VGA Graphic Accelerator

Graphics Accelerator VGA

User's Manual

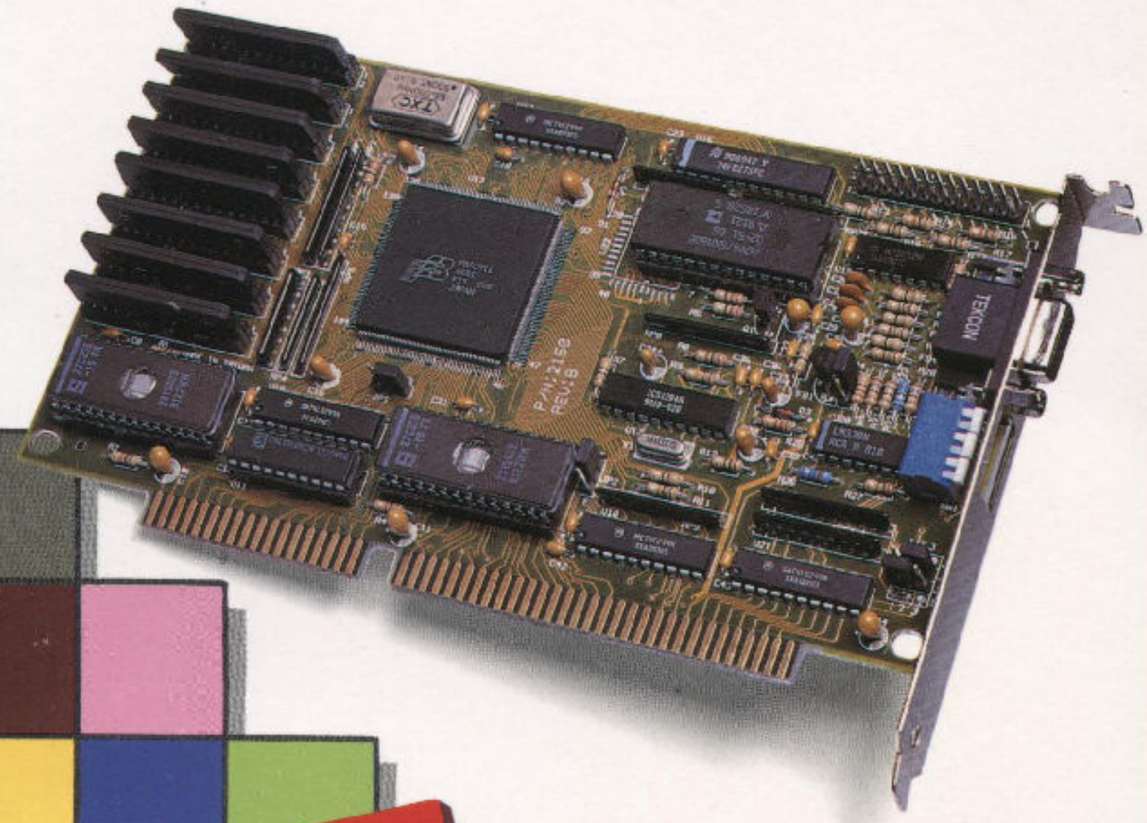

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TABLE OF CONTENTS

PREFACE

CONGRATULATIONS! You have chosen one of the most modern Windows Graphic Accelerator VGA board available in the market today.The Graphic Accelerator VGA is designed for the IBM PC/AT or compatibles. In addition to the IBM VGA Standard, this Graphic Accelerator VGA offers more advanced features: The Graphic User Interface(GUI) accelerator specifically designed to accelerate appliactions running under Windows,presentation manager and X. While maintaining VGA compatibility,the Graphic Accelerator VGA delivers a 40%+ performance improvement over IBM's XGA GUI accelerator. Higher display resolutions 1280x1024 in 16 colors,1024x768 in 256 colors,800x600 in 256 color and VESA Standard Support for flicker free high refresh rate.

Please check that your Graphic Accelerator VGA carton contain the following items:

.Graphic Accelerator VGA Board
.Utility & Driver Diskette
.User's Manual

Please take the time to read the User's Manual. Failure to read the manual's instructions may void our warranty. In the event you experience difficulty in using this product,please review CHAPTER 5 TROUBLESHOOTING before making the final decision to return the Graphic Accelerator VGA board to your dealer. If you do decide to return this board,please return the board and its components in their original packing.

CHAPTER 1

INTRODUCTION

Congratulations on purchasing the Graphic Accelerator Video Graphic Adapter (Short as Graphic Accelerator VGA),you have got a state-of-the-art graphics adapter offering features and functionality exceeding any other in the VGA class.The followings are the enhanced features:

1-1 Features

- Graphic User Interface (GUI) accelerator specifically designed to accelerate applications running under Windows,presentation Manger and X.
- 100% register-level VGA compatibility and fully register-level CGA,HGC and MDA backward compatibility.
- High preformance BitBlt hardware line drawing and rectangle fill capability.
- Extended graphics resolution modes providing 640x480,800 x600,1024x768 and 1280x1024 high resolution when used with multi-frequency analog momitors.
- Support 70Hz or 72Hz Vertical refresh in 640x480, 800x 600 and 1024x768 non-interlaced operating mode.
- Extended text modes providing 132x43,132x25 resolutions allowing your microcomputer using popular emulator and display emulation of widely used terminals.
- Extended graphic mode drivers for AutoCAD, Autoshade, Window 3.0,GEM,Versa CAD and Ventura publisher,and extended text mode drivers in Lotus 1-2-3 and Symphony ,WordPerfect.

1-2 Quick Installation Guide

This section is written for the experienced user who is familiar with personal computer Video Graphic Adapter.He takes only a few minutes to read this section and start to use this Graphics Accelerator VGA.
To quickly install this Graphic Accelerator VGA please do the following steps:

1-2-1 Graphic Accelerator VGA board layout and a brief description

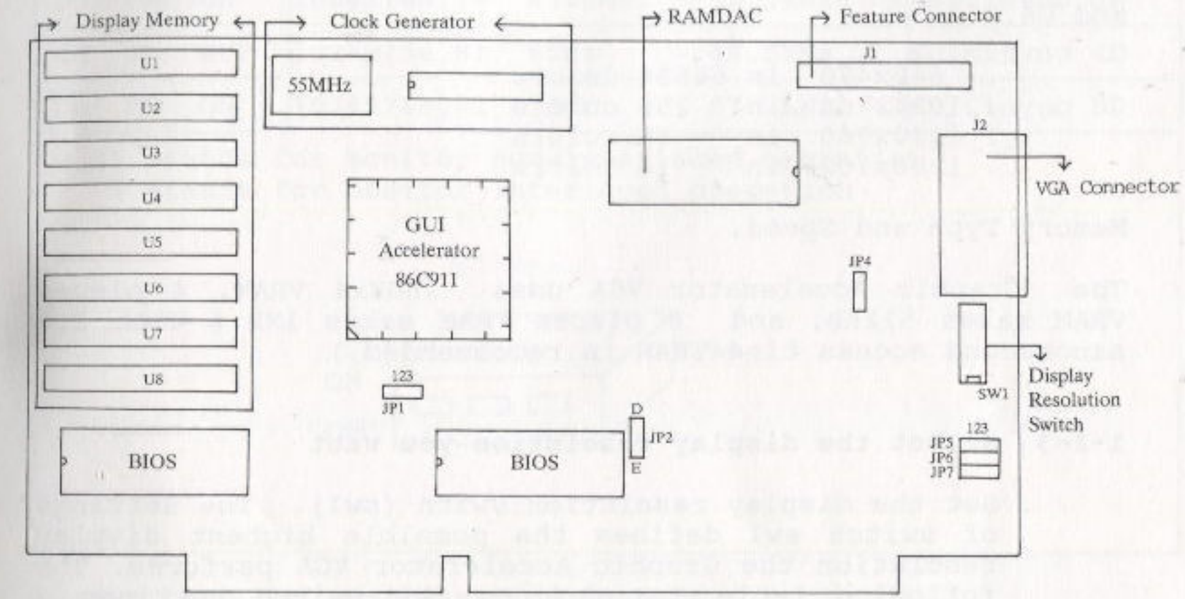


Fig1-1. Graphic Accelerator VGA board layout and a brief description

1-2-2 Check the display memory on the board

Memory Size
Your Graphic Accelerator VGA comes with 512KB VRAM or 1MB VRAM.The memiry size on the adapter determines the graphics resolutions and color depth the Graphic Accelerator VGA provides.

The following resolutions/colors require 512KB VRAM,install 4 256Kx4 VRAM chips in sockets located at U2,U4,U6,U8.

- 640x480 in 256 colors
- 800x600 in 16 colors
- 1024x768 in 16 colors

The following resolutions/colors require 1MB VRAM,install 8 256Kx4 VRAM chips in socket located at U1,U2,U3,U4,U5,U6,U7 and U8.

- 640x480 in 65536 colors
- 1024x768 in 256 colors
- 1280x960 in 16 colors
- 1280x1024 in 16 colors

Memory Type and Speed.

The Graphic Accelerator VGA uses 256Kx4 VRAM. 4 pieces VRAM makes 512KB, and 8 pieces VRAM makes 1MB.(With 100 nanosecond access time VRAM is recommended.)

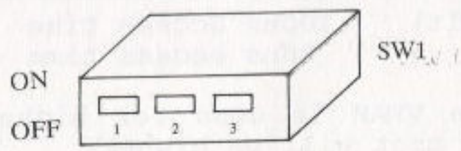
1-2-3 Select the display resolution you want

- Set the display resolution swith (sw1). The settings of switch sw1 defines the possible highest display resolution the Graphic Accelerator VGA performs. The following table 1-1 defines the switch settings , according to the monitor you used,set the swith correctly to avoid demaging the monitor.

Table 1-1 SW1 define the possible highest resolution the Graphic Accelerator VGA performs.

SWICH POSITION 1 2 3	MONITOR TYPE resolution	Vertical frequency	Horizontal frequency	MONITOR Example
OFF OFF OFF	640x480,NI*	60Hz	31.5KHz	VGA
OFF OFF ON	640x480,NI	72Hz	38 KHz	Multisync 3D
OFF ON OFF	800x600,NI	60Hz	38 KHz	Multisync 3D
OFF ON ON	800x600,NI	72Hz	48.5KHz	Multisync 4D
ON OFF OFF	800x600,NI	56Hz	35.5KHz	Multisync 2A
ON OFF ON	1024x768,I*	43.5Hz	35.5KHz	Multisync 2A
ON ON OFF	1024x768,NI	60Hz	48.5KHz	Multisync 4D
ON ON ON	1024x768,NI	70Hz	57 KHz	Multisync 5D

* NI stands for monitor non-interlaced operation
I stands for monitor interlaced operation



1-2-4 Set the configuration jumpers

- Set the display memory size jumper (JP6)

POSITION	DESCRIPTION
1-2	1M Byte display memory
2-3	512K Byte display memory

. Set the analog monitor sense source jumper (JP4)

POSITION	DESCRIPTION
1-2 (default)	Use monitor ID to drive the sense line
2-3	Use color detect logic to drive sense line

During power on the Graphic Accelerator VGA will automatically sense the monitor type connected to this board, normally the monitor will provide the ID signal to VGA connector, if not ,you can select the on board color detect logic to determine the monitor connected.

. Set the IRQ interrupt line (JP2)

POSITION	DESCRIPTION
1-2 (default)	IRQ 2 disable
2-3	IRQ 2 enable

IRQ2 is used for EGA register compatibility, very few application make use of the IRQ2. In some LANs,the network card uses IRQ2,JP2 should be set to disable.

. Set the VRAM speed used jumper (JP5)

POSITION	DISCRIPTION
1-2 (default)	100ns access time
2-3	80ns access time

80ns access time VRAM is used for higher performance, application, but cost will be higher.

. Select the ISA bus speed, Jumper (JP1,JP7)

POSITION		DESCRIPTION
JP1	JP7	
2-3	1-2 (default)	8MHz or 6MHz ISA bus speed
---	---	
1-2	2-3	10MHz or 12MHz ISA bus speed

Normally the AT compatible computer is designed with 8MHz ISA bus speed,but some very few AT compatible computer used 10MHz or 12MHz ISA bus speed for Turbo operation,for this configuration the system memory C0000~DFFFF will be occupied by this board,may be conflict with some LAN and EMS card which use these memory space.

1-2-5 Install the Graphic Accelerator VGA board in your computer

Please refer to chapter 2 INSTALLATION.

1-2-6 Boot the computer system

At the DOS prompt, the Graphics Accelerator VGA will operate in VGA Text mode

1-2-7 Using the Utilities and Drivers

Please read chapter 3 Utiliy and Drivers to select the emulation mode and varies application software drivers.

CHAPTER 2

INSTALLATION

The Graphic Accelerator VGA Installation Instructions

Important: If necessary, consult the user's manual for your computer and any other devices you may have attached to it before you perform the following steps.

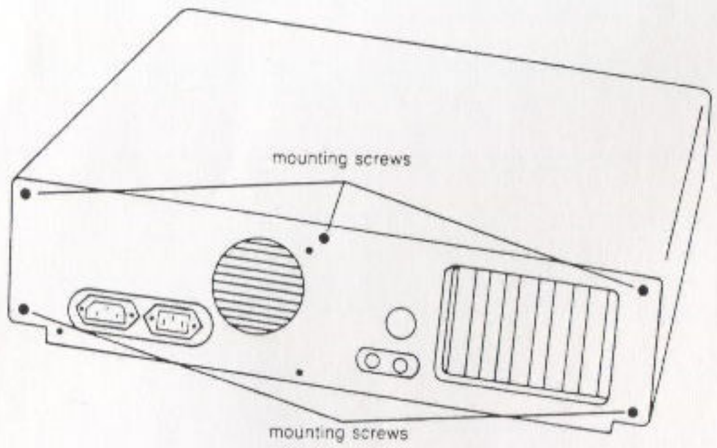
1. Power OFF all devices (printer, display, modem, etc.) you may have attached to your computer.

2. Power OFF your computer system.
   Before you do the next step,Please make sure which cable goes in which connector before disconnecting it.

3. Disconnect all cables from the rear of your computer.

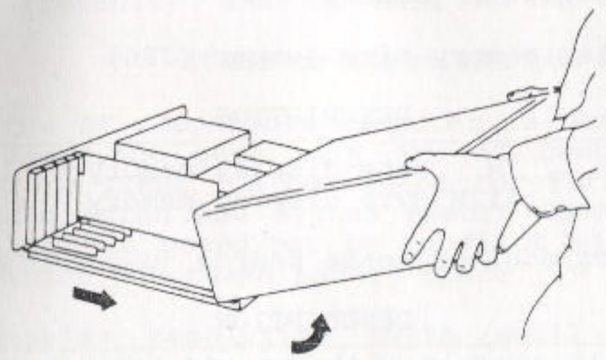
4. Turn your computer to face its back.

5. Use flat-blade screwdriver or 1/4 inch nutdriver to remove the cover mounting screws. Save the screws for reinstalling the cover



6. Now turn the computer so that its front faces you.

7. Carefully slide the computer cover towards you. When the cover will not go any further, tilt it upward and gently lift it away from the computer.



8. Locate the Graphic Accelerator VGA and set the jumpers ,and the switch

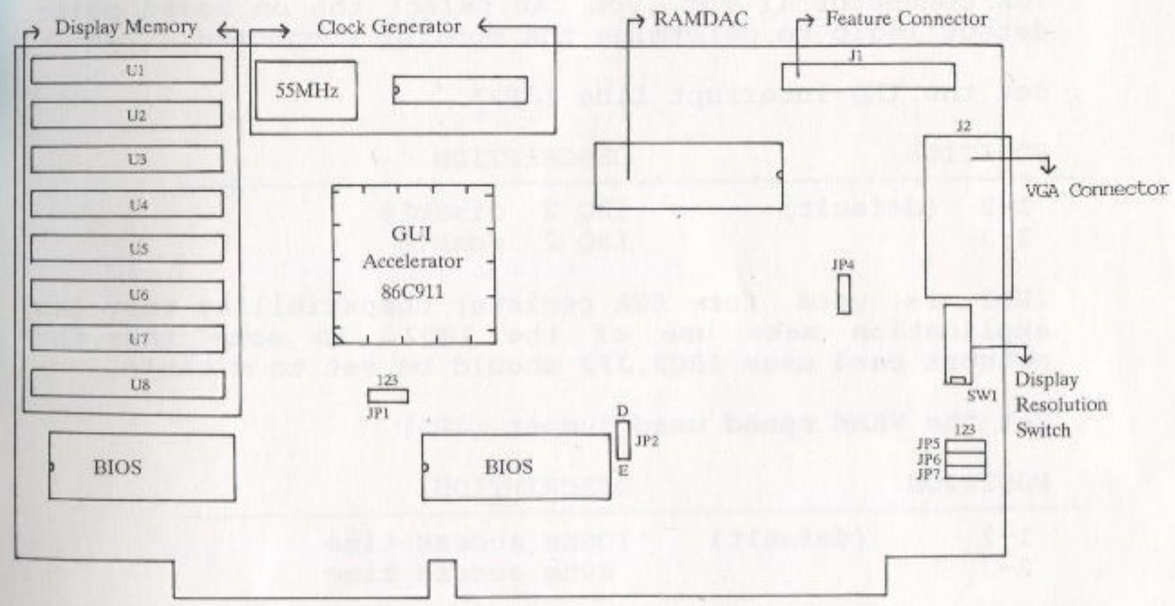


Fig1-1. Graphic Accelerator VGA board layout and a brief description

JP1,JP7--ISA bus speed select
JP2 --IRQ2 interrupt line
JP4 --select the analog monitor sense source.
JP5 --set the VARM access time.
JP6 --set the display memory size.

Set the configuration jumpers

. Set the display memory size jumper (JP6)

POSITION	DESCRIPTION
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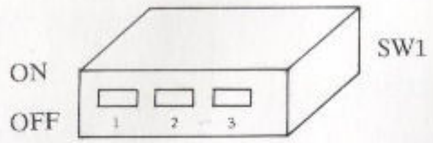
. Set the display resolution swith (sw1). The settings of switch sw1 defines the possible highest display resolution the Graphic Accelerator VGA performs. The following table 2-1 defines the switch settings,according to the monitor you used,set the swith correctly to avoid demaging the monitor.

Table 2-1 SW1 define the possible highest resolution the Graphic Accelerator VGA performs.

SWICH POSITION 1 2 3	MONITOR TYPE resolution	Vertical frequency	Horizontal frequency	MONITOR Example
OFF OFF OFF	640x480,NI*	60Hz	31.5KHz	VGA
OFF OFF ON	640x480,NI	72Hz	38 KHz	Multisync 3D
OFF ON OFF	800x600,NI	60Hz	38 KHz	Multisync 3D
OFF ON ON	800x600,NI	72Hz	48.5KHz	Multisync 4D
ON OFF OFF	800x600,NI	56Hz	35.5KHz	Multisync 2A
ON OFF ON	1024x768,I*	43.5Hz	35.5KHz	Multisync 2A
ON ON OFF	1024x768,NI	60Hz	48.5KHz	Multisync 4D
ON ON ON	1024x768,NI	70Hz	57KHz	Multisync 5D

* NI stands for monitor non-interlaced operation
  I stands for monitor interlaced operation



9. The Graphic Accelerator VGA provides one video 15-pin (DB15) analog connector. The 15-pin (DB15) connector is interfacing this board with analog monitor such as IBM PS/2 monitor (IBM 85xx) or variable frequency monitor (analog mode).

   The following chart shows display monitors that may be attached to the Graphic Accelerator VGA and maximum displayable resolution capabilities.

ENHANCED DISPLAY MODES		COMPATIBLE MONITORS			
RESOLUTION	COLORS	VERTICAL REFERSH RATE		HORIZONTAL RATE	MONITOR EXAMPLE
640x480	16 or 256/256K	60 Hz		31.5 KHz	VGA
		72 Hz		38 KHz	NEC Multisync 3D
800x600	16 or 256/256K	56 Hz		35.5 KHz	NEC Multisync 2A
		60 Hz		38 KHz	NEC Multisync 3D
		72 Hz		48.5 KHz	NEC Multisync 4D
1024x768 (interlaced)	16 or 256/256K	43.5Hz		35.5 KHz	NEC Multisync 2A
1024x768 (non-interlaced)	16 or 256/256K	60 Hz		48.5 KHz	NEC Multisync 4D
1024x768 (non-interlaced)	16 or 256/256K	70 Hz		57 KHz	NEC Multisync 5D

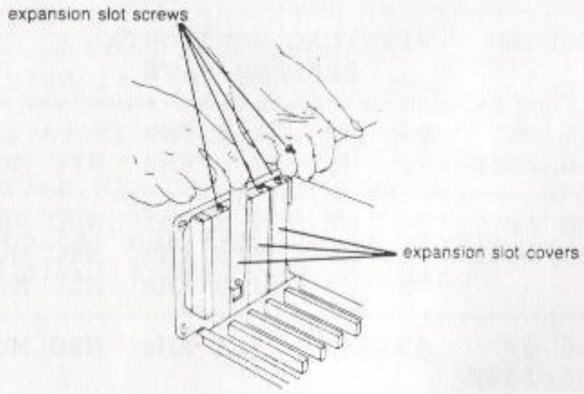
*Compatible analog variable frequency monitors include the Mitsubishi Diamond Scan, NEC MultiSync, Sony Multiscan, Thomson Autoscan, and others.

NOTE: Display monitors which are compatible with the above displays can be used with the Graphic Accelerator.Check with your dealer to ensure the compatibility of any particular display.

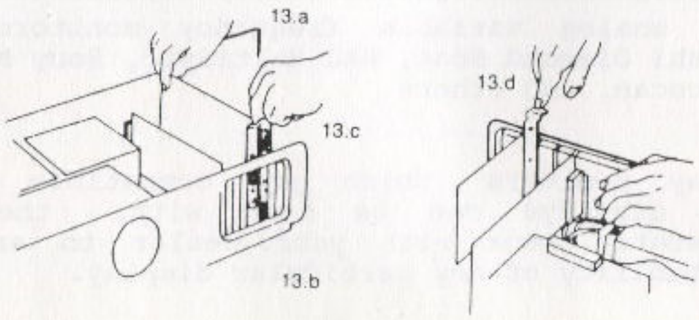
10. The Graphic Accelerator VGA is intended for maxi-mum performance of analog output.Please avoid interfacing monitors with the adapter incorrectly.

11. The Graphic Acelerator VGA may be installed in any unused slot on the mother board. Choose the slot you want for the Graphic Accelerator VGA

12. Remove the screw which holds the chosen expansion slot rear panel cover. Remove the cover and set the screw and cover aside.



13. At this point, you are ready to install your Graphic Accelerator VGA into the system. Refer to the following pictures when you do steps 13.a through 13.d.



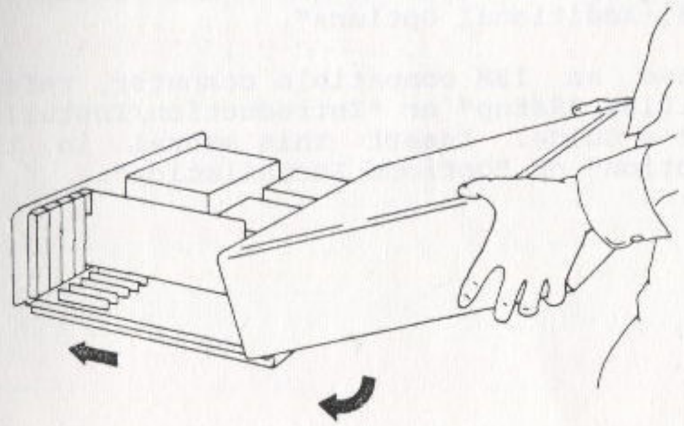
a. Hold the top corners of the Graphic Accelerator VGA and slide it into your computer.

b. Firmly press the Graphic Accelerator VGA into the expansion slot you've chosen, make sure that the board edge connector is seated in the slot.

c. Line up the hole on the top of the retaining bracket on the board with the threaded hole on the lip of the computer rear panel.

d. Insert the screw that was removed from the expansion slot rear panel cover (reverse of Step 12) and tighten it firmly.

14. Hold the computer cover as shown in the figure below, with its front facing you, tilting down in the back. Slip the upper rear edge of the cover over the top of the computer front panel.



15. Lower the cover and carefully slide it back over the computer. Be sure that the lips along the bottom of the cover slide along the rails on each side of the computer chassis.

16. Install the five mounting screws (reverse of Step 5) that hold the cover to the computer.

17. You are now ready to reconnect all cables (reverse of Step 3) to the rear of the computer. If necessary, refer to the instructions supplied with your display monitor, printer or other equipment.

18. After you reconnect all the cables, refer to the documentation provided with the computer to learn how to turn on and use your computer.

NOTE:

- If you have an IBM PC/AT, refer to the Installation and Setup manual of your computer for additional information. Before your IBM PC/AT can be used for the first time, it must be told what options are installed. The Setup Program found on the IBM Diagnostics diskette included with your computer is used for this purpose. Insert this manual into your Installation and Setup manual in "Section 8, Additional Options".

- If you have an IBM compatible computer, refer to the section titled "Setup" or "Introduction/Installation" in your User's Guide. Insert this manual in the section titled "Option" or "Options Installation".

CHAPTER 3

UTILITIES AND DRIVERS

3-1 The Software On Your Graphic Accelerator VGA Utility & Driver Diskette

A program diskette comes with your Graphic Accelerator VGA. It is refered to as the Utility & Driver Diskette, and it includes several routines similar to some utilities found on your DOS diskette. Following are descriptions of these Graphic Accelerator VGA utilities and other files.

SMODE.EXE -- allows you to select the EMULATION modes of the Graphic Accelerator VGA and the different graphics/text modes. Possible to select the VGA/CGA/MDA emulation and/or select a display mode.

VGA_BIOS.EXE -- the latest version of the Graphic Accelerator VGA bios. This is a TSR version of the bios. To install type VGA_BIOS.(optional)

README.DOC -- contains additional information. It may contain instructions for using new Graphic Accelerator VGA utilities or other information which was not available at the time this manual was printed.

3-2 Installing The Graphic Accelerator VGA Utilities

To Install your Graphic Accelerator VGA utility software, simply copy the Utility Diskette onto your PC-/MS-DOS operating system diskette or fixed disk drive. Please remember to back up your Utility & Driver Diskette before using it!

3-3 Using The Graphic Accelerator VGA Utilities

When you installed the Graphic Accelerator VGA utilities, The following are instructions for how to use the Graphic Accelerator VGA utilities.

NOTE

Your DOS Manual contains explanations of common terms, and instructions for how to perform common operations (such as checking your disk directory). Refer to your DOS manual if necessary when you perform the steps outlined in the remainder of this section.

Diskettes containing software drivers for popular commercial programs are included. These drivers permit the use of the Graphic Accelerator's high-resolution modes after properly configured. See following instructions to load these drivers.

3-3.1 Using The Extended Column Modes

The Graphic Accelerator VGA provides you capability to utilize extended column modes with text applications. It means that your Graphic Accelerator VGA board, when interfaced with appropriate color displays, can produce 132x43 and 132x25 modes in addition to the standard 80x25 and 40x25 modes. With the appropriate software, the 132-column display capability allows to emulate terminals which require 132 columns of text.

With the Graphic Accelerator VGA, you can switch back and forth between the 80-column display modes and the various extended-column display modes.

To use SMODE, follow these steps:

1. First, be sure that the SMODE.EXE utility is present on the disk you are using.

2. To switch to the mode you wish to use by typing following command and then press ENTER:

```
SMODE 54 -  switch to 132x43 mode
SMODE 55 -  switch to 132x25 mode
SMODE 3  -  switch to 80x25 mode
SMODE 0  -  switch to 40x25 mode
```

3-3.2 Using The Compatibility Modes

Your Graphic Accelerator VGA is designed to provide compatibility with following modes: IBM's VGA, CGA and MDA mode. SMODE.EXE is the utility program which is used to switch display modes after the PC is turned-on. Because your Graphic Accelerator VGA Adapter supports various types of monitors, various display standards (VGA, CGA, MDA) and various display formats (132-column text,high resolution graphics,etc).user has to properly set the card into the specific mode desired via SMODE. Or one may experience incompatibility difficulties with software being used.

Some programs are written to be run under specific modes or are written according to particular video standards. For example, there are programs that require a monochrome adapter or are written exclusively for a Color Graphics Adapter. When these kinds of programs are used,it becomes necessary to make your Graphic Accelerator VGA board to be the mode what the program requires.This is easily accomplished. In order to select a mode that will change the "appearance" of the video adapter to the software, you only need to select the appropriate SMODE parameter. When another mode is needed or desired, you can simply select the mode using another SMODE parameter. In order to return to the default mode (VGA),type SMODE VGA or power down (the VGA mode will be in effect upon power-up). following is a list of modes and their uses.

SMODE CGA - To set the adapter for compatibility with the Color Graphics Adapter.

SMODE MDA - To set the adapter for compatibility with the Monochrome Display Adapter.

SMODE VGA - To set the adapter for compatibility with the Video Graphics Array.

You may switch modes in this manner as often as you wish.

3-4 Installing The VGA_BIOS.EXE

The VGA_BIOS.EXE is a TSR version of the bios located on the Graphic Accelerator VGA Utility Diskette that is used to transfer the contents of the video ROM BIOS to PC system RAM.

type VGA_BIOS, VGA_BIOS.EXE is installed

Note: If your PC provides shadow RAM,please turn on the shadow RAM instead of using VGA_BIOS.EXE. Shadow RAM provides the same high speed BIOS operation as VGA_BIOS.EXE without consuming your system memory capacity.

3-5 Driver Installation For windows 3.0

Windows 3.0 driver (Preliminary - VER 0.4C)

To install the Graphic Accelerator VGA driver:

Install Windows selecting the VGA driver. Make sure Windows comes up.Exit Windows, and run SETUP - make sure you are in the WINDOWS directory when you run the SETUP program. Select option to change the DISPLAY device and select "Other". You are prompted to insert the WINDOWS driver diskette in the A: drive. Insert the Graphic Accelerator VGA Windows driver diskette into drive A: and follow the instructions to complete the driver installation.

Currently the following modes are supported:
1024 x 768 x 4/8 planes
800 x 600 x 4/8 planes
640 x 480 x 8 planes
640 x 480 x 8 planes with 1/2 M
1280 x 960 x 4 planes (not functional)

Notes:
If you have an older version of the driver installed, run ERASEOLD.BAT from the \WINDOWS directory.

Note the 1280 x 960 x 4 is a preliminary driver, make sure you have a 70Hz Vertical, 57KHz/Horizontal monitor and the switch is set to sw1-1 on,sw1-2 on ,sw1-3 on to run this mode.

If you have only 512KB of memory installed,the driver automatically supports 4 planes in the 1024x768 and the 800 x 600 resolutions.The 640x480 always operates in the 8 plane mode. A special driver is required for 640 x 480 mode with 512KB of memory installed. It is possible to force 4 plane mode of operation with 1M memory installed.With 1M memory option the driver automatically selects 8 plane mode. To override this, run 4PLANE.EXE and then execute Windows."Make sure to run 8PLANE.EXE before running other applications".

Type 4PLANE <CR> to setup for 4 Plane operation.
Type 8PLANE <CR> to return to 8 Plane operation.

NOTE:

If you have already installed a previous version of the driver, copy the file ERASEOLD.BAT into the \windows directory and execute it. Follow this by typing SETUP and reinstall the driver. This Version of the driver works with the BIOS release 0.9 and up.

3-6 Driver Installation For Auto CAD Release 10

Using the ADI 4.0 Display List Driver Installation Auto CAD drivers provide resolutions 1024x768x256 colors, 1024x768x16 colors,800x600x256 colors,800x600x16 colors. Set your default drive and path to the subdirectory where you would like the ADI to reside (usually your AutoCAD 10 directory).

Example:

```
A>c:  (return)
C>cd \ACAD10  (return)
```

Insert the ADI diskette into Drive A and type "a:acaddos".

Example:

```
C:\ACAD10>a:acaddos  (return)
```

Install will copy the appropriate files to your default directory and invoke the configuration utility ADICFG.EXE. Configuration ADICFG lets you select the amount of memory allocated to the display list and to the Autodesk product, as well as choose the interrupt vector used by the ADI and the default background color. To configure or reconfigure the ADI driver type "ADICFG".

Example:

```
C:\ACAD10>adicfg  (return)
```

If you have just run the installation program, this step has already been done for you. The ADICFG main menu shows you the total amount of display list memory you have available, the amount currently unused and the amount currently being used by the display list. If the S3 ADI has not been previously configured, ADICFG will show default values for each type of memory usage, that will add up to the total amount of display list memory available.

To change the value shown for any menu item, press the number shown to the left of the item or scroll to the item desired and press return. A data entry screen will pop up and you can enter the value you desire. When you are finished modifying the installation parameters, press F10 to save the new values and exit,or ESC to exit without saving the new parameters.

Execution

The ADI is a terminate and stay resident (TSR) application that should be run before you invoke the AutoDesk product.Go to the directory where the ADI is installed
(eg. c:\acad10) and type "S3ADI".

Example:

C:\ACAD10>S3ADI (enter)

The ADI will load itself, check for the configuration file and initialize the graphics board. The driver will print the resolution and number of colors the AutoDesk product will be run in and show the display list memory allocation. In addition to the configuration file, the driver can also be configured from the command line. Type "S3ADI ?" for a list of command line options.Once the ADI is loaded, run the AutoDesk product as you normally do, no further interaction with the driver is required.

3-7 Driver Installation For Autodesk's AUTOCAD/386 Release 10

Provided on this diskette is a protected-mode driver for AutoCAD/386, r.10 named "S3PADI40.EXP." This is an ADI 4.0-compliant display-list driver, which runs exclusively in protected-mode. Also included are files containing the character font used by the driver, which should be copied to the default working directory used for AutoCAD drawings. The file ACADPROT.BAT can be used to copy both the driver and font files, by first making the directory containing the executable files for AutoCAD/386 the current working directory, and then typing

A:ACADPROT

The driver can be installed manually by either of the two methods described in the "AutoCAD Installation and Performance Guide" - the simplest method is to rename the driver "ADIDISP.EXP" and copy it to the directory where the Auto-CAD/386 r. 10 executable file resides. Alternatively, the driver can be copied, without renaming, to any desired directory, as long as the environment variable DSPADI is set to the full path name of the driver. In the latter case, for example, the driver could be copied to a directory "C:\ACAD\DRIVERS", with the following command given before running AutoCAD:

SET DSPADI=C:\ACAD\DRIVERS\S3PADI40.EXP

(If this is the preferred method, this command could be inserted into the AUTOEXEC.BAT file, so that it is run automatically whenever the system is re-booted.) Note that, unlike a real-mode driver,a protected-mode driver is NOT run before starting up AutoCAD - AutoCAD/386 will find the driver and load it. It is necessary, however,to configure AutoCAD/386 the first time the driver is used.This is a two-step process.The first step involves use of the utility CFIG386, which is provided on both the AutoCAD/386 distribution diskettes and the Phar Lap DOS-Extender diskettes. The second step is to set the correct display driver options the first time AutoCAD is used with the Graphic Accelerator VGA driver.

CFIG386 is a utility which writes startup parameters into the header of a protected-mode executable file, so that the Phar Lap DOS-Extender configures itself

appropriately as each application is run. AutoCAD/386, as shipped from Autodesk, is no exception, and comes pre-configured for its own default settings. In order to use the Graphic Accelerator VGA driver, it is necessary to add one more parameter to the AutoCAD/386 header. This is done with the following command:

CFIG386 ACAD -CALLB 2

Note that it is necessary to run this command only once, and that this should not affect the operation of other drivers.The only exception to this would be if there is another driver which requires that the same parameter (CALLB or CALLBUFS) be set to a value higher than 2, in which case the higher value should be used. To perform the second step of the configuration process, it is necessary to run AutoCAD/386 and select the correct display driver option.This is done by selecting the "Configure AutoCAD" option from the main menu, then selecting"Configure video display,"and finally selecting "ADI P386 display" from the menu screens that appear. Following completion of the configuration, AutoCAD can be run in the normal way.

When running, the driver will automatically configure itself for the highest resolution mode available for the particular type of monitor that is connected to the display adapter.In addition, the driver has two internal configuration options, which the user can change at any time by selecting "Configure AutoCAD" from the main menu. These options are:

1. To change the screen background from the default black to white.

2. To change the amount of display-list memory to be allocated (the default is 2MB)

To access these options, first select "Allow detailed configuration,"and then " Configure video display."This will result in two additional prompts to the user.In the case of display-list memory allocation,the user is asked to enter the number of 16K pages to allocate. Anything less than 5 pages (80K) will result in display-list management being turned off, since 80K is the minimum required to function properly. It is recommended that as much extended memory as possible be allocated for efficient operation (note that expanded memory - the LIM specification - can NOT be used by the protected-mode driver).

Note that it is not necessary to limit the allocation to the amount of physical memory present in the system - once the limit of physical memory is reached, the Virtual Memory Manager (which is bound into the AutoCAD executable) will begin swapping memory to disk. However, if this occurs, there will be a considerable slowing of the program.Since both AutoCAD's memory usage and the driver's display list are allocated at runtime, it may take a small amount of trial and error to determine the maximum number of display-list pages that can be allocated before the Virtual Memory Manager starts swapping between memory and disk on a given computer. The user can change the number of display-list pages to be allocated at any time by following the above instructions (but be aware that when this is done, data previously in display-list memory will be lost).

3-8 Driver Installation For Autodesk's Auto CAD Release 11 And Autoshade 2.0

INSTALLATION

Since some testers are having troubles in configuring AutoShade 2.0 for use with PADI drivers, we will review it now...

1. Delete "\shade2\shade.cfg"

2. Set environment variables in "\autoexec.bat":
   a. "SHADE=\SHADE2\RMANSUPT"
   b. "DSPADI=\ADI\RCP911.EXP" (or where ever it is)
   c. "RDPADI=%DSPADI%"
   d. "RCPADI=%DSPADI%"

3. Reboot machine.

4. Run "shade" from "\shade2" directory.

5. Select pointing device.

6. Select"P386 Autodesk Device Interface display driver"

7. Choose a mode NOT marked as "Disabled".

8. Select "P386 Autodesk Device Interface rendering driver"

9. Choose a mode NOT marked as "Disabled".

10. Answer "YES" 3 (three) times-
    a. YES, display and AutoShade rendering devices share a single screen.
    b. YES, display and RenderMan rendering devices share a single screen.
    c. YES, FLIP SCREEN does require a redraw.

11. Select a rendering hardcopy device.

12. Eat donut, and drink some coffee. (very important)

13. Quit, and the configuration will be saved.

DISPLAY

ENHANCEMENTS:

1. Memory "holes" plugged in dlist management code. It won't hang during DSTEST anymore.

2. About 5K smaller due to symbol table stripping.

3."Dynamic balancing" feature added to dlist management.

3-9 Driver Installation For Lotus 1-2-3

Installing the Graphic Accelerator VGA Display Drivers for Lotus 1-2-3.In order to install these graphics drivers for Lotus 1-2-3:

1) Install Lotus onto your hard disk as described in the doucmentation included with Lotus. When prompted for the screen type, use 16 color VGA.

2) Goto the subdirectory where Lotus is installed.

   Example: C:\>cd \123

3) Insert the Graphic Accelerator VGA Driver Disk into drive A and close the door.

4) Run the installation file 123INST.BAT on drive A.

   Example: C:\123> a:123inst

5) Run the Lotus 1-2-3 install program.

   Example: C:\123> install

5a) You will be presented with several menu choices. Just for the directions on the screen and do the following in this order:
- Press <Enter> to begin.
- Choose the "Advanced Options" item.
- Choose the "Add New Drivers to the Library" item.
- Press <Enter> to proceed.
- Press <Enter> again to return to the menu.
- Choose the "Modify Current Driver Set" item.

5b) You will now be presented with a list of settings. To change an item, highlight it and you will be given a list of choices for that entry. Eight new drivers have been added to support the Graphic Accelerator VGA,six graphics drivers and two text drivers. There are two graphics drivers (dual and single screen) for each resolution supported by Graphic Accelerator VGA (1024x768,800x600, and 640x480).Select "Graphic Driver" and choose either dual or single screen Carrera for the highest resolution your display will support.Now select "Text Driver" and choose from the Carrera text drivers.When your configuration is correct, press <Esc> to return to the menu.

5c) Now , exit the installation program by doing the following:

- Choose the "Save Changes" item.
- Press <Enter> to accept the current set name
- Press <Enter> again to return to the menu.
- Choose the "Yes" item to leave the install program

6) Run Lotus 1-2-3 as before.

Example: C:\123> lotus

3-10 Driver Installation For Word Perfect V.5.1

In order to install these graphics and text drivers for Word Perfect 5.1:

1) Install Word Perfect onto your hard disk as described in the documentation included with Word Perfect.When prompted for the screen type, choose 16 color VGA.

2) Goto the subdirectory where Word Perfect is installed.

   Example: C:\>cd \wp51

3) Insert the Graphic Accelerator VGA Driver & Utility Disk into drive A and close the door.

4) Run the installation file WPINST.BAT on drive A.

Example: C:\WP51>a:wpinst

5) Run Word Perfect as before.

Example: C:\WP51>wp

6) Word Perfect allows you to select from a list of graphics and/or text drivers from the setup screen.Press <shift><F1> to go to the setup screen,then choose either Text or Graphics Display.You will be presented with several adapters to choose from,including Graphic Accelerator VGA Text and Graphics entries. Choose graphics and you will see choices for 1024x768, 800x600, and 640x480. Choosing text will give you 132x25 and 132x43 resolutions.

3-11 Driver Installation For Microsoft Word V 5.0

In order to install this graphics driver for MS Word 5.0:

1) Install MS Word onto your hard disk as described in the documentation included with Word. When prompted for the scree type, choose 16 color VGA.

2) Goto the subdirectory where word is installed.

Example: C:\>cd \word

3) Insert the Graphic Accelerator VGA Driver & Utility Disk into drive A and close the door.

4) Run the installation file WORDINST.BAT on drive A.

Example: C:\WORD>a:wordinst

5) Run Word as before.

Example: C:\WORD>word

6) Word uses several different display resolutions and character sizes to offer a wide variety of visible characters. Several new modes are now available for use, and the user may choose from a list by pressing the ESC key, the O key, then moving to the DISPLAY

TYPE entry with the arrow keys. Finally, the F1 key brings up the list. The new graphics modes are the entries for 37, 38, 42, 48, 54, 75 and 96 lines. The new text modes are 132x25 and 132x43.

3-12 Driver Installation For GENERIC CADD

Features:

* Very Fast-Written in 100% assembly language

* Very Small-Small driver uses only 3.7K Large driver uses only 14.6K

* Does not require HDILOAD-Leaves more memory available for drawing space Works with all applications Hardware Requirements:

* 286 or better CPU (8088 based machines will not work)
* Graphic Accelerator VGA

Resolution:
* 1024 x 768
* 800 x 600
* 640 x 480
* 16 colors
* 256 colors with 1 megabyte of screen memory

I N S T A L L A T I O N

Automatic installation:
1.Go to disk drive that has a Generic product installed. Don't worry, it will figure out which ones are present.
2. Place the driver install disk in drive A:.
3. Type "CD A:\GENERICA" <cr>.
4. Type "A:INSTALL" <cr>.
5. Run CONFIG program when prompted, selecting this driver.

Manual installation:
1. Go to disk drive and directory that has your Generic product.
2. Place the driver install disk in drive A:.
3. Copy "A:LGEN911.VGD GEN8514.VGD"to the current directory if you plan to use the screen save function.
4. Copy "A:SGEN911.VGD GEN8514.VGD" to the current directory if you don't plan to use the screen save function and need more drawing space.
5.Run CONFIG program, selecting the "IBM 8514/A" driver.

D R I V E R U S E

The driver is loaded and unloaded in memory by CADD, and has no TSR (Terminate and Stay Resident) considerations. If you have no need of the screen save function in CADD, it is recommended that you use the smaller driver. This will give you an additional 11K of drawing space if you have no EMS, or around 88K if you do.

3-13 Driver Installation For MICROSTATION PC

Features:
* Very Fast-Written in 100% assembly language

* Very Small-Uses only 10K, and may be loadhi'd

* Does not require HDILOAD-Leaves more memory available for MGDS Works with all versions, including 4.0

* Convenient-Will remove itself from memory when needed

Hardware Requirements:
* 286 or better CPU (8088 based machines will not work)
* Graphic Accelerator VGA

Resolution:

* 1024 x 768
* 800 x 600
* 640 x 480
* 16 colors
* 256 colors or swap screen (16 colors) with sufficient video memory

I N S T A L L A T I O N

Automatic installation:
1. Go to disk drive that has MicroStation. Don't worry, it will figure out which is present.
2. Place the driver install disk in drive A:.
3. Type "CD A:\MICROSTA"<cr>.
4. Type "A:INSTALL" <cr>.
5. Run the USCONFIG program when prompted, selecting the "ATC Graphics S3 86C911" driver. It will be found under the "Vendor Supplied" selection.

Manual installation:

1. Go to disk drive that has MicroStation.
2. Place the driver install disk in drive A:.
3. Change to the "\USTATION\DRIVERS" directory.
4. Copy "A:MGLS3.EXE" to the current directory.
5. Copy "A:MGLS3.MGL" to the current directory.
6. Change to the "\USTATION" directory.
7. Copy "A:REMOVE.EXE" to the current directory.
8. Run "USCONFIG" , selecting the "ATC Graphics S3 86C911 Accelerator VGA" driver.

D R I V E R U S E

The driver is a TSR (Terminate and Stay Resident) driver that must be invoked before MicroStation PC will run. The driver will accept certain command line options that will change the behaviour of the driver.

If your Graphic Accelerator VGA has at least 1 megabyte of VRAM, this driver will support either 2 pages ("swap screen" capability) or will support 256 colors. To select the 256 color option, use the "/noswap" option When installing the driver in memory. This is usually done by the "USTATION.BAT" or "MCE.BAT" files, and they should be modified with an editor.

To remove a previous copy of the driver,use the 'remove.exe' program.

Examples:
'mgls3' Will install the driver in 16 color mode. If enough VRAM is installed, swap screen will be enabled.

'mgls3 /noswap' Will install the driver, telling it to display the maximum number of colors possible.

T R O U B L E S H O O T I N G

Driver won't install in memory.

Couldn't find a Graphic Accelerator VGA

Accept no substitutes-install a Graphic Accelerator VGA board.

P E R F O R M A N C E T I P S

High loading

To conserve DOS memory, this driver may be loaded into high memory. This can be accomplished by using a 386 memory manager such as QEMM or 386max.

QEMM Example:
"c:\qemm\loadhi c:\ustation\drivers\mgls3"

386MAX Example:
"c:\386max\386load envfree
prog=c:\ustation\drivers\mgls3"

Unloading high loaded drivers

QEMM Example:
"c:\qemm\loadhi /nope c:\ustation\remove"

386MAX Example:
"c:\386max\386load quiet prog=c:\ustation\remove"

MicroStation 4.0 will run faster (redraws 50% faster) if you have a VCPI memory manager (QEMM or 386MAX) present and correctly configured. To optimize your VCPI memory for use with 4.0, all memory outside the DOS 640K range should be configured as EMS memory.

3-14 Driver Installation For VERSACAD

Features:

* Very Fast-Written in 100% assembly language
* Very Small-Uses only 11K
* Versatile-Works with all monitor types.
* High performance features-Full internal display list using EMS
* Does not require HDILOAD- Leaves more memory available for macros Works with all applications including VCAD/386

Hardware Requirements:
* 286 or better CPU (8088 based machines will not work)
* 80287 or 80387
* EMS 4.0 memory (512K minimum)
* Graphic Accelerator VGA

Resolution:
* 1024 x 768 or 800 x 600 on MultiSync displays
* 640 x 480 on all others
* 16 or 256 colors

I N S T A L L A T I O N

Automatic installation:
1. Go to disk drive that has your VersaCAD product(s) installed Don't worry,it will figure out which ones are present.
2. Place the driver install disk in drive A:.
3. Type "CD A:\VERSACAD" <cr>.
4. Type "A:INSTALL" <cr>.
5. Run ENVIRO program when prompted , selecting this driver.

Manual installation (VersaCAD 5.3):
1. Go to disk drive and directory that has VersaCAD (usually \VCAD53)
2. Place the driver install disk in drive A:.
3. Copy "A:VC2_911.COM" to the current directory.
4. Copy "A:VCAD53.CFG" to "ENVIRO.CFG".
5. Run ENVIRO program, selecting the "S3 86C911" driver.

Manual installation (VersaCAD 5.4):
1. Go to disk drive and directory that has VersaCAD (usually \VCAD54)
2. Place the driver install disk in drive A:.
3. Copy "A:VC2_911.COM" to the current directory.
4. Copy "A:VCAD54.CFG" to the current directory.
5. Run ENVIRO program, selecting the "S3 86C911" screen driver. You will be able to choose between "Single Screen" and "Dual Screen" configurations, as well as various resolutions.

Manual installation (VersaCAD 386):
1. Go to disk drive and directory that has VersaCAD (usually \VCAD386)
2. Place the driver install disk in drive A:.
3. Copy "A:VC3_911.COM" to the current directory.
4. Copy "A:VCAD386.CFG" to the current directory.

5. Run ENVIRO program, selecting the "S3 86C911" screen driver . You will be able to choose between "Single Screen"and "Dual Screen" configurations, along with the various resolutions available.

D R I V E R U S E

LOADING THE DRIVER

This driver is a TSR type (Terminate and Stay Resident) program. You only need to install it once in memory each time your machine is powered up. For this reason, it is recommended that a call to this driver be placed in your AUTOEXEC.BAT file. If you are using VersaCAD 5.3 or 5.4 (VersaCAD Design), the driver name will be "VC2_911.COM".If you are using VersaCAD 386, the driver name will be "VC3_911.COM".

HIGH LOADING

For information on loading this driver into the high memory provided by certain 386 memory managers, please see the PEFORMANCE TIPS section of this manual.

EMS MEMORY USAGE

As a default, this driver will reserve 512K of EMS memory when invoked. This will be used to store the display lists needed for fast redraws. While this should be enough memory to handle most drawings,you can tell the driver to reserve more EMS space when the driver is loaded. This is done by setting the environment variable "VCAD_EMS="to the number of EMS pages you wist to have reserved. Each EMS page is 16K in size.

Example:
"SET VCAD_EMS=64" will cause the driver to reserve 1024K (64 pages * 16K) of memory when the driver is loaded.

"SET VCAD_EMS=0" will tell the driver to reserve no pages of EMS for use. This special case tells the driver not to reserve any EMS. In this case, display list processing will be disabled.

SCREEN RESOLUTION

This driver will use the resolution selected by the ENVIRO program. If that mode is unavailable, VersaCAD will not run.

T R O U B L E S H O O T I N G

The driver won't start up, and gives an message about driver failure.

Couldn't find a Graphic Accelerator board ,or not enough memory on board.

Either a Graphic Accelerator board is not installed or broken. Please see your dealer for a compatible card.

Jagged vectors drawn all over screen.

Early 386 chip.

Early versions of the 386 chip had a problem with 32bit math operations. Check the 386 for a sigma (sideways 'M'), and if one does not exist, this is your source of grief. Possible work-arounds include installing a later revision 386 chip ,or turning off the display list option in the ENVIRO program.

EMS not fully compatible.

This driver tests the EMS handler upon loading, checking for correct EMS version (4.0) and looks for the most common bugs in the EMS handler. Some bugs are not detectable at this time and slip through. Two work-arounds exist: update your EMS handler, or turn off the "built in" display list option

P E R F O R M A N C E T I P S

Display List

The main feature of this driver is the built-in display list capability. In order to take advantage of this, VersaCAD must be told that the driver can support display listing, and that you wish to use it. To do this, go into the screen

options in ENVIRO, and select the Built-In option under Display List.

To make the most of the display list, use the display list options menu inside VersaCAD by pressing Ctrl-F5.

To minimize the number of "regens", (where VersaCAD sends down each invidual line) you should zoom the display all the way in, then back out to where you were in the drawing. After doing this, VCAD will redraw everything from the local display list, (sKetches) and zooming and panning (with the arrow keyes) will be much faster. This is done by using the "Full" function from the displist list (LIST) menu, then using the "Out" function from the same menu.

To speed up the panning operations, (scrolling throught the drawing can be done with the arrow keys) you should use a keyboard utility to increase the "Typematic" rate of our keyboard. This will increase the rate at which the scrolling occurs.

High loading

To conserve DOS memory, this driver may be loaded into high memory. This can be accomplished by using a 386 memory manager such as QEMM or 386max. Using high memory for the driver works very well with VersaCAD 286 versions. Since the VCAD 386 program uses a minimum of DOS memory,this will not give any additional performance to VCAD386.

QEMM Example:
"c:\qemm\loadhi c:\vcad54\vc2_911"

386MAX Example:
"c:\386max\386load envfree prog=c:\vcad54\vc2_911.com"
Unloading high loaded drivers

QEMM Example:
"c:\qemm\loadhi /nope c:\vcad54\remove"

386MAX Example:
"c:\386max\386load quiet prog=c:\vcad54\remove"

VersaCAD/386 will run faster (redraws 50% faster) if you have a VCPI memory manager (QEMM or 386MAX) present and correctly configured. To optimize your VCPI memory for use with VCAD/386, all memory outside the DOS 640K range should be configured as EMS memory. This means that all the memory

that would normally be allocated to "DOS high memory" should be reserved for use as EMS.

3-15 Driver Installation For CADKEY / DATACAD

Features:
* Very Fast-Written in 100% assembly language
  Datacad driver uses internal display list
* Very Small-Cadkey driver uses only 5.5K
  Datacad driver uses only 9.6K
* Does not require HDILOA-Leaves more memory available for CADL application Works with all applications including CADKEY / 386 and Cadkey 4.0

Hardware Requirements:
* 286 or better CPU (8088 based machines will not work)
* Graphic Accelerator VGA
* EMS 4.0 (LIM-spec) memory for Datacad display list driver

Resolution:
* 1024 x 768, 16 or 256 colors
* 800 x 600, 16 or 256 colors
* 640 x 480, 256 colors

I N S T A L L A T I O N

Automatic installation:
1. Go to disk drive that has Cadkey or Datacad. Don't worry, it will figure out which is present.
2. Place the driver install disk in drive A:.
3. Type "CD A:\CADKEY" <cr>.
4. Type "A:INSTALL" <cr>.
5. Run CONFIG program when prompted, selecting this driver.

Manual installation (Cadkey)
1. Go to disk drive that has Cadkey.
2. Place the driver install disk in drive A:.
3. Change to the "\CADKEY" directory.
4. Copy "A:CK_911.EXE" to the current directory.
5. Rename the file "GRDEV.DAT" to "GRDEV.BAK".
6. Enter the following command:
   "COPY GRDEV.BAK+A:GRDEV.DAT GRDEV.DAT" <cr>
7. Run CONFIG program, making the following selections:
7.a Select "Set graphics options".
7.b Select "Select graphics device" option.

7.c Select "S3 86C911 (86C911)".
7.d Select the appropriate resolution option, depending upon the monitor you have.
7.e Select the rest of the graphics options, depending upon personal preference.
7.f Exit, saving the new configuration.

Manual installation (DataCAD)
1. Go to disk drive that has Datacad.
2. Place the driver install disk in drive A:.
3. Change to the "\MTEC\DRV" directory.
4. Copy "A:CK_911.EXE" to the current directory, if you have no EMS.
5. Copy "A:DL_911.EXE" to the current directory, if you do have EMS.
6. Rename the file "DRIVERS.GD2" to "DRIVERS2.BAK".
7. Rename the file "DRIVERS.GD4" to "DRIVERS4.BAK".
8. Enter the following two commands:
   "COPY GRAPHICS2.BAK+A:\DRIVERS.GD2 GRAPHICS.GD2" <cr>
   "COPY GRAPHICS4.BAK+A:\DRIVERS.GD4 GRAPHICS.GD4" <cr>
9. Change to the "\MTEC" directory.
10. Run CONFIG program, selecting the "S3 86C911 (86C911)" driver.

Driver Un-Install (Cadkey)
1. Change to the "\CADKEY" directory.
2. Enter the following command.
   "COPY GRDEV.BAK GRDEV.DAT" <cr>
3. Delete the file "CK_911.EXE"
4. Run the Config program, selecting a new device driver.

Driver Un-Install (DataCAD)
1. Change to the "\MTEC\DRV" directory.
2. Enter the following commands:
   "COPY DRIVERS2.BAK DRIVERS.GD2" <cr>
   "COPY DRIVERS4.BAK DRIVERS.GD4" <cr>
3. Delete the files "CK_911.EXE" & "DL_(11.EXE".
4. Change to the "\MTEC" directory.
5. Run the CONFIG program, selecting a new video driver.

D R I V E R U S E

The driver is a TSR (Terminate and Stay Resident) driver that must be invoked before Cadkey (or Datacad) will run. The driver will accept certain command line options that will change the behaviour of the driver. These options will allow you to: remove a previous copy of the driver from

memory, or to install the driver at a different interupt.To remove a previous copy of the driver, use the '-r' option. This driver will install itself on interupt 60h by default. To install it at some other interupt, use the '-f##' option. Where '##' is replaced by a number between 60 and 67.

Examples:

'ck_911'	will install the driver at interupt 60h
'ck_911 -f62'	will install the driver at interupt 62h
'ck_911 -r'	will remove the last installation of the driver.

T R O U B L E S H O O T I N G

Driver won't install in memory. Couldn't find a Graphic Accelerator VGA board Install graphics card, and re-run device driver. No interupt vector may be open. The driver scans all the interupt vectors between 60h and 67h before installing itself. It all of these appear to be in use, the driver will not install. Try forcing the driver to each vector, until one is found that won't hang your machine.

Jagged vectors drawn all over screen.

Early 386 chip.

This problem exists only with DataCAD. Early versions of the 386 chip had a problem with 32 bit math operations. Check the 386 for a sigma (sideways 'M'),and if one does not exist, this is your source of grief. Possible work-arounds include installing a later revision 386 chip, or turning off display list processing. (done by the CONFIG program) Display list redraws no faster. (DataCAD only) EMS not present.Either the driver could not find any EMS, or it is not a compatible version. This driver requires EMS 4.0(LIM spec) memory.

P E R F O R M A N C E T I P S

High loading

To conserve DOS memory, this driver may be loaded into high memory.This can be accomplished by using a 386 memory manager such as QEMM or 386max.

```
QEMM Example:
     "c:\qemm\loadhi c:\cadkey\ck_911"

386MAX Example:
     "c:\386max\386load envfree prog=c:\cadkey\ck_911"


Unloading high loaded drivers

QEMM Example:
     "c:\qemm\loadhi /nope c:\cadkey\ck_911 -r"

386MAX Example:
     "c:\386max\386load quiet prog=c:\cadkey\ck_911 -r"


The DataCAD display list driver has been tested and found to
work very well with the EMS memory managers found in both
QEMM (version 5.0) and 386MAX (version 4.03).
```


CHAPTER 4

ADVANCED INFORMATION

4-1 Graphic Accelerator VGA Supports following screen formats for VGA, Extended VGA & Extended Mode

SUPPORTED SCREEN FORMATS for VGA,Extended VGA& Extended Mode

MODE NO.	VIDEO MODE	COLOR	DISP MODE	CHxROW	CELL	SCREEN FORMAT	BUFFER START	CRT H(P)/V(P) SYNC.	INTER -LACE	DOT CLOCK	ADDTINL MID
0	CGA	4/256K	TEXT	40x25	8x8	320x200	B8000	31.5KHz(-)/70Hz(+)		25.175MHz	ALL
0+	EGA	16/256K	TEXT	40x25	8x14	320x350	B8000	31.5KHz(+)/70Hz(-)		25.175MHz	ALL
0/1+	VGA	16/256K	TEXT	40x25	9x16	360x400	B8000	31.5KHz(-)/70Hz(+)		28.332MHz	ALL
1	CGA	4/256K	TEXT	40x25	8x8	320x200	B8000	31.5KHz(-)/70Hz(+)		25.175MHz	ALL
1+	EGA	16/256K	TEXT	40x25	8x14	320x350	B8000	31.5KHz(+)/70Hz(-)		25.175MHz	ALL
2	CGA	4/256K	TEXT	80x25	8x8	640x200	B8000	31.5KHz(-)/70Hz(+)		25.175MHz	ALL
2+	EGA	16/256K	TEXT	80x25	8x14	640x350	B8000	31.5KHz(+)/70Hz(-)		25.175MHz	ALL
2/3+	VGA	16/256K	TEXT	80x25	9x16	720x400	B8000	31.5KHz(-)/70Hz(+)		28.332MHz	ALL
3	CGA	4/256K	TEXT	80x25	8x8	640x200	B8000	31.5KHz(-)/70Hz(+)		25.175MHz	ALL
3+	EGA	16/256K	TEXT	80x25	8x14	640x350	B8000	31.5KHz(+)/70Hz(-)		25.175MHz	ALL
4	CGA	4/256K	Graph			320x200	B8000	31.5KHz(-)/70Hz(+)		25.175MHz	ALL
5	CGA	4/256K	Graph			320x200	B8000	31.5KHz(-)/70Hz(+)		25.175MHz	ALL
6	CGA	2/256K	Graph			640x200	B8000	31.5KHz(-)/70Hz(+)		25.175MHz	ALL
7	HGC/MDA	4	TEXT	80x25	9x14	720x350	B0000	31.5KHz(+)/70Hz(-)		28.332MHz	ALL
7+	VGA	4	TEXT	80x25	9x16	720x400	A0000	31.5KHz(-)/70Hz(+)		28.332MHz	ALL
D	EGA	16/256K	Graph			320x200	A0000	31.5KHz(-)/70Hz(+)		25.175MHz	ALL
E	EGA	16/256K	Graph			640x200	A0000	31.5KHz(-)/70Hz(+)		25.175MHz	ALL
F+	EGA	4	Graph			640x350	A0000	31.5KHz(+)/70Hz(-)		25.175MHz	ALL
10+	EGA	16x256K	Graph			640x350	A0000	31.5KHz(+)/70Hz(-)		25.175MHz	ALL
11	VGA	2/256K	Graph			640x480	A0000	31.5KHz(-)/60Hz(-)		25.175MHz	ALL
12	VGA	16/256K	Graph			640x480	A0000	31.5KHz(-)/60Hz(-)		25.175MHz	ALL
13	VGA	256/256K	Graph			320x200	A0000	31.5KHz(-)/70Hz(+)		25.175MHz	ALL
54	ExtVGA	16/256K	TEXT	132x43	8x9	1056x387	B8000	31.7KHz(-)/68Hz(+)		40.00 MHz	ALL
55	ExtVGA	16/256K	TEXT	132x25	8x16	1056x400	B8000	31.7KHz(-)/68Hz(+)		40.00 MHz	ALL
101	ExtVGA	256/256K	Graph			640x480	A0000	31.5KHz(-)/60Hz(-)		25.175MHz	ALL
6A/102	ExtVGA	16/256K	Graph			800x600	A0000	37.9KHz(+)/60Hz(+)		40.00 MHz	ALL
104	ExtVGA	16/256K	Graph			1024x768	A0000	35.5KHz(+)/43.5Hz(+)	IL	44.9 MHz	ALL
201	Enhanced	256/256K	Graph			640x480	A0000	31.5KHz(-) /60Hz(+)		25.175MHz	000,010,110
201	Enhanced	256/256K	Graph			640x480	A0000	38 KHz(-) /73Hz(+)		32.5 MHz	001,011,111
202	Enhanced	16/256K	Graph			800x600	A0000	37 KHz(+) /59Hz(+)		38 MHz	100,101
202	Enhanced	16/256K	Graph			800x600	A0000	37.9KHz(+) /60Hz(+)		40.00 MHz	010,110
202	Enhanced	16/256K	Graph			800x600	A0000	48 KHz(+) /72Hz(+)		50.35 MHz	011,111
203	Enhanced	256/256K	Graph			800x600	A0000	37 KHz(+) /59Hz(+)		38 MHz	100,101
203	Enhanced	256/256K	Graph			800x600	A0000	37.9KHz(+) /60Hz(+)		40.00 MHz	010,110
203	Enhanced	256/256K	Graph			800x600	A0000	48 KHz(+) /72Hz(+)		50.35 MHz	011,111
204	Enhanced	16/256K	Graph			1024x768	A0000	35.5KHz(+)/43.5Hz(+)	IL	44.9 MHz	101
204	Enhanced	16/256K	Graph			1024x768	A0000	48.5KHz(+) /60Hz(+)		65.0 MHz	110
204	Enhanced	16/256K	Graph			1024x768	A0000	56.75KHz(+)/70Hz(+)		76.0 MHz	111
205	Enhanced	256/256K	Graph			1024x768	A0000	35.4KHz(+) /43Hz(+)	IL	44.9 MHz	101
205	Enhanced	256/256K	Graph			1024x768	A0000	48.5KHz(+) /60Hz(+)		65.0 MHz	110
205	Enhanced	256/256K	Graph			1024x768	A0000	56.75KHz(+)/70Hz(+)		76.0 MHz	111
206	Enhanced	16/256K	Graph			1280x960	A0000	48 KHz(+) /47Hz(+)	IL	76.0 MHz	111
208	Enhanced	16/256K	Graph			1280x1024	A0000	48.2KHz(+) /45Hz(+)	IL	76.0 MHz	111
301	Enhanced	65K/256K	Graph			640x480	A0000	31.5KHz(-) /60Hz(-)		50.35 MHz	ALL

MCLK = 55mhz, PCLK = DCLK, or a half of DCLK when the screen width is 320 or 360 dots.
The BIOS selects the DCLK depending on the value of Additional Moitor ID (in power On Strapping) for the Enhanded Mode (201-208).

BACKWARD MODE SUPPORTED SCREEN (CGA & MDA/HGC)

MODE NO.	VIDEO MODE	COLOR	DISP MODE	CHxROW	CELL	SCREEN FORMAT	BUFFER START	CRT H(P)/V(P) SYNC.	DOT CLOCK
CGA 0	CGA	4/256K	TEXT	40x25	8x8	320x200	B8000	31.5KHz(-)/70Hz(+)	25.175MHz
CGA 1	CGA	4/256K	TEXT	40x25	8x8	320x200	B8000	31.5KHz(-)/70Hz(+)	25.175MHz
CGA 2	CGA	4/256K	TEXT	80x25	8x8	640x200	B8000	31.5KHz(-)/70Hz(+)	25.175MHz
CGA 3	CGA	4/256K	TEXT	80x25	8x8	640x200	B8000	31.5KHz(-)/70Hz(+)	25.175MHz
CGA 4	CGA	4/256K	Graph			320x200	B8000	31.5KHz(-)/70Hz(+)	25.175MHz
CGA 5	CGA	4/256K	Graph			320x200	B8000	31.5KHz(-)/70Hz(+)	25.175MHz
CGA 6	CGA	2/256K	Grahp			640x200	B8000	31.5KHz(-)/70Hz(+)	25.175MHz
HCA	MDA	4	TEXT	80x25	9x14	720x350	B0000	31.5KHz(+)/70Hz(-)	28.332MHz
HGC T	HGC	4	TEXT	80x25	9x14	720x350	B0000	31.5KHz(+)/70Hz(-)	28.332MHz
HGC G	HGC	2	Graph			720x348	B0000	31.5KHz(+)/70Hz(-)	28.332MHz

MCLK =55MHZ. PCLK=DCLK, or a half of DCLK when the screen width is 320 or 360 dots.

In monochrome modes,4 colors is definded at black,white,"Binkling"white,and"Intensified"white.

4-2 Connector Specification

4-2-1 Analog Video Desplay Connector (J2)

CONNECTOR INFORMATION

Analog Video Display Connector (DB15-S)		
J2	SIGNAL NAME - DESCRIPTION	PIN
Analog Video Display	Red	1
	Green	2
	Blue	3
	Monitor ID bit 2	4
	Ground	5
	Ground	6
	Ground	7
	Ground	8
	Not Used	9
	Ground	10
	Monitor ID bit 0	11
	Monitor ID bit 1	12
	Horizontal Sync	13
	Vertical Sync	14
	Not Used	15

4-2-2 VESA Standard Feature Connector (J1)

VESA STANDARD FEATURE CONNECTOR		
J1	SIGNAL DESCRIPTION	PIN
	Primary Blue	1
	Primary Green	2
	Primary Red	3
	Primary Intensity	4
	Secondary Blue	5
	Secondary Green	6
	Secondary Red	7
	Secondary Intensity	8
	Dot Clock	9
	Blank	10
	Horizontal Sync	11
	Vertical Sync	12
	Ground	13
	Ground	14
	Ground	15
	Ground	16
	Extended Video Selection	17
	Extended Sync Selection	18
	No Connection	19
	No Connection	20
	Ground	21
	Ground	22
	Ground	23
	Ground	24
	No Connector	25
	No Connector	26

4-3 The Graphical User Interface BIOS and GRAPHICS LIBRARY

The Graphic Accelerator VGA supports enhanced mode resolutions, VGA emulation, backwared emulation modes CGA, MDA and also enhanced text modes for 132 column with 43 or 25 rows. For detailed information of invoking these modes via the BIOS please contact your dealer ordering the document of Graphic Accelerator VGA Technical Reference Manual.

The Graphic Accelerator VGA graphics library provides a set of Graphics function which are callable from high level languages. The graphics subroutines are meant to be used by application/driver developers for writting new applications/ drivers or for porting existing applications /drivers to Graphic Accelerator VGA.

The library has a rich feature set and enables tapping the full power of the Graphic Accelerator VGA extended mode.The library was developed using MicroSoft assembly language and the functions are callable from C or assembly language. Three library models(small,medium and large) are provided.

The graphic drawing function set includes:
*polylines, solid and textured.
*relative polylines, solid and textured.
*scanlines.solid and patterned.
*rectangles, solid and patterned.
*polygons,solid and patterned.
*image read.thru and across the plane.
*image write,thru and across the plane.
*bitblt, thru and across the plane.
*erase screen.
*read/write pixel.
*short stroke lines.

The graphics environment function set includes:
*set color and mix,foreground and background.
*set read/write plane mask.
*set line texture pattern.
*set fill pattern.
*set clip rectangle.
*set mode(initialization).
*DAC read/write functions.
*set current point,absolute and relative.
*cursor control functions.

A set globle variables are maintained by graphics functons which reflect the current reawing environment. Calls to the above environment functions(with the exception of set fill

pattern, set write plane mask and set clip rectangle) just record the paratmeters in global variables.The set fill pattern, set write plane mask and set clip rectangle functions,besides recording the parameters in the global variables also the appropriate hardware registers. Applications could set up the global variable for the remaining functions directly.The drawing functions will set up the hardware registers based on the global variable when invoked.

For the detail information of using these libraries please contact your dealer ordering the document of Graphic Accelerator VGA Technical Reference Manual.

CHAPTER 5

TROUBLESHOOTING

If you have problem after installation, one of the following is most probably the cause.

a. Ensure that all cables are properly connected, and that all plugs are firmly seated in their sockets.
b. Ensure that the display monitor is properly connected and that its power is turned on. Power OFF the computer system and all other connected devices before checking the following:
c. Ensure that the board is seated in the expansion slot.
d. Ensure that the Graphic Accelerator VGA board switches/ jumper(s) are set properly.
e. Ensure that no other switch settings on mother board have been accidentally changed. Refer to the documentation provided with your computer to determine the correct switch settings.

If checking these does not locate the problem, there may be a malfunction of the computer system,display monitor or the Graphic Accelerator VGA.

Addendum
(P/N:980-2150I00100)

4-3 The Graphical User Interface BIOS and GRAPHICS LIBRARY

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The Graphic Accelerator VGA graphics library provides a set of Graphics function which are callable from high level languages. The graphics subroutines are meant to be used by application/driver developers for writting new applications/ drivers or for porting existing applications /drivers to Graphic Accelerator VGA.

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*scanlines. solid and patterned.
*rectangles, solid and patterned.
*polygons, solid and patterned.
*image read. thru and across the plane.
*image write, thru and across the plane.
*bitblt, thru and across the plane.
*erase screen.
*read/write pixel.
*short stroke lines.

The graphics environment function set includes:
*set color and mix,foreground and background.
*set read/write plane mask.
*set line texture pattern.
*set fill pattern.
*set clip rectangle.
*set mode(initialization).
*DAC read/write functions.
*set current point,absolute and relative.
*cursor control functions.

A set globle variables are maintained by graphics functons which reflect the current reading environment. Calls to the above environment functions (with the exception of set fill pattern, set write plane mask and set clip rectangle) just record the parameters in global variables. The set fill pattern, set write plane mask and set clip rectangle functions, besides recording the parameters in the global variables also the appropriate hardware registers. Applications could set up the global variable for the remaining functions directly. The drawing functions will set up the hardware registers based on the global variable when invoked.

For the detail information of using these libraries please refer to the README.DOC which is located in " C Library Utility " diskette.