

**TVGA 9000I**  
**GRAPHICS ADAPTER**  
**User's Manual**

TVGA 90001  
GRAPHICS ADAPTER  
User's Manual

# HARDWARE

Notice

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# Section 1

## Introduction

### Contents

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### 1-1 Features

Thank you for purchasing our VGA graphics board. The adapter works with you IBM PC/XT/AT (or compatible) to bring you super high resolution, 256-color capability, fast screen redraw, compatibility with most software, 3and hardware.

### Compatibility

- 486, 386, 286 and PC compatibles
- Register compatible with Hercules, MDA, CGA, EGA and VGA
- Non-Interlaced or Interlaced monitor support
- Compatible with Multi-Sync and PS/2 Monitors
- 72Hz VESA standard (800 x 600) resolution)
- 1024 x 768 70 Hz refresh

### Resolution And Color Selection

Memory	256K DRAM	512K DRAM
640 x 480	-	256-NI *
640 x 480	16-NI	16-NI, 256-NI
768 x 1024	-	16-I **
800 x 600	16-NI	16-NI
1024 x 768	4-I	4-1, 16-I/NI
* NI = Non-interlaced		** I = Interlaced

## Extended Text Display

- 80-column text modes in 30, 43, and 60 rows
- 132-column text modes in 25, 30, 43 and 60 rows

## Software Drivers Supported

- AutoCAD
- Autodesk
- CADKEY
- Framework
- GEM Desktop
- Lotus
- MS Windows
- MS Word
- P-CAD
- Symphony
- Ventura
- VersaCAD
- WordPerfect
- WordStar
- OS/2 Presentation
- Quattro Pro
- VESA BIOS Extension Manager

## 1-2 Check List

In addition to this manual, you should have the following:

- VGA Graphics Adapter
- Two Driver & Utility Diskettes

If any of these items are missing or damaged, contact your dealer.

Take this time to record the following information:

**Dealer:**

**Date of Purchase:**

**Invoice Number:**

**Dealer's Phone:**

Please have the serial number from your adapter ready when you call.

**IMPORTANT:** Keep all packaging materials that accompany your adapter in the event you need to return the product.



## Section 2

# Configuring Your VGA Adapter Contents

## Contents

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This section explains how to configure the adapter for use with your computer system.

**WARNING:** Incorrect setting or use of the adapter may result in damage to the computer system, monitor, or the graphics adapter itself. Carefully read through this manual before installing the adapter in your system. Stepbystep instructions in the "Installation" section will guide you through the installation process.

## 2-1 Hardware Configuration

Figure 1 is a diagram of the VGA graphics adapter. Board features are listed.

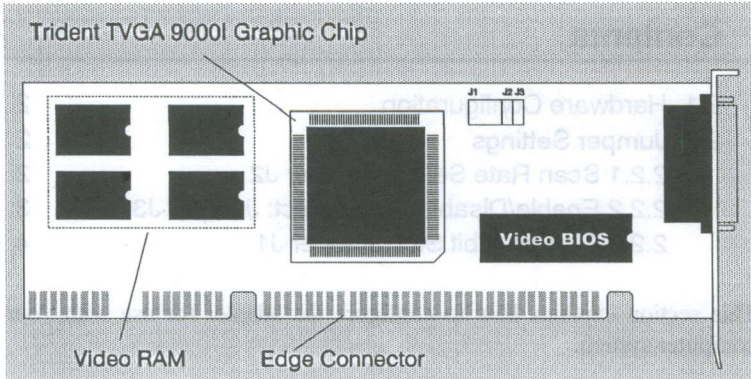


Figure 1. The TVGA 9000I Graphics Adapter

## 2-2 Jumper Settings

You can adapt the VGA adapter for special hardware configurations using the given jumpers on the card.

### 2-2.1 Select Scan Rate: Jumper J2

J2 allows you to configure the scan rates of extended VGA modes to be compatible with your multiscanning monitor. **J2 is operational for the 4 DRAM (512K) configuration only.** If your monitor can scan at 48.7KHz or higher, remove the Jumper pin across J2. J2 in the open position will allow noninterlaced display for 1024 x 768-16, and higher horizontal and vertical scan rates for 800 x 600-16. If your monitor cannot scan at 48.7KHz, leave Jumper J2 in the default position. This will give interlaced display for 1024x768-16 and reduced horizontal and vertical scan rates

for the 800 x 600-16 color. Reference Table 2 (page 3-4) and Table 5 (Appendix A-4) for more detail on scan rates. Figure 2 illustrates the two settings for Jumper J2.

Figure 2. J2 Settings for Selecting Scan Rate

J2: High Scan Rate  
(Pins 1 and 2 open)

J2: Default Scan Rate  
(Pins 1 and 2 connected)



**NOTE:** Be sure to check your multiscanning monitor's specifications before selecting the scan rate. Selecting a scan rate higher than the monitor can handle may damage the monitor.

**IMPORTANT:** 60Hz and 70Hz refresh rates are available for 1024 x 768, 16 colors, noninterlaced. The default value is 60Hz. To achieve 70Hz refresh rate (requires monitor with a scan rate of 56.4 KHz or higher), use the TVGACRTC program located on driver/utility diskette #1.

### 2-2.2 Enable/Disable Autodetect: J3

J3 allows you to enable/disable the BIOS Autodetect feature. The Autodetect feature controls the BIOS interface (8 or 16bit). When enabled (default) the BIOS will sense whether the VGA Adapter is in an 8bit or 16bit slot, and will configure the BIOS interface accordingly. When disabled, the board will boot up in its default 8bit BIOS interface setting.

**NOTE:** If you have problems booting your system, set Jumper J3 to disable autodetect, or place the card in an 8-bit slot.

**Figure 3. J3 Setting to Enable/Disable Autodetect**

**J3:Enable Autodetect**  
(Pins 1 and 2 open)

**J3:Disable Autodetect**  
(Pins 1 and 2 connected)



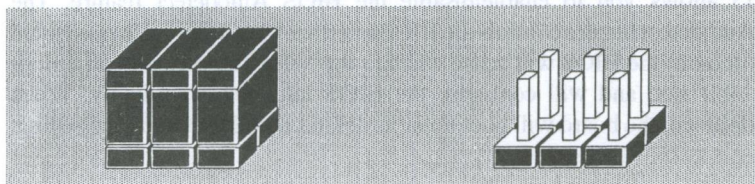
### 2-2.3 8-bit or 16-bit Slot: Jumper J1

Jumper J 1 is used to configure the VGA adapter for an 8bit or 16bit slot. Figure 4 illustrates the two settings for Jumper J1.

**Figure 4. J1 Settings for 8-bit Slot or 16-bit Slot**

**J1:8-bit Slot**  
(all pins connected)

**J1:16-bit Slot (Default)**  
(all pins open)



## Section 3

# Installation Contents

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The installation procedure for your VGA graphics adapter will vary slightly depending on the type of system you have (i.e. an IBM PC/XT/AT or compatible). Just follow the general installation instructions in this section, and look for any special steps you will need to take for your particular system. If you have an oldermodel PC, XT, or compatible, please read Appendix B before you install your graphics adapter.

### 3-1 Installation Procedures

To install the adapter into your system, follow these steps:

1. **Turn OFF all power to your system, including any peripherals** (printer, external drives, modem, etc.).
2. **Unfasten the cover mounting screws on your system.** For older IBM PCs, there are two cover mounting screws. However, the newer IBM XTs and compatibles use four screws, and newer ATs use five mounting screws. All cover mounting screws are located on the back of the computer.
3. **Remove the system cover.** After all cover mounting screws are off, carefully slide the system unit cover forward. When the cover will not go any further, tilt it up and lift it away.

4. If you have an IBM PC or PC/XT: IBM PC and PC/XT motherboards use a DIP switch to identify the type of video display adapter installed in the system. If you are installing the adapter in an IBM PC, XT, or compatible system, you will need to reset positions 5 and 6 of DIP switch block SW1 on your computer's motherboard. Use Figure 4 to locate switch SW1. Reset positions 5 and 6 of SW1 to the ON position. (If you have an XT compatible system, refer to your system's user manual for the correct location of SW 1.)

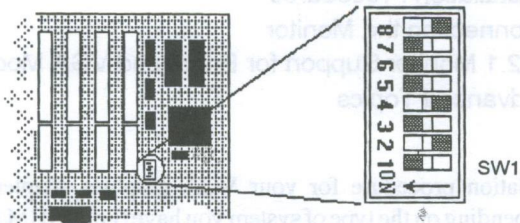


FIGURE 4. With a ballpoint pen set SW1, positions 5 and 6, to ON.

If SW 1 is a slide switch, you will need to use a pen or a paper clip to push positions 5 and 6 into the ON position. If SW1 is a rockerswitch, use the pen or paper clip to push the rockers at positions 5 and 6 down for the ON position.

**If you have an IBM AT or compatible system:** You don't need to reset any DIP switches in your system, since AT computers and compatible systems use the SETUP file instead of DIP switches to tell the computer what equipment is stored in your system. Just continue on to Step 5.

5. Select an open expansion slot. Select an appropriate expansion slot for the adapter. Any available 8bit slot in a PC/XT or compatible, or 1 6bit slot in a PC/AT or compatible will do. Remove the retaining screw that holds the slot cover in place. Slide the slot cover out and put the screw aside (you will need it to secure the adapter).
6. **Install the adapter.** To install the adapter in the selected expansion slot, place the gold fingered edge connector of the adapter directly above an expansion slot on the motherboard. Gently push the VGA graphic adapter

7. **Attach the adapter.** Use the screw you removed from the expansion slot in Step 5 to secure the adapter in place.
8. **Replace the computer's cover.** Secure the cover with the mounting screws you removed in Step 2.

You have now completed the installation of your new graphics adapter on your system. Before you use the system, however, please refer to Section 3.2, Connecting the Monitor.

## 3-2 Connecting the Monitor

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The adapter offers a 15 pin analog connector. When you connect your monitor to the adapter, be sure you have the right cable and cable connector. Fixedfrequency analog monitors come equipped with a 15 pin connector. Variable frequency analog or analog/digital monitors will require a 9 to 15 pin cable connector.

**Warning:** Connecting or disconnecting your monitor while your system and monitor are powered on may cause damage to your VGA adapter.

### 3-2.1 Monitor Support for Enhanced VGA Modes

Your monitor must be capable of displaying the mode you choose. Table 2 lists all available VGA display modes for the adapter, the monitors which support them, plus other information that may be useful.

Note that the color palette, i.e., the total number of possible colors to choose from, is 262,144 in all modes except for monochrome modes where the color palette is 2--black and the monitor phosphor color. For example, in mode 5E (~800x600256 colors), the total colors available for display on the monitor at one time is 256 different colors from a palette of 262,144.

**TABLE 2. Display Modes**

Mode (hex)	Type Format	Alpha Format	Resolution/ Colors	8514 <sup>1</sup>	Fixed	Multisync <sup>2</sup> Freq.	Buffer Start	Char Size
0,1	text	40x25	320x200-16	Yes	Yes	Yes	B8000	8x8
2,3	text	80x25	640X200-16	Yes	Yes	Yes	B8000	8x8
0 <sup>3</sup> ,1 <sup>3</sup>	text	40x25	320X350-16	Yes	Yes	Yes	B8000	8x14
2 <sup>3</sup> ,1 <sup>3</sup>	text	80x25	640X350-16	Yes	Yes	Yes	B8000	8x14
0 <sup>4</sup> ,1 <sup>4</sup>	text	40x25	360X400-16	Yes	Yes	Yes	B8000	9x16
2 <sup>4</sup> ,3 <sup>4</sup>	text	80x25	720X400-16	Yes	Yes	Yes	B8000	9x16
4,5	graphics	40x25	320X200-4	Yes	Yes	Yes	B8000	8x8
6	graphics	80x25	640X200-2	Yes	Yes	Yes	B8000	8x8
7 <sup>3</sup>	text	80x25	720X350-mono	Yes	Yes	Yes	B8000	9x14
7 <sup>4</sup>	text	80x25	720x400-mono	Yes	Yes	Yes	B8000	9x16
D	graphics	40x25	320x200-16	Yes	Yes	Yes	A0000	8x8
E	graphics	80x25	640x200-16	Yes	Yes	Yes	A0000	8x8
F	graphics	80x25	640x350-mono	Yes	Yes	Yes	A0000	8x14
10	graphics	80x25	640x350-16	Yes	Yes	Yes	A0000	8x14
11	graphics	80x30	640x480-2	Yes	Yes	Yes	A0000	8x16
12	graphics	80x30	640x480-16	Yes	Yes	Yes	A0000	8x16
13	graphics	40x25	320x200-256	Yes	Yes	Yes	A0000	8x8
50	graphics	80x30	640x480-16	Yes	Yes	Yes	B8000	8x16
51	graphics	80x43	640x473-16	Yes	Yes	Yes	B8000	8x11
52	graphics	80x60	640x480-16	Yes	Yes	Yes	B8000	8x8
53	graphics	132x25	1056x350-16	Yes	Yes	Yes	B8000	8x14
54	graphics	132x30	1056x480-16	Yes	Yes	Yes	B8000	8x16
55	graphics	132x43	1056x473-16	Yes	Yes	Yes	B8000	8x11
56	graphics	132x60	1056x480-16	Yes	Yes	Yes	B8000	8x8
57	graphics	132x25	1188x350-16	Yes	No	Yes	B8000	9x14
58	graphics	132x30	1188x480-16	Yes	No	Yes	B8000	9x16
59	graphics	132x43	1188x473-16	Yes	No	Yes	B8000	9x11
5A	graphics	132x60	1188x480-16	Yes	No	Yes	B8000	9x8
5B	graphics	100x75	800x600-16	Yes	No	Yes	A0000	8x8
5B	graphics	100x75	800x600-16	No	No	Yes <sup>5</sup>	A0000	8x8
5C <sup>10</sup>	graphics	80x25	640x480-256	Yes	Yes	Yes	A0000	8x16
5D <sup>10</sup>	graphics	80x25	640x480-256	Yes	Yes	Yes	A0000	8x16
5E <sup>8,10</sup>	graphics	100x75	800x600-256	No	No	Yes <sup>7</sup>	A0000	8x8
54 <sup>8,10</sup>	graphics	128x48	1024x768-16	Yes	No	Yes	A0000	8x16
5F <sup>9,10</sup>	graphics	128x48	1024x768-16	No	No	Yes <sup>3</sup>	A0000	8x16
60 <sup>8</sup>	graphics	128x48	1024x768-4	Yes	No	Yes	A0000	8x16
61 <sup>8,10</sup>	graphics	96x64	768x1024-16	No	No	No	A0000	8x16



## Table Notes:

1. 8514 is an IBM PS/2 monitor.
2. Multisync monitors support both Analog and TTL operations e.g. NEC Multisync 3D).
3. EGA text modes with 8 x 14 and 9 x 14 character sizes and 350 lines vertical resolution.
4. VGA text modes with 9 x 16 character size and 400 lines vertical resolution.
5. Check to see if your multisync monitor supports the interlaced or non-interlaced versions of the mode (monitor must support horizontal scan rate of 48.7 KHz or 56.4 KHz for noninterlaced display).
6. A portrait monitor is required to run this mode (e.g. Magics -1 5FP).
7. Not every multisync monitor works (e.g. NEC 3D does not support low frequency).
8. Interlaced mode (Jumper J2 connected).
9. Noninterlaced mode (Jumper J2 not connected).
10. Supported by 4 DRAM configuration only.

**Note:** You may need to adjust your multifrequency monitor to display these modes properly. Use the horizontal and vertical size and position controls on your monitor to display without distortion.

### 3-3 Advanced Topics

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This section covers information intended for users familiar with assembly language programming. The VGA standard supports a variety of video modes which are accessible through a video BIOS call from assembly language or other higherlevel programming languages.

When you start up in DOS the screen display defaults to the standard 80 column text or alphanumeric mode. This is mode 34 on a color system or mode 7<sup>A</sup> on a monochrome VGA system (see footnote references in **Table Notes** section above).

## Section 4

# Troubleshooting Tips Contents

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## 4-1 Hardware Troubleshooting

The following are some recommended steps to take if the VGA Graphics Adapter will not boot or operate properly in your system:

1. Check to see if the card is firmly seated in its bus expansion. sure it is not making contact with any other cards in the system.
2. Be sure your monitor is properly connected to the card. Be sure your monitor's pin definitions match those of your IMPACT card.
3. Be sure your system's power supply is operating properly (i.e. fan operates, system power light comes on).
4. If you are using an IBM PC/XT or compatible, be sure switches 5 and 6 of S with Block SW 1 on your motherboard are set to ON.
5. If you are using an IBM PC/XT or compatible, check to see your system BIOS is dated October 27, 1982 or later. System BIOS Versions prior to this date will not support the adapter card.

## **Configuration Requirements for EMS Cards, LAN Cards, and SCSI, ESDE, or RLL Controllers**

No special hardware configuration is required for EMS Cards, LAN Cards, and SCSI, ESDI, or RLL Controllers. The BIOS automatically detects memory conflicts between the VGA card and other system peripherals and boots the VGA card accordingly. In the unlikely event the BIOS auto configuration scheme does not work, configure Jumper J1 for an 8-bit interface and then place the card in an 8-bit slot.

## **4-2 Commonly Asked Questions**

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### **4-2.1 Monitors**

- Q. Why does the display shift or change sizes when I switch modes?
- A. Some monitors lack autosizing features or just do not synchronize properly to the video board output. In some cases, horizontal and vertical display adjustments may be necessary.
- Q. What kind of monitor do I need to display 800x600 or 1024x768 resolution?
- A. To display 800x600 resolution at 56Hz refresh, your monitor must be capable of a 35.2KHz horizontal scan rate (e.g., NEC 2A, 3D). At 72Hz refresh, your monitor must be capable of a 48.0KHz scan rate (e.g., Sony HG 1304, NEC 4D, 5D, Seiko 1450).

To display 1024 x 768 interlaced, your monitor must be capable of a 35.5 horizontal scan rate (e.g., NEC 3D, Seiko 1430 or 1440). To display 1024 x 768 noninterlaced (60Hz), your monitor must be capable of a 48.7KHz scan rate (e.g., Sony HG 1304, NEC 4D, 5D, Seiko 1450). For 70Hz noninterlaced display, your monitor must be capable of a 56.4 KHz scan rate (e.g. NEC 5D, Mitsubishi 6915).

## 4-2.2 Systems

- Q. Can I have two graphics boards in my system at the same time?
- A. A monochrome card may co-reside with the VGA adapter. you cannot have an EGA, CGA, or another VGA card coresident.
- Q. I see "mouse droppings" on the screen when I move my mouse around. Is this a problem with my mouse?
- A. Could be. The version of your mouse driver may not support VGA. Another possibility is that the DRAM on your card is not seated correctly or is not the right speed. If you have added your own DRAM to the card, make sure it is Fast Page Mode DRAM .

## 4-2.3 Software Applications

- Q. When I run a system utilities program (PC Tools, Norton utilities, etc.) it tells me I only have 256K of video memory, even though 512K is on the board. What's wrong?
- A. Nothing is wrong. System utility programs are designed to detect only the IBM VGA Standard amount of video memory (256K).
- Q. I'm having trouble getting the Windows 3.0 drivers to work properly. What should I do?
- A. Windows 3.0 can be configuration sensitive. here are some tips:
1. Install the standard VGA driver (comes with the Windows program) first. Make sure everything is working correctly before you try and install a high resolution driver.
  2. Minimize the number of TSRs in your system.

3. Add the following commands to the Enhanced mode portion of the Windows SYSTEM.INI file:

Virtual HDIRQ=OFF

EMMexcludeA000DFFF

4. Do not use SHARE or APPEND commands in your CONFIG.SYS or AUTOEXEC.BAT files.

Q. My display is not correct when I run VPIC or RIX. What's wrong?

A. The first thing to check is the software version. VPIC must be version 2.3 or later. RIX must be version 1.3 or later. If you are using VPIC, you will also need to run the MAMODE.EXE utility. This utility allows you to change the memory addressing scheme from the default 64K scheme to a 1 28K scheme. To run the utility just place Driver & Utility Disk #1 in drive A and type MAMODE. The utility will tell you which memory address scheme the graphics adapter is currently using. To change the current scheme, just press [Enter]

### **4-3 If You Need Technical Assistance**

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To help us answer your questions, please have the following information handy when you call:

1. **Serial number** of your adapter.
2. **System information.** What PC are you using? What peripherals do you have in your system? What kind of monitor are you using? How much **RAM** is your system configured for?
3. What **version operating system(s)** are you running?
4. What **version software package** are you using?
5. What are your **jumper and switch settings** on the adapter? What is the BIOS version? What version of Driver & Utility Disks?
6. What is the **problem**? What seems to cause the problem to occur?

# Appendix

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- A.2 Conversion Table: 9-to-15 Pin
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- A.4 Sync and Polarity Specifications

### Appendix B: Checking Your ROM BIOS: The BIC.EXE Program

### Appendix C: DRAM Upgrades

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### Appendix E: FCC Compliance Statement

## Appendix A. Pinout and Sync Frequencies

### A-1 Analog Color Display Pinouts

Table 2 shows the VGA Graphics Adapter analog color display pinouts.

TABLE 2. Analog Color Display Pinouts

Pin	Function
1	Red Video <sup>1</sup>
2	Green Video <sup>1</sup>
3	Blue Video <sup>1</sup>
4	Not Used
5	Ground
6	Red Return (ground)
7	Green Return (ground)
8	Blue Return (ground)
9	Key (no pin)
10	Sync Return (ground)
11	Monitor ID (not used)
12	Monitor ID <sup>2</sup>
13	Horizontal Sync
14	Vertical Sync
15	Not Used

<sup>1</sup> Analog monochrome-type monitors use green video for all video input and ignore red video and blue video

<sup>2</sup> Monochrome monitors connect Pin 12 to ground. Color monitors leave Pin 12 open. The adapter uses Pin 12 to detect the monitor type.

### A-2 Conversion Table: 9-to-15 Pin

If you will be using a 9-to-15 pin adapter cable to link your 9-pin monitor connector to the 15-pin connector, check Table 13 carefully before you install the cable. 9-to-15 pin adapter cables are available from a variety of sources, but they need to match the specifications in Table 3 in order to work properly with your new adapter.



The adapter requires a D-shaped 9-pin female connector and a D-shaped 15-pin male connector.

TABLE 3. 9-to-15 Pin Conversion Table

9-Pin Connector Signal	Pin	15-Pin Connector Signal	Pin
Red	1	Red	1
Green	2	Green	2
Blue	3	Blue	3
Horz Sync	4	Horz Sync	13
Vert Sync	5	Vert Sync	14
Red Ground	6	Return Red	6
Green Ground	7	Return Green	7
Blue Ground	8	Return Blue	8
Sync Ground	9	Digital Ground	10
		Ground	5

### A-3 Video Signals

Analog:

Black Level = 0V

Full Intensity Level = +0.7V

### A-4 Sync and Polarity Specifications

Table 4 lists the horizontal sync, vertical sync, and polarity for all available VGA modes. If you are not sure if your monitor will support a particular mode, check your monitor's specification for horizontal sync, vertical sync, and polarity against these tables.

TABLE 4. Sync and Polarity Specifications

Mode (h)	Clock	Horz Sync (KHz)	Vert Sync (Hz)	Polarity (H, V)
0,1	25.175	31.4	70	+,-
2,3	25.175	31.4	70	+,-
0 <sup>1</sup> ,1 <sup>1</sup>	25.175	31.4	70	-,+
2 <sup>1</sup> ,3 <sup>1</sup>	25.175	31.4	70	-,+
0 <sup>2</sup> ,1 <sup>2</sup>	28.322	31.4	70	+,-
2 <sup>2</sup> ,3 <sup>2</sup>	28.322	31.4	70	+,-
4,5	25.175	31.4	70	+,-
6	25.175	31.4	70	+,-
7	28.322	31.4	70	+,+
7 +	28.322	31.5	70	+,+
D	25.175	31.4	70	+,-
E	25.175	31.4	70	+,-
F	25.175	31.4	70	-,+
10	25.175	31.4	70	-,+
11	25.175	31.4	60	-,-
12	25.175	31.4	60	-,-
13	25.175	31.4	70	+,-
50	25.175	31.5	60	-,-
51	25.175	31.5	60	-,-
52	25.175	31.5	60	-,-
53	40.000	31.2	70	-,+
54	40.000	31.2	60	-,-
55	40.000	31.2	60	-,-
56	40.000	31.2	60	-,-
57	44.900	31.2	60	-,+
58	44.900	31.2	60	-,-
59	44.900	31.2	60	-,-
5A	44.900	31.2	60	-,-
5B	36.000	35.2	56	-,-
5B <sup>6</sup>	50.350	48.0	72	+,+
5C <sup>3</sup>	50.350	31.5	70	+,-
5D <sup>3</sup>	50.350	31.5	60	-,-
5E <sup>3,5,7</sup>	57.272	29.5	90	+,+
5E <sup>1,5</sup>	72.000	35.2	56	+,+
5F <sup>3,3</sup>	44.900	35.5	86	+,+
5F <sup>1,5,6</sup>	65.000	48.7	60	+,+
5F <sup>1,5,7</sup>	75.000	56.4	70	+,+
60 <sup>3</sup>	44.900	35.5	86	+,+
61 <sup>3</sup>	44.900	37.9	70	+,+

## Table Notes:

- 1 EGA text modes with 8x 14 and 9x 14 character sizes and 350 lines vertical resolution.
- 2 VGA text modes with 9 x 16 character size and 400 lines vertical resolution.
- 3 Interlaced mode (Jumper J2 connected).
- 4 Non-interlaced mode (Jumper J2(1ot connected).
- 5 Supported by 4DRAM configuration only.
- 6 High refresh monitor required with horizontal frequency greater than 48KHz.
- 7 Portrait monitor.
- 8 High refresh monitor required with horizontal frequency greater than 56 KHz.

## Appendix B.

### Checking Your ROM BIOS; The BIC.EXE Program

You will need to read this appendix only if you have an early model PC, PC/XT or compatible. If this is the case, you will need to run the BIC.EXE program on your Driver & Utility Diskette to check the ROM BIOS version of your computer before you install the adapter. The BIC.EXE program will tell you the version date for your systems's ROM BIOS.

BIC.EXE provides the date and version number of your video BIOS for reference. To run BIC.EXE:

1. Boot up your system.
2. Insert Driver & Utility Disk #1 into your floppy disk drive.
3. Go to directory A:\TVGAUTIL, type:  
BIC [Enter]
4. The BIC.EXE program will display the following information:

**The System BIOS date is:**  
XX/XX/XX

**The Video BIOS information:**

**Date:** XXIXXIXX

**Version:** XX/XXIXX

**OEM Code:** X

If your ROM BIOS shows a date earlier than October 27, 1982, you will need to replace your system ROM BIOS to work with the adapter. Earlier versions of the ROM BIOS for computers manufactured in 1981 or 1982 do not support EGA or VGA graphics modes.

## **Appendix C.**

### **DRAM Upgrades**

---

The VGA adapter can be configured with two, or four pieces of 256K x 4 Fast Page Mode DRAM.

Upgrading from two to four DRAM allows you to display up to 1024 x 768-16 colors. To purchase DRAM, contact your dealer, a local electronics store, or a mail order house (which advertise in publications such as Computer Shopper, PC Magazine, PC World, and BYTE). Order 256K x 4 Fast page Mode DRAM (sometimes called one megabit DRAM).

#### **Upgrading From 256K DRAM to 512K**

1. Place the adapter component side up on a firm, flat, nonstatic surface (avoid wool materials). The gold edge connector should be facing you.
2. Insert the DRAM into the sockets provided on the left-hand corner of the board. The notched side of the DRAM should be facing left. Be careful not to bend any pins. Be sure each DRAM is seated snugly.
3. To check that the DRAM has been installed properly, place the board in your system and turn the system ON. A copyright and the amount of video DRAM detected will appear in the upper left-hand corner of the initial boot screen. If the amount of DRAM detected is 512K, you have installed the DRAM successfully. If the amount of DRAM detected is 256K, remove the adapter from your system. Check to see that all pins fit snugly into their respective

socket holes (i.e., no pins bent underneath the DRAM chip or sticking out).  
Be sure the notches for each DRAM are facing the same way (left).

## **Appendix D.**

### **Additional Sources for Programming Assistance**

---

The information in this manual is intended for quick reference only. If you intend to seriously program VGA software, you should refer to one of the following publications on VGA:

IBM Personal System/2 Display Adapter Technical Reference, April 1987. (IBM part number 68x2251 S68X-2251-0.)

IBM Personal System/2 and Personal Computer BIOS Interface Technical Reference, April 1987. (IBM part number 68 x 2260 S68X-260-00).

## **Appendix E.**

### **FCC Compliance Statement**

---

Certified to comply with the limits for a Class B computing device according to Subpart J or Part 15 of FCC rules. See instructions if interference to radio reception is suspected.

#### **FCC Warning**

This equipment generates and used radio frequency energy and if not installed and used correctly, that is, in strict accordance with the manufacturer's instructions, it may cause interference to radio and television reception.

It has been 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 the FCC Rules, which are designed to provide reasonable

protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause interference with radio or television reception, which can be determined by turning the equipment ODD and ON, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Plug the computer into a different outlet so that the computer and receiver are on different branch circuits.
- Ensure that card slot covers are installed in all unused computer slots.

## FCC Compliance Statement

Certified to comply with the limits for a Class B computing device according to Subpart J of Part 15 of FCC rules. Interference to radio reception is suggested.

### FCC Warning

This equipment generates and uses radio frequency energy and it may interfere with radio reception. If you experience interference, you should stop using the equipment until you have consulted with the manufacturer's instructions to reduce or eliminate the interference.

It has been 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 the FCC Rules, which are designed to provide reasonable

# SOFTWARE

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# 1. Overview

This document is a reference for the Driver/Utility Installation Program.

## TO BEGIN INSTALLATION:

Insert Driver & Utilities Diskette into drive A. From drive A type: **README [Enter]**. Choose whether you would like the contents of the utility disk expanded to C:, D:, or E: drive. Be sure the destination hard drive has at least 2MB of memory available.

Once all files have been copied/expanded to the hard drive, the driver/utility program may be started by typing **README** from the **TVGAUTIL** directory on your selected hard drive. Before starting the TVGA Driver/Utility installation, you will be prompted to install a patch program for the European version of Windows 3.1™. If you have the European character set and keyboard layout for DOS in your system, please follow the instructions on the screen to install this patch module. If you have the standard American character set and keyboard layout for DOS installed in your system, answer "No" before proceeding with the TVGA Driver/Utility installation. (You will be able to install the patch for the European version of Windows 3.1 if needed later by running the **TPATCH** utility found in **\TVGAUTIL\UTILITY** directory).

You will be greeted by a main menu which lists all available utility/driver options. Choose the option you would like to perform (e.g. install AutoCAD drivers) and proceed. The program is menu driven and should require little additional explanation.

## 2. Utilities Installation

### 2.1 Installation Procedures

---

After selecting Utilities, you will be presented with a list of possible utilities to install. Reference section 2.2 for a description of the utilities.

### 2.2 Utilities Summary

---

#### 2.2.1 SVM.EXE

SVM is a menu-driven program designed to help you select and test all video modes available to the adapter. SVM allows you to emulate EGA, CGA, and Hercules (MDA) modes on a VGA monitor. This may be useful when you wish to run a special application (e.g. CGA PINBALL).

You may also use SVM to select the standard VGA text mode (i.e. 80x25) and extended VGA text and graphics modes (i.e. 132x60, 1024x768-256, 640x480-HiC). This provides a useful method to determine if a given video mode will display correctly on your monitor.

Some game programs require you boot up in CGA mode. For these programs, SVM will lock in CGA mode and will remain in CGA mode even if you warm-boot (press [Ctrl]-[Alt]-[Del]). For other modes (EGA, 1024x768-256, etc.), SVM will reset to VGA after you warm-boot. Since most standard programs run in VGA mode, do not forget to switch back to VGA mode before starting a standard application (e.g. Windows 3.x).

**Note:** Some new graphic boards designed around the TVGA9200CXr or TGUI9400CXi will not support CGA or Hercules emulation. If you try to use these modes, you will received a "For old board" message. Please choose some other mode, such as VGA or EGA.

## 2.2.1.1 How To Use SVM

You can run SVM in either of two ways: by calling up the menu and selecting from the menu choices, or by entering the desired mode directly with a specific command line. This section covers both methods.

### How To Use the SVM Menu

1. Go to the directory where you have installed SVM (e.g. C:\TVGAUTIL or C:\TVGAUTIL\UTILITY).
2. Type:

```
SVM [Enter]
```

3. The SVM menu will display the available modes. Use the arrow keys to select the mode you want. Press [Enter] to select the mode. You may preview your selection by pressing F5.

### How to Use SVM Through Command Lines

If you already know what mode you want to select, and you do not want to use the SVM menu, you can type:

```
SVM [Selected Mode] [Enter]
```

Table 1 on the next page shows the some values you can enter in the command line. You may also reference the mode specification table at the bottom of the SVM menu screen.

**TABLE 1. SVM Command Line**

Desired Mode/Feature	Command Line
Switch back to regular VGA 80x25	SVM VGA
Switch to EGA mode	SVM EGA
CGA for DOS game programs	SVM CGA
CGA for stand-alone game programs (games that boot from their own disk)	SVM CGA BOOT
Hercules Monochrome	SVM HERV
80 columns x 30 rows text mode	SVM 80x30
80 columns x 43 rows text mode	SVM 80x43
132 columns x 25 rows text mode	SVM 132x25
132 columns x 43 rows text mode	SVM 132x43
132 columns x 60 rows text mode	SVM 132x60
1024x768-256 color graphics mode	SVM 1024x768-256NI
640x480-32K color graphics mode	SVM 640x480-Hic

### 2.2.1.2 Example: Switching to EGA Mode with SVM Utility

1. Go to the directory on your hard disk where you have installed SVM  
Type:

**SVM [Enter]**

2. Use the Arrow Keys on your keyboard's numeric pad to select EGA,  
and press the [Enter] key to confirm your choice.

You can also switch to EGA mode directly. To do so, type:

**SVM EGA [Enter]**

3. To return to the VGA mode from the EGA mode, type:

**SVM VGA [Enter]**

## 2.2.2 VESA

The VESA BIOS extension is a Terminate and Stay Resident Program (TSR) which acts as an extension to the video BIOS. To run this program type VESA or VESA-F (VESA-F skips inquiry as to whether you wish to add or remove the BIOS extension from system RAM). The VESA BIOS extension will allow users to install and run the VESA drivers supplied with a variety of applications (e.g. AutoCAD 12, Deluxe Paint II Enhanced, Generic CAD v. 3.0 or v. 5.0, Microstation PC v. 4.0, Cadkey v. 4.0, AutoDesk Animator Pro, etc.).

**NOTE:** Most VGA adaptors purchased after 1/1/93 have VESA BIOS Extension program built into the VGA BIOS. Since the VESA BIOS Extension is already built into the VGA BIOS, the VESA TSR program may not be included in your Driver/Utility diskette.

## 2.2.3 SMONITOR

Switches between color and monochrome display. Some monitors (most notably Samsung monitors manufactured before 2/8/91) do not adhere to the standard IBM pinout definitions, which causes the VGA card to boot up in monochrome instead of color. This utility may be used to correct the problem. To run, add the following command to your Autoexec.bat file **SMONITOR C**.

To run from the DOS prompt, just type **SMONITOR** from the directory where you have installed the utilities.

## 2.2.4 TANSI.SYS

TANSI.SYS provides an enhanced ANSI driver for your standard output device. This driver allows you to display more than 25 rows of text on your standard screen. If you already have an ANSI driver installed and are unable to display more than 25 rows of text, you might want to replace your ANSI driver with TANSI.SYS. TANSI.SYS supports up to DOS version 6.0. If your TVGA Driver/Utility is installed in the D: drive, you will need to copy it to the C: drive first. To copy and install TANSI.SYS, from D: Driver type:

**Copy D:\TVGAUTIL\UTILITY\TANSI.SYS C:\**

Use any ASCII text editor to add the following line to your Config.sys file:

**Device = C:\TANSI.SYS**

or modify the Device=C:\ANSI.SYS line with the above line.

Re-boot the system after the Config.sys has been modified.

## **2.2.5 TVGACRTC**

The TVGACRTC program allows you to adjust video display parameters so that images will be optimally sized and centered on the screen. Adjustable parameters include horizontal size and position, vertical size and position, and pixel frequency. A list of monitors with pre-programmed CRTC parameters is provided. If your monitor is not listed, you will need to create your own entry.

The program also allows you to configure the adapter's decode method (Fast or Slow Address Decode) and BIOS and Video I/O data width (8 or 16-bit). These configuration settings override the hardware jumper settings.

To start the program from the DOS prompt, just type TVGACRTC from the C:\TVGAUTIL\UTILITY directory on your hard drive. To access the extra feature configuration screen, press F10 from the main TVGACRTC menu screen.

## **2.2.6 TPATCH**

The TPATCH provides several patch files to correct screen display problems. TPATCH corrects the display problems for the European Windows 3.1 Standard VGA, Print Preview function of WordPerfect 5.1, File Import/Export function of Applause 1.5, IBM 3270 Emulation, Grasp 4.0, PICEM 1.0, Windows 3.1 SKD, and EZ-Menu. To run, just type TPATCH at the DOS prompt. The TPATCH displays a list of patch files. Just select the patch you need and provide the directory of your application software. TPATCH will modify the display driver provided by your application software.

## 3. Driver Installation

After selecting Drivers from the Main Menu, you will be presented with a list of possible drivers to install. Select the desired driver you wish to install. You will be presented with a version list for the given application. Choose the appropriate version of the application. Once you have selected the desired driver, the installation program will either provide you with further instructions, or guide you through the installation. The following pages give details for installing each available driver.

### 3.1 AutoCAD, Autoshade

#### 3.1.1 AutoCAD Release 9 and 10 (ADI Driver)

1. You will be prompted if you wish to install drivers for both AutoCAD and Autoshade, or just AutoCAD. If you choose to install both AutoCAD and Autoshade, please refer to section 3.1.1.1 after completing the installation procedures in section 3.1.1.
2. Select the version of AutoCAD you have installed on your hard drive. When you select a version of AutoCAD, the program will prompt you for the directory to which you want to load the drivers. C:\ACAD is the default directory. Enter the directory you plan to use if it is different from the default directory.

TABLE 2. ADI Drivers on the Driver & Utility Diskettes

ADI Version <sup>1</sup>	Resolution/ Colors	Monitor Options	DRAM Required
ADI V3.x/V4.x	800x600-16	Single/dual	256K
ADI V3.x/V4.x	1024x768-16	Single/dual	512K
ADI V3.x/V4.x	640x480-256	Single/dual	512K
ADI V3.x/V4.x	800x600-256	Single/dual	512K
ADI V3.x/V4.x	1024x768-256	Single/dual	1MB

<sup>1</sup> Same driver used for ADI V3.X and ADI V4.X



3. Select a display driver from the menu. When you select a driver, the correct files will load automatically into your AutoCAD directory. If you are not installing an Autoshade driver, please skip to step 5.
4. If you have chosen to install AutoCAD and Autoshade, you will be prompted to select a Rendering Device Driver for Autoshade. Your options are 640x480-256 colors, 800x600-256 colors (512K DRAM required) or 1024x768-256 colors (1MB DRAM required). When you select a driver, the correct files will automatically load into your Autoshade directory.
5. Enter the ADI interrupt vector you wish to use. The default value is 7A. If you are using a system with a LAN network card installed (e.g. Novell), you may need to select an interrupt value other than the default value (i.e. 7B, 7C, 7D). If so, be sure to use the same interrupt value for all AutoDesk programs (AutoCAD, AutoShade, etc.)
6. Select Normal or Black background. For details on background color, please reference **Special Options for Releases 9 and 10** below.
7. Select Dual Screen or Single Screen mode (Y-Dual Screen mode, N-Single Screen mode). For details on dual-screen or single-screen modes, please reference **Special Options for Releases 9 and 10** below.
8. The remaining steps need to be completed inside AutoCAD. They are listed in a text window. You may note them down or reference steps 9 through 11.
9. Exit the Driver/Utility Installation program.
10. Start AutoCAD and bring up the configure AutoCAD menu. Reconfigure the video display by selecting ADI display Vx.x.
11. To load the driver: exit AutoCAD, reboot your system, and enter DSVGA on the command line. When you start AutoCAD, the graphics display will be at the resolution you selected.

**NOTE:** Please consult your AutoCAD Users Guide for additional information on driver installation.

## Special Options for Releases 9 and 10

### Dual Monitor Support

The drivers for Releases 9 and 10 offer special options. In your AutoCAD manual, you will notice that AutoCAD offers support for both single and dual monitors. For the dual monitor feature, use a monochrome card and monitor in combination with your VGA adapter and graphics monitor. In this mode, AutoCAD displays text menu information on the monochrome monitor and the drawing on the graphics monitor. In the standard configuration, use a function key to flip between the text and graphics screens.

### Background Color

The AutoCAD drivers will support both white and black backgrounds on the graphics screen. Entering DSVGA initializes the background selected during the installation procedure.

### 3.1.1.1 Autoshade 1.1

The Autoshade driver is installed along with an AutoCAD ADI driver. You will, however, need to configure the Autoshade program for the newly installed Autoshade Driver. This may be accomplished as follows:

1. From DOS, enter the directory where Autoshade is stored (i.e. C:\SHADE). Type:

**SHADE** ; if you are configuring Autoshade for the first time, or

**SHADE -R** ; if you have previously configured Autoshade.

2. Configure Autoshade as follows:

- a. Select **Option 1** (Autodesk Interface Display Driver) for the Interactive Display Device, and **Option 1** (Autodesk Interface Rendering Driver) for the Rendering Display Device.

- b. Enter **"Y"** for "Do the display and rendering devices share a single screen?" and "Does the FLIPSCREEN require a

redraw?"

3. To use the Autoshade driver along with AutoCAD/386 protected mode drivers, type **DSVGAR -F** before entering Autoshade. This switch will install only the Autoshade rendering driver and not the AutoCAD ADI driver.

### 3.1.2 AutoCAD/386 Release 10 and 11 (PDI Driver)

1. To install the drivers for AutoCAD/386, release 10 and 11, you will need to copy the display driver from the `\TVGAUTIL\ACAD386` directory on your hard drive to your AutoCAD/386 directory. For example, if your AutoCAD/386 directory is in your C: drive, and the driver/utility is installed in your D: drive type:

**Copy D:\TVGAUTIL\ACAD386\RCPTVGA.EXP C:\ACAD386**

The display drivers (RCPTVGA.EXP) will be copied to your AutoCAD/386 directory (e.g. C:\ACAD386).

2. The command `SET DSPADI = RCPTVGA` must now be added to your Autoexec.bat file. Use any ASCII text editor (e.g. DOS 5.0 EDIT.EXE command) to modify the Autoexec.bat file in the root directory of your boot disk drive. Re-boot your system after the Autoexec.bat file has been modified.
3. The remaining steps need to be completed inside AutoCAD. They are listed in a text window. You may note them down or reference steps 5 through 8.
4. Run ACAD.EXE from the AutoCAD/386 directory.
5. Select in order, **Configure AutoCAD, Configure Video Display and ADI P386 Display.**
6. Choose one of the graphics drivers.
7. A number of prompts follow which allow you to select the graphics area background color, text color (for the menu, status line, and com-

mand prompt areas of the screen), text background color, border color, and dialogue box/button outline color. To select the default colors, press [Return] at each prompt. To select a different color, enter the appropriate color number at the given prompt.

**NOTE:** For 16-color modes, you can only select black or white for graphics background color.

The color numbering scheme for 16-color modes (15 colors plus black) is:

- |               |                            |
|---------------|----------------------------|
| 1 - Red       | 9 - Low intensity red      |
| 2 - Yellow    | 10 - Low intensity yellow  |
| 3 - Green     | 11 - Low intensity green   |
| 4 - Cyan      | 12 - Low intensity cyan    |
| 5 - Blue      | 13 - Low intensity blue    |
| 6 - Magenta   | 14 - Low intensity magenta |
| 7 - White     | 15 - Light grey            |
| 8 - Dark grey |                            |

The color numbering scheme for 256 color modes matches that defined in the AutoCAD/386 Installation and Performance Guide for IBM's 8514 Adapter.

Refer to the IBM Video Graphics Array Video Display Option in Autodesk's Installation and Performance Guide for more detailed information on the color select prompts for 16 color and 256 color modes.

8. You have completed the driver installation for AutoCAD/386. If you need to reconfigure for a different resolution, repeat steps 5 through 7, then run AutoCAD as usual.

### 3.1.3 AutoCAD 12

There are two options for AutoCAD 12 display drivers. You can either use the VESA driver that comes with AutoCAD 12 or the AutoCAD 12 driver that is on your Driver/Utility diskette.

#### Option 1: Using the VESA driver

AutoCAD 12 supports VESA (Video Electronic Standard Associate) driver. If your adaptor is equipped with a VGA BIOS that is version C3.0 or later, you can just select VESA driver from the ACAD Configuration Option. If your VGA card is equipped with an earlier version of BIOS, you can load a TSR program called VESA.EXE (please refer to Section 2.2.2) prior to executing ACAD 12 and select VESA driver from the ACAD Configuration Option.

#### Option 2: Using the AutoCAD 12 driver from the Driver/Utility diskette

Complete the following steps to install the AutoCAD 12 driver from your Driver/Utility diskette:

1. Install AutoCAD 12 with the IBM Standard VGA driver, and make sure you can bring up the AutoCAD 12 Drawing Editor Screen.
2. You will need to copy the AutoCAD12 display driver from the \TVGAUTIL\ACAD12 directory on your hard drive to your AutoCAD12 driver directory. For example, if your AutoCAD12 directory is in your C: drive, and the driver/utility is installed in your D: drive type:

**Copy D: \TVGAUTIL\ACAD12\RCPTV42.EXP C: \ACAD12\DRV**

The display drivers (RCPTV42.EXP) will be copied automatically to your AutoCAD 12 driver directory.

3. Use any ASCII text editor (e.g. DOS 5.0 EDIT.EXE command) to add the following command to your Autoexec.bat file:

```
SET ACADDRV=\ACAD\DRV
```

Re-boot your system after the autoexe.bat file has been modified.

4. The following steps need to be completed within AutoCAD 12.
  - a: Reboot your system and bring up AutoCAD 12 Drawing Editor Screen with the IBM Standard VGA Driver.
  - b: Select "Configure" from the "File" pull-down menu. AutoCAD 12 will switch to a text screen.
  - c: Select Option 3 to "Configure Video Display"
  - d: Select "Trident VGA P386 ADI (v 4.2) Display and Rendering Driver".
  - e: Type "Y" to select a display resolution. Select the desired resolution. **NOTE:** Be sure that your adaptor has the required DRAM necessary to support the selected resolution. Please refer to the hardware manual for information regarding DRAM requirements.
  - f: AutoCAD 12 will display prompts to allow you to adjust the color settings. To select the default settings, hit <Return>. To select a different ADI 4.2 display function, please refer to your AutoCAD User's Reference Manual.
  - g: Type "0" to exit the Drawing Editor Screen.
  - h: Type "Y" to save the configuration settings.

*To install display drivers for AutoCAD 12 Rendering*

Complete the following steps within AutoCAD 12 to install the display driver for rendering:

1. Make sure you have installed Rendering for AutoCAD 12.
2. In the Drawing Editor screen, select "Preferences" from the "Render" menu.
3. If you have previously configured Preferences for Rendering, select "Reconfigure" from the Rendering Preferences menu. Otherwise, AutoCAD 12 will switch directly to a

text screen.

4. Select Option 2 to "Configure Rendering Device"
5. Select "AutoCAD's P386 ADI Combined Display/Rendering Device".
6. Select your resolution preference for rendering.
7. Select your Rendering View Preference.
8. Type "0" to exit the Drawing Editor Screen.
9. Type "Y" to save the configuration settings.
10. Click "OK" to close Rendering Preferences menu.

### 3.1.4 Autoshade 2.0 and 3D Studio

1. AutoCAD/386 drivers can also be used with Autoshade 2.0 and 3D Studio. Please refer to section 3.1.2 for instructions on copying the AutoCAD/386 display driver (RCPTVGA.EXP) to your Autoshade 2.0 or 3D Studio.
2. For Autoshade 2.0 the following set commands must be added to your Autoexec.bat file:

```
SET DSPADI = RCPTVGA
```

```
SET RDPADI = RCPTVGA
```

For 3D Studio the following set command must be added:

```
SET RCPADI = (3D Studio Directory)\RCPTVGA.EXP
```

Use any ASCII text editor (e.g. EDIT.EXE command) to modify the Autoexec.bat.

3. Consult your Autoshade 2.0 and 3D Studio manuals for additional information on how to configure these programs for high resolution drivers.

### 3.1.5 AutoDesk Animator Pro

AutoDesk Animator Pro supports VESA (Video Electronic Standard Associate) driver. If your adaptor is equipped with a VGA BIOS that is version C3.0 or later, you can select VESA driver from the Animator Pro video configuration option. If your VGA card is equipped with an earlier version of BIOS, you can load a TSR program called VESA.EXE prior to executing Animator Pro and select VESA driver from the Animator Pro video configuration option. Please see section 2.2.2 for more information on VESA BIOS Extension.

### 3.1.4 AutoCAD 2.0 and 3D Studio

1. AutoCAD86 driver can also be used with AutoCAD 2.0 and 3D Studio. Please refer to section 2.1.3 for instructions on copying the AutoCAD86 display driver (RCPTVGA.EXP) to your AutoCAD 2.0 or 3D Studio.
2. For AutoCAD 2.0 the following set commands must be added to your AutoCAD file:  

```
SET RSPADI = RCPTVGA  
SET RHPADI = RCPTVGA
```
3. For 3D Studio the following set command must be added:  

```
SET RCPADI = (3D Studio Directory)/RCPTVGA.EXP
```

Use any ASCII text editor (e.g. EDITEXE command) to modify the AutoCAD file.  
3. Consult your AutoCAD 2.0 and 3D Studio manuals for additional information on how to configure these programs for high resolution driver.



## 3.2 Lotus 1-2-3 2.1 and 2.2

1. Copy the Lotus 1-2-3 driver into your Lotus directory by running SET123 from your \TVGUTIL directory. For example, if the driver/utility is installed in the D: drive and Lotus 1-2-3 is installed in the C: drive with directory name \LOTUS, type:

**D:\TVGAUTIL\SET123 C:\LOTUS**

2. Change to your LOTUS 1-2-3 directory and type: **LOTUS** to open the main menu.
3. Select **Install** from the main menu.
4. Select **Advanced options** from the Install menu.
5. Select **Add new driver to library** from the Advanced Options menu.
6. Select **Modify current driver set** from the menu.
7. Select either **text** or **graphics display**. For the text mode, choose one of the following command lines to indicate the number of rows for your display:

<b>TVGA 132x25 Version x.x</b>	<b>TVGA 80x30 Version x.x</b>
<b>TVGA 132x30 Version x.x</b>	<b>TVGA 80x43 Version x.x</b>
<b>TVGA 132x43 Version x.x</b>	<b>TVGA 80x60 Version x.x</b>
<b>TVGA 132x60 Version x.x</b>	

(Example: enter TVGA 132x25 Version 1.0 for 132 column by 25 row display. You can enter any of the following values for rows: 25, 30, 43, or 60).

For graphics mode, select the following command line:  
**TVGA 640x480 for Release 2.x**

8. Return to the Lotus 1-2-3 main menu and choose **Save Change** to record the changes you have made, then exit the Lotus 1-2-3 installation program.

9. You have completed driver installation for Lotus 1-2-3. If you need to reconfigure for a different resolution (i.e., 132x25 to 132x30 in text mode), just follow steps 3 through 8, then run Lotus 1-2-3 as usual.

## 3.3 Symphony 2.x

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1. Copy the Symphony driver to your \SYMPHONY directory by running the SETSYMPH utility found in the \TVGAUTIL directory. For example, if the driver/utility is installed in the D: drive and the Symphony application is installed in the C: drive with a directory name \SYMPHONY, type:

**D: \TVGAUTIL\SETSYMPH          C: \SYMPHONY**

2. The remaining steps need to be completed inside Symphony. You may note them down or reference steps 4 through 9.
3. Change to the Symphony 2.x directory and type: **SYMPHONY** to open the main menu.
4. Select **Install** from the main menu.
5. Select **Advanced options** from the Install menu.
6. Select **Add New Driver To Library** from Advanced Options menu.
7. Select **Modify Current Driver Set** from the menu.
8. Select either **text** or **graphics** display. For the text mode, choose one of the following command lines to indicate the number of rows for your display:

**TVGA 132x25 Version x.x    TVGA 80x30 Version x.x**  
**TVGA 132x30 Version x.x    TVGA 80x43 Version x.x**  
**TVGA 132x43 Version x.x    TVGA 80x60 Version x.x**  
**TVGA 132x60 Version x.x**

(Example: enter TVGA 132x25 Version 1.0 for 132-column by 25-row display. You can enter any of the following values for rows: 25, 30, 43, or 60).

For graphics mode, select the following command line:

**TVGA 640x480 for Release 2.x**

9. Return to the Symphony main menu and choose **Save Changes** to record the changes you have made, then exit the Symphony installation program.

10. You have completed driver installation for Symphony. If you need to reconfigure for a different resolution, (i.e. 132x25 to 132x30 in text mode), follow Steps 4 through 9, then run Symphony as usual.

## 3.4 GEM Desktop 3.xx

1. You will be prompted to prepare a GEM/3 driver diskette. The installation program will copy driver files to the newly formatted diskette in drive A.
2. The remaining steps need to be completed inside GEM. They are listed in a text window. You may note them down or reference steps 3 through 7.
3. Insert original GEM/3 system Master Disk, and run "GEMSETUP".
4. Select in order: **Change Existing Configuration, Continue, Change Your Current Setup**, and the listed graphics and card display.
5. When you are prompted to choose a new graphics card and display, select **Other Pack** and insert the newly prepared GEM/3 driver diskette in drive A.
6. Select a display driver.
7. Continue with the rest of the GEMSETUP program. Please consult your GEM manual for more info on the GEMSETUP program.

## 3.5 Ventura Publisher

1. You will be prompted to prepare a Ventura driver diskette. The installation program will copy driver files to the newly formatted diskette in drive A.
2. You will be asked to give the location of the Ventura directory on your hard disk (e.g. C:\VP). Enter the path and then select OK.
3. Indicate whether or not you are using the Ventura Publisher Professional Extension.
4. Select one of the display modes listed.
5. Indicate the type of mouse you are using and, if necessary, to which I/O port (i.e. COM1, COM2, etc.) the mouse is connected.
6. Confirm your choices to complete the installation.

If you want to reconfigure for a different display mode, you will need to repeat this entire installation procedure.

## 3.6 WordPerfect

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### 3.6.1 WordPerfect 5.1

#### *To install the text mode drivers*

1. You will need to copy the driver files from \TVGAUTIL\WP51 directory on your hard disk drive into your WordPerfect 5.1 directory (e.g. C:\WP51). For example, if your WordPerfect 5.1 is installed in drive C: and the driver\utility is installed in driver D:, type:

**Copy D:\TVGAUTIL\WP51\TVGATEXT.VRS C:\WP51**

The display drivers (TVGATEXT.VRS) will be automatically copied to the WordPerfect directory.

2. The remaining steps need to be completed inside WordPerfect. They are listed in a text window. You may note them down or reference steps 3 through 5.
3. Run WordPerfect 5.1 by typing WP at the WordPerfect 5.1 program directory.
4. Press Shift-F1 to bring up the Setup Menu. Press "2" to select **Display** and then "3" to select **Text Screen Type**.
5. Choose one of the extended text drivers. The available drivers are 80x30, 80x43, 80x60, 132x30, 132x43, 132x60.
6. You have completed driver installation for WordPerfect. If you need to reconfigure for a different resolution, (i.e. 132x25 to 132x30 in text mode), just repeat steps 4 and 5.

#### *To install extended graphics mode drivers*

1. You will need to copy the driver files from \TVGAUTIL\WP51 directory on your hard disk drive into your WordPerfect 5.1 directory (e.g. C:\WP51). For example, if your WordPerfect 5.1 is installed in

drive C: and the driver\utility is installed in driver D:, type:

**Copy D:\TVGAUTIL\WP51\TVGA16.VRS C:\WP51**

The display drivers (TVGA16.VRS) will be automatically copied to the WordPerfect directory.

2. The remaining steps need to be completed inside WordPerfect. They are listed in a text window. You may note them down or reference steps 3 through 5.
3. Run WordPerfect 5.1 by typing WP at the WordPerfect 5.1 program directory.
4. Press the Shift-F1 to bring up the Setup Menu. Press "2" to select Display and the "2" to select Graphics Screen Type.
5. Choose one of the Extended Graphic drivers. The available drivers are 800x600-16 colors, 1024x768-16 colors, and 768x10216 colors.
6. You have completed driver installation for WordPerfect. If you need to reconfigure for a different resolution, (i.e. 800x600), just repeat steps 4 and 5.

### 3.6.2 WordPerfect 6.0

#### *To install the text mode drivers*

1. You will need to copy the driver file from \TVGAUTIL\WP60 directory on your hard driver into your WordPerfect 6.0 directory (e.g. \WP6.0). For example, if your WordPerfect 6.0 application is installed in drive C: and the driver/utility program is installed in drive D:, type:

**Copy D:\TVGAUTIL\WP60\TVGA6TXT.VRS C:\WP60**

2. To run WordPerfect 6.0 from the directory, type: WP
3. Make sure you are in WordPerfect 6.0 Text Mode. There should be a check mark or asterisk in front of "Text Mode" under the View pull-down menu.



4. Select the "Setup" option under the File pull-down menu, and chose Display. Select "2. Text Mode Screen Type/Colors" and then select "Screen Type". To install the Trident driver, select "Trident VGA". Select the appropriate screen resolution.

#### To install extended graphics mode drivers

WordPerfect 6.0 for DOS allows you to select Text Mode or Graphic Mode Interface. For graphic mode, you can install the VESA driver and select a resolution from 640x480 to 1024x768.

1. If the VGA BIOS on your card is version C3.0 or later, you can select the VESA driver that is included in the WordPerfect 6.0 program. If the VGA BIOS is a version earlier than C3.0, you will need to run the VESA.EXE utility program located on your VGA Driver/Utility diskette. Please see section 2.2.2 for more information on VESA BIOS Extension.
2. Make sure you have selected and installed the VESA driver from WP6.0 installation program. Boot-up the WordPerfect 6.0 program, and select "Graphic Mode" from the View pull-down menu.
3. Select "Setup" from the "File" pull-down menu. Select "Display", and choose "1" to select the different graphic mode driver. Choose "1" for Screen Type. Highlight "VESA VBE", and select the desired resolution. Follow the instructions on the screen to complete installation.

## **3.7 Microsoft Word for DOS**

---

### **3.7.1 MS Word 5.0**

1. You will need to copy the MS Word driver from the \TVGAUTIL\Word directory on your hard drive into your MS Word 5.0 directory (e.g.\Word50). For example, if your MS Word 5.0 is installed in drive C: and the Driver/Utility is installed in drive D:, type:

**Copy D:\TVGAUTIL\WORD\SCREEN.VID C:\WORD50**

The display drivers (SCREEN.VID) will be automatically copied to the Word directory.

2. The remaining steps need to be completed inside MS Word. They are listed in a text window. You may note them down or reference steps 3 through 5.
3. Run MS Word 5.0 by typing "WORD" at your MS Word 5.0 directory.
4. Press ESC to enter a command. Press "O" to enter an Option Command.
5. Select **Display Mode**, then press F1 to list the display modes available. Choose one of the following lines to indicate the number of rows for your display:
  - (1) Text, 25 lines, 16 color
  - (2) Text, 43 lines, 16 color
  - (3) Text, 50 lines, 16 color
  - (4) Text, 60 lines, 16 color
  - (5) Text, 25 lines, 16 color<sup>1</sup>
  - (6) Text, 30 lines, 16 color<sup>1</sup>
  - (7) Text, 43 lines, 16 color<sup>1</sup>
  - (8) Text, 60 lines, 16 color<sup>1</sup>

<sup>1</sup> Lines 5 through 8 are for 132 column modes. Mouse support is not available for 132 column modes.

6. You have completed driver installation for MS Word. If you need to reconfigure for a different resolution, (i.e.132x25), just repeat steps 4 and 5.

### 3.7.2 MS Word 5.5

1. Change the directory to \TVGAUTIL\Word55.
2. Type **SETUP** to run the setup program. Follow the instructions on the screen to complete the driver installation.

## **3.8 Microsoft Windows**

---

### **3.8.1 Microsoft Windows 3.1**

Drivers for MS Windows 3.1 can be installed using the Graphical Installation Interface. This interface is a menu-driven procedure to provide for maximum ease and convenient installation.

If you have already installed the drivers using TINSTALL.EXE, skip steps 1-5, and go to step-6.

1. It will be assumed at this point that you have already installed Microsoft Windows 3.1 using the standard IBM VGA driver and that it is working properly. If haven't installed Windows 3.1, exit the Installation Program and complete the Microsoft Windows installation.
2. Run Windows 3.1 to display the program manager window.
3. Insert the Trident Driver\Utility Diskette into your floppy disk drive (e.g. A:).
4. Select FILE MANAGER at the main window, and specify the floppy drive location of the Trident Driver\Utility Diskette.
5. Select the TINSTALL.EXE file in the \WIN directory of your floppy drive to begin installation. TINSTALL.EXE will automatically install all driver files to a subdirectory named TRIDENT on your hard disk. All related font files will be installed to the \Windows\system directory. A Windows Group named Display Driver & Utility, which includes Driver Setup, Uninstall, and Power Management (for certain video controller boards) icons, will be created.
6. Click on "Driver Setup" icon, then highlight the TVGA Driver/ Utility and click on "Select". Select the suitable Trident driver from the menu and click on SETUP. Follow the instructions on the screen to complete the driver installation.

## **To install Power Management Feature**

For certain video controller boards (e.g. TGUI9400CXi or TGUI9420DGi), after the installing the drivers, you will see another program called **Power Management** in the Display Driver & Utility window. Power Management is designed for energy saving monitors which match the VESA Display Power Management Signaling (DPMS) standard. If your monitor meets the VESA DPMS specification, you may use the Power Management feature to decrease the amount of energy used by your monitor.

**CAUTION:** If your monitor does not support the VESA DPMS standard, it may not synchronize well when using the Power Management feature. If you have these synchronization problems, please disable the Power Management feature.

### **3.8.2 Microsoft Windows NT**

1. Bootup from DOS operation system.
2. Assume your Windows NT is installed in C:\WINNT. If your Windows NT is installed in a different drive or directory, just replaced the C:\WINNT with the appropriate drive letter and directory.
3. Type "NTINSTL C:\WINNT" from your C:\TVGAUTIL\NTDRV directory, and press [Enter]. The NTINSTL.BAT will:
  - (a). Rename C:\WINNT\SYSTEM32\DRIVERS\VGA.SYS to C:\WINNT\SYSTEM32\DRIVERS\VGA.OLD
  - (b). Copy TRIDENT.SYS to C:\WINNT\SYSTEM32\DRIVERS\VGA.SYS
  - (c). Copy TRIDENT.SYS to C:\WINNT\SYSTEM32\DRIVERS\TRIDENT.SYS
  - (d). Copy VIDEO.INF to C:\WINNT\SYSTEM32\VIDEO.INF
4. Change the directory to Windows NT directory and run Windows NT

## SETUP.

5. Select the resolution and color.
6. When Messages Box asks "Do you want to use the currently installed driver(s) or install new one(s)", choose "Current".
7. Exit Windows NT SETUP.

## 3.9 Quattro Pro 2.x for DOS

1. You will need to copy the Quattro Pro driver from the \TVGAUTIL\PRO directory on your hard drive into your QPRO 2.x for DOS directory. For example, if your Quattro Pro 2.x is installed in drive C: and the Driver/Utility is installed in drive D:, type:

**COPY D:\TVGAUTIL\QPRO\VIDEO.RSC C:\QPRO**

The display drivers (VIDEO.RSC) will be automatically copied to the Quattro Pro directory.

2. The remaining steps need to be completed inside Quattro Pro. They are listed in a text window. You may note them down or reference steps 3 through 5.
3. Choose to run Q.EXE by entering "Y" in response to the prompt. The Driver/Utility Installation program will then exit to Quattro Pro.
4. Press "O" to select the Options menu and "D" to select Display Mode.
5. Choose an extended text mode.
6. You have completed the graphic driver installation for Quattro Pro. If you need to reconfigure for a different resolution, (i.e. 800x600), just repeat steps 4 and 5.

## 3.9 Quattro Pro 2.x for DOS

1. You will need to copy the Quattro Pro driver from the TVGAUTIL/PRO directory on your hard drive into your QPRO 2.x for DOS directory. For example, if your Quattro Pro 2.x is installed in drive C: and the DivertUtility is installed in drive D:, type:  

```
COPY D:\TVGAUTIL\QPRO\VIDEO.VRSC C:\QPRO
```

The display driver (VIDEO.VRSC) will be automatically copied to the Quattro Pro directory.
2. The remaining steps need to be completed inside Quattro Pro. They are listed in a text window. You may note them down or refer to steps 3 through 5.
3. Choose to run QEXE by entering "Y" in response to the prompt. The DivertUtility installation program will then exit to Quattro Pro.
4. Press "O" to select the Options menu and "D" to select Display Mode.
5. Choose an extended text mode.
6. You have completed the graphic driver installation for Quattro Pro. If you need to reconfigure for a different resolution, (i.e. 800x600), just repeat steps 4 and 5.