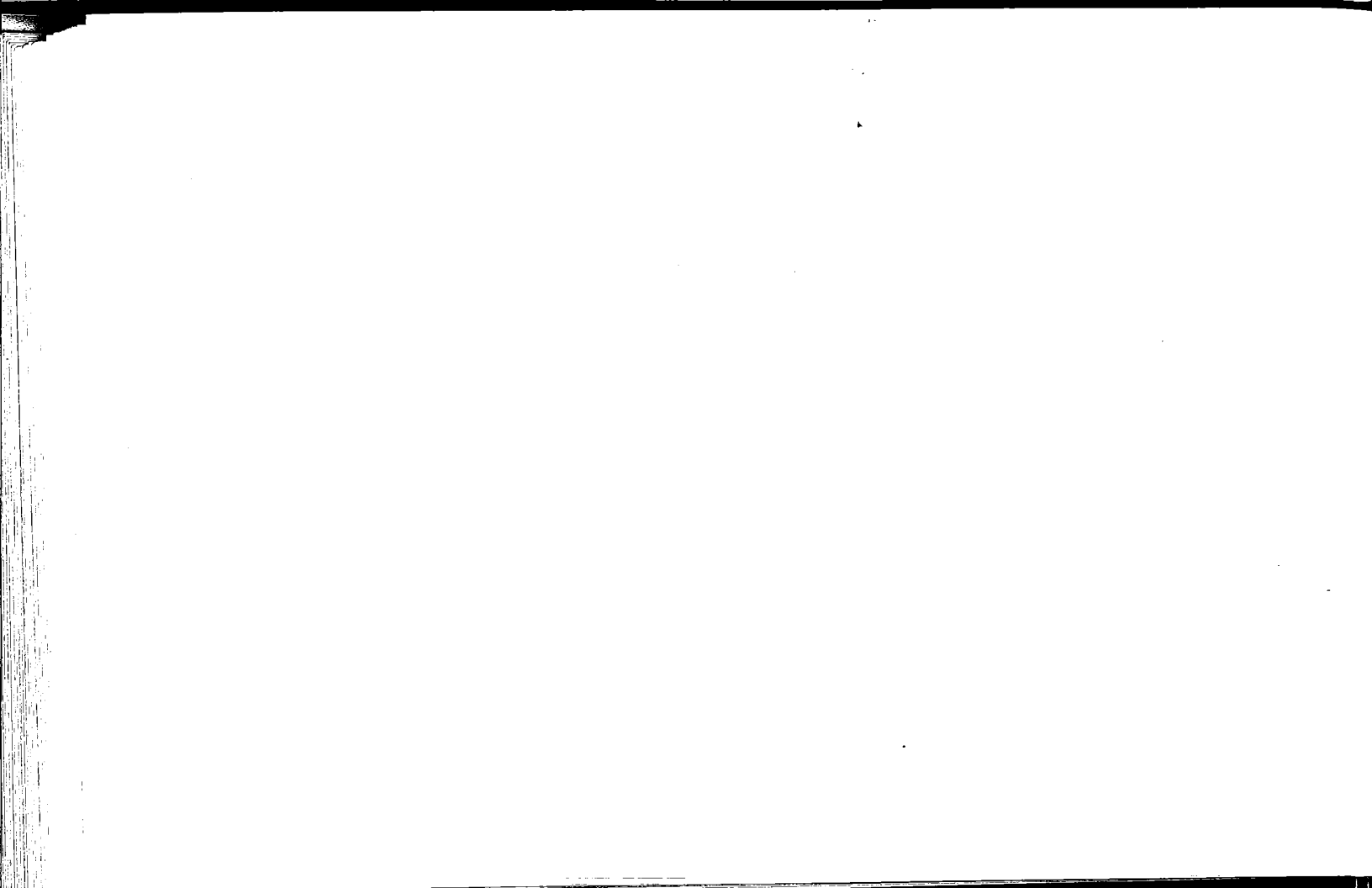
If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: **How to Identify and Resolve Radio and TV Interference Problems.**

This booklet is available from the U.S. Government Printing Office, Washington DC 20402, Stock No. 004-000-00345-4.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

"SHIELDED INTERFERENCE CABLE(S) MUST BE USED ACCORDING TO FCC 15.838D."



Diamond Computer Systems, Inc.
Product Registration Card

Complete and return this card to fully ensure 5 year warranty registration

Name _____ Title _____
Company _____
Street _____
City _____ State _____
Country/Zip _____ Phone # _____

Diamond product you purchased _____
Product configuration (Model, RAM, etc.) _____
Purchase date _____ Purchased from _____
Street _____ City _____
State/Country/Zip _____

Make and Model of Computer _____
Monitor _____

I decided to buy a Diamond product because:

- | | | |
|-------------------------------------|--|---|
| <input type="checkbox"/> Price | <input type="checkbox"/> Dealer Recommendation | <input type="checkbox"/> Compatibility |
| <input type="checkbox"/> Quality | <input type="checkbox"/> Resolutions Supported | <input type="checkbox"/> Performance |
| <input type="checkbox"/> Brand Name | <input type="checkbox"/> Driver Support | <input type="checkbox"/> Bundled Software |
- Other (specify) _____

I am interested in:

- | | | |
|---------------------------------------|-------------------------------------|--|
| <input type="checkbox"/> 24 bit color | <input type="checkbox"/> PAL Video | <input type="checkbox"/> High speed graphics |
| <input type="checkbox"/> Multimedia | <input type="checkbox"/> NTSC Video | <input type="checkbox"/> CD ROM |
- Other (specify) _____

I read:

- | | | | |
|--------------------------------------|---------------------------------------|---|----------------------------------|
| <input type="checkbox"/> PC Magazine | <input type="checkbox"/> PC Computing | <input type="checkbox"/> PC World | <input type="checkbox"/> Byte |
| <input type="checkbox"/> PC Week | <input type="checkbox"/> InfoWorld | <input type="checkbox"/> Computer Shopper | <input type="checkbox"/> Publish |
- Other (specify) _____

Principle software I use (number in order of importance)

- | | | | |
|------------------|------------------------|-------------------|-----------|
| ___ Windows 3.x | ___ Desktop Publishing | ___ Spreadsheet | ___ Paint |
| ___ Presentation | ___ Wordprocessing | ___ Draw Programs | ___ CAD |
- Other (specify) _____

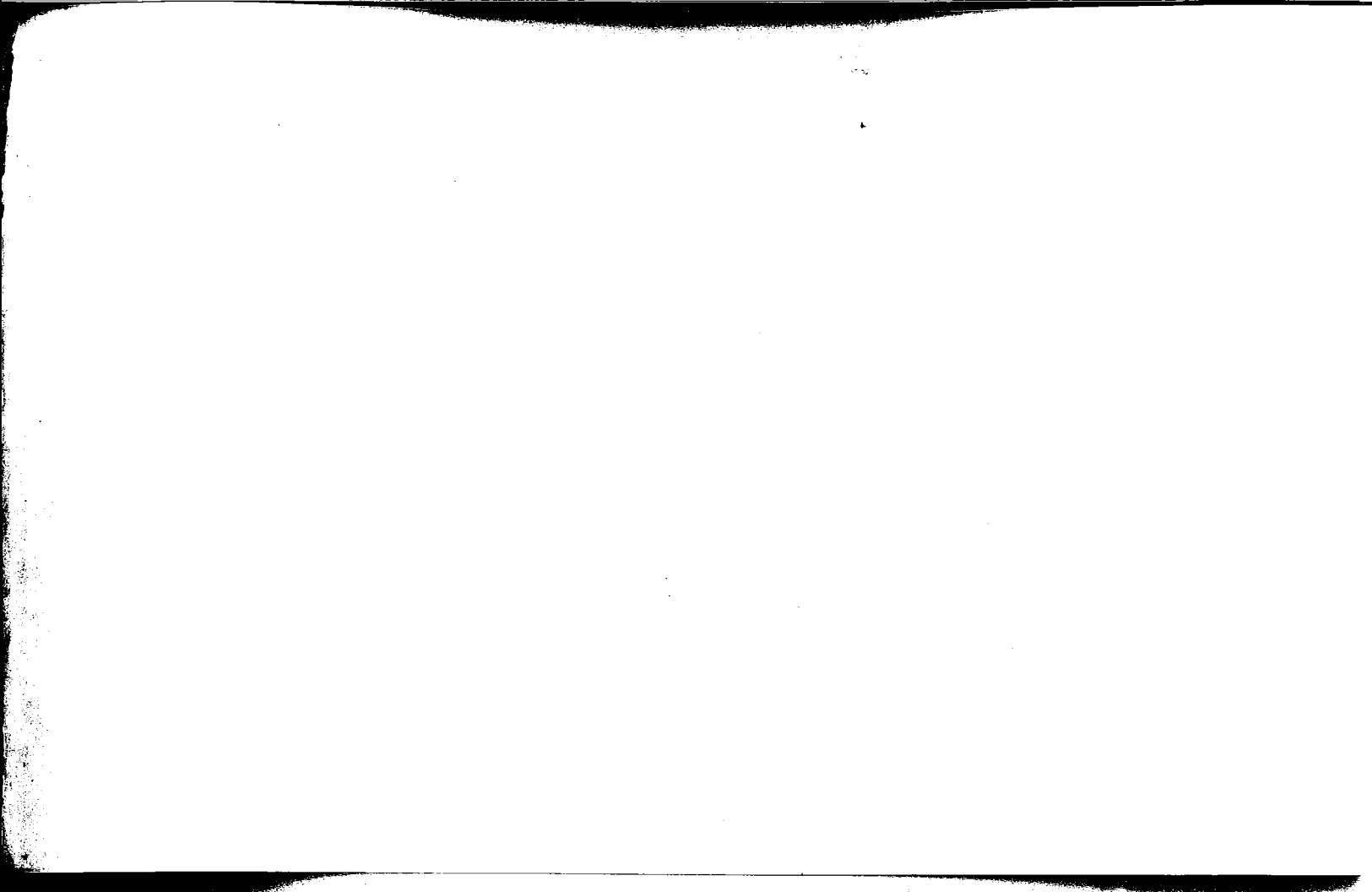
My ideal computer system includes: _____

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