Video-57P
Graphics and Motion Video Accelerator

User's Manual

Version 2.1

SHIELDED CABLE WARNING

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and the receiver.

Connect the equipment into an outlet on a circuit different from that

to which the receiver is connected.

Consult an experienced radio/TV technician for help.

The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio/TV Interference Problems".

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

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation,

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August, 1996

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CHAPTER 1 INTRODUCTION

Congratulation on your purchase of Jaton Video-57P™ Graphics and Motion Video Accelerator, one of new Jaton MediaCircle® products.

Jaton Video-57P uses advanced 64-bit TGUI9680™ GUI Accelerator with hardware video acceleration. It integrated with advanced PCI Plug and Play BIOS with full VESA BIOS Extensions and advanced 64/32-bit memory design. Its advanced VESA Display Data Channel (DDC) features allow monitors to transmit information (DDC1,DDC2B) about their capabilities, and receive configuration information from the host graphics board(DDC2 monitor only). The Deep Green PC feature offers four DPMS states control over the EPA Green Monitor and RAMDAC power down. The Video-57P video acceleration features allow up to 30 FPS motion video playback from CD-ROM without expensive video hardware. Bundled with many high performance device drivers and utilities and the popular Video CD player software, the Video-57P offers you the best Graphics performance and Motion Video playback capability in one card to make your desktop a Multi-Media station possible.

FEATURES

- GUI acceleration: line draw, stroke line, BitBlt, area fill, trapezoidal fill, clipping and expand, Raster OPs, deep caches, Hardware Cursor
- Video CODEC acceleration: Color Space Conversion, Hardware Horizontal and Vertical Scaling, Video Overlay
- Up to 30 fps full screen full-motion video playback
- True-color Video Playback at 1024 x 768
- Complies with the PCI Specification 2.0 : Zero Wait State Burst Mode, Device Auto-configuration, and etc.
- VESA Super VGA BIOS Extension support
- Deep Green PC support with DPMS and DAC power down
- VESA DDC2 interfaces
- Graphics display resolutions from 1600 x 1200 with16 color to 640x480 with 16.7 million colors using one megabyte of DRAM and up to 1280x1024 with 256 colors and up to 800x600 with 16.7 Million colors using 2MB DRAM
- Supports vertical refresh rate of up to 85 Hertz Non-interlaced
- Software utilities and drivers are included.

COMPATIBILITY

- 486 or Pentium PCI Local Bus systems
- Register compatible with EGA and VGA
- Non-interlaced or interlaced monitors
- Multi-Scanning and PS/2 monitors
- VESA DCC2 monitors

RESOLUTION AND COLOR SELECTION

- 640x480 16, 256, 32K, 64K, and 16M colors
- 800x600 16, 256, 32K, 64K, and 16M colors*
- 1024x768 16, 256 colors
- 1280xl024 16, 256* colors non-interlaced
- 1600x1200 16, 256* colors interlaced

*This feature requires 2 megabytes of display memory.

EXTENDED TEXT DISPLAY

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

SOFTWARE DRIVERS AND UTILITIES

DRIVERS

- MS Windows/WFW 3.1x
- Windows 95
- Windows NT 3.1/3.5x
- Windows 3.1/95 DCI Drivers
- OS/2 Warp
- MS Word 5.0/5.5
- WordPerfect 5/5.1/6.0
- WordStar
- AutoCAD Releases 11, 12, and 13
- 3D Studio
- Quattro Pro
- GEM Desktop
- Ventura
- Symphony 1.x
- Lotus 123 R2.x

UTILITIES

- SVM.EXE
- SMONITOR.EXE
- TELLSET.EXE
- TMONITOR.EXE

MOTION VIDEO PLAYBACK

MINIMUM HARDWARE REQUIREMENTS

The following components are minimum requirements for a consumer system to play 15fps 320x240 video in software. To achieve full screen and smooth video playback, a fast Pentium CPU with 16MB RAM and Quad Speed CD-ROM Drive is recommended.

- CPU: 486DX2 66 MHz
- RAM: 8 MB
- BUS: PCI
- CD-ROM: 300KB/Sec.; 400ms; Mode 2; Red Book audio playback
- Audio: 16-bit, 44.1KHz
- Video Acceleration: color conversion, scaling, overlay

MINIMUM SOFTWARE REQUIREMENTS

- Operating System: Windows 3.1x, or Windows 95
- Software Drivers: DCI or DirectDraw Drivers
- Software decoder: MS Video for Windows V1.1d for .AVI
  MPEG Player for Video CD(MPEG-1, CD-I)

CHECK LIST

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

- Graphics and Motion Video Accelerator Board
- Software and Documentation CD-ROM

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

Take this time to record the following information:

Dealer:_____

Date of Purchase: _____

Invoice Number:_____

Dealer's Phone: _____

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

TECHNICAL SUPPORT

TEL:	(408)942-9888
FAX:	(408)942-7788
BBS:	(408)263-8529 (9600 baud, 8N1)
Mail :	MediaCircle Division Jaton Corporation 556 S. Milpitas Blvd. Milpitas, CA95035

In the event you have a technical problem regarding this product, please read Troubleshooting section of this manual and the README files in the driver disks. Updated drivers are available through BBS. Have following information handy when you contact technical support:

- Name of the product.
- Software Driver and Version.
- System Information, such as, CPU speed, BIOS version, Monitor Specification, etc.
- Description of the problems including any error messages.

SOFTWARE UPGRADE

Updated software drivers and utilities are available free of charge through Jaton BBS: (408)-263-8529 (9600baud 8-N-1).

CHAPTER 2 THE VIDEO-57P HARDWARE

OVERVIEW

This section contains information concerning the installation of the Graphics and Video Accelerator board. Please take a few seconds to read through it before installation.

TOOLS NEEDED FOR INSTALLATION

A proper screwdriver is needed for installation of VIDEO-57P.

JUMPER SETTINGS

The VIDEO-57P is 100% compatible with the Intel PCI Automatic Configuration registers.
However, there are two jumpers on the board for setting up display memory speed. They should be left factory default.

J1	J2	Memory Speed
Close	Close	80ns
Open	Close	70ns
Close	Open	60ns
Open	Open	n/a

MEMORY / RESOLUTION

Graphics capabilities are increased incrementally with enhanced memory configurations. The following table shows the maximum colors can be displayed simultaneously under maximum resolutions available with one or two Mega Bytes of display memory.
Please refer to Appendix C for more display mode information and Appendix A for memory upgrade information.

Maximum Color / Resolution / Memory Table

Resolution/Color * *1MB* RAM	Resolution/Color * *2MB* RAM
640x480 24bit True-Color	640x480 32bit True-Color
800x600 16bit Hi-Color	800x600 24bit True-Color
1024x768 256 Color	1024x768 16bit Hi-Color
1280x1024 16 Color	1280x1024 256 Color
1600x1200 16 Color	1600x1200 16 Color

INSTALLATION PROCEDURES

The following steps are intended for upgrading your VGA card. You may need to consult the user manuals for your computer and any other devices attached to it. For the first time assembly of new PC you may find not all of following steps are necessary.

1. Power OFF your computer system and any devices (printer, display, modem, etc.) you may have attached to your computer.
2. If you have many cables attached to your PC, make sure the cables and connectors are labeled before disconnecting them.
3. Disconnect all cables from the rear of your computer.
4. Remove the cover from the computer. And remove or disable your existing VGA card.
5. Install your VIDEO-57P board into any unused PCI slot. Gently but firmly push the board into the slot you choose.
6. Attach the board to the frame. Make sure there are no loosing screws in your PC and replace the computer system cover.
7. Reconnect all cables to the computer. If necessary, refer to the instructions supplied with your display monitor, printer or other equipment.

You have now completed the installation of your new VIDEO-57P board on your system.

The VIDEO-57P board is provided with a 15 pin analog connector. It intended to connect with an analog monitor or compatible device.
For detailed pin-out information, please refer to Appendix B Pin-out

IMPORTANT
The VIDEO-57P board uses the same 15-pin (DB15) cable available from monitor manufacturers to interface with the IBM PS/2 computers. Using an incorrect cable may result in damage to the monitor and/or adapter.

CHAPTER 3 VIDEO

VIDEO ACCELERATION FUNCTIONS

Normally to display video in a window without hardware video acceleration, the video information must go through the CPU for decompression, then the CPU must scale the image, do the necessary color conversions, and manage putting the information on to the screen by sending the video overlay information to the graphics display. On-screen information, i.e. areas covered by the video overlay, must be stored in a separate memory area either in off-screen video memory or in main system memory, which causes delays when restoring the original image to the screen. The illustration below graphically depicts the amount of work that must be done by the CPU.

CPU Tasks					**TGUI 9660**
Video Data Transfer	Decompression	Scaling	Color Space Conversion	Overlay	Graphics Display

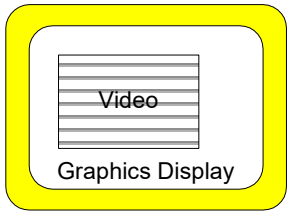
In contrast, the TGUI9680 video overlay functions, when called by the proper driver such as Jaton's DCI driver in Windows 3.1, allow the video image to be mixed with on-screen graphics data without trading the graphics data out of its original area in display memory. These functions also perform color conversion and scaling without the intervention of the CPU, as depicted below.

CPU Tasks		**TGUI9680**			
Video Data Transfer	Decom-pression	Scaling	Color Space Conversion	Overlay	Graphics Display

The end result is that not only is video playback more watchable, but also the CPU is free for other tasks.

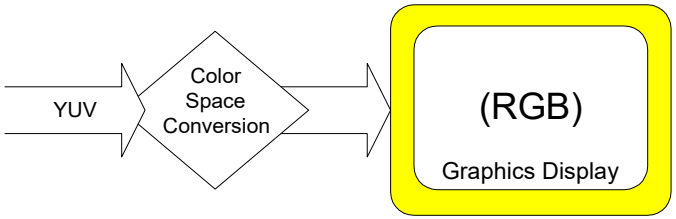
VIDEO OVERLAY

The TGUI9680 overlay function allows a video image to be placed on screen simultaneously with graphics data without removing the graphics data from memory. This results in seamless transitions from graphics to video so that when the video functions obscure graphics data, the graphics data is still in its original location, meaning that restoring the graphics data is instantaneous



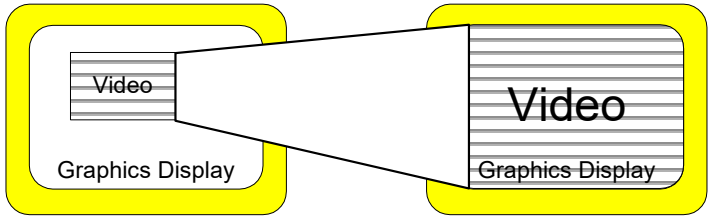
COLOR SPACE CONVERSION

Color Space Conversion means that the YUV input to the TGUI9680 is automatically converted to true color for display in the video window without the intervention of the CPU.



VERTICAL AND HORIZONTAL SCALING

Scaling is essentially the process of taking video data and fitting it to the desired on-screen area. This allows relatively compact data which is easily transported and stored to be displayed full-screen with high picture quality. By doing scaling independently of the CPU, the larger picture comes free of any penalties on applications performance. The TGUI9680 offers any size of vertical and horizontal scaling from miniature live display icons to full-screen display. The TGUI9680 scaling algorithm minimizes the loss of image quality in full-screen zoom out.



CD FORMATS

There are many “standards” of compact discs. The following table list some of those CD formats related to digital video.

CD-ROM	“original” CD-ROM format, as defined by ISO 9660 and the Yellow Book
CD-i	Compact Disc Interactive or Green Book. Proprietary format from Philip for use in their CD-i players
Video CD	MPEG-1 for digital video also known as White Book

SOFTWARE CODEC

Video information contained in a CD often compressed using MPEG, Motion JPEG, or other CODEC (Compression Decompression).
You may use special CODEC hardware or use CPU and Software CODEC such as MPEG, Motion JPEG, Indeo, CinePak, MS Video, QuickTime to playback the compressed digital video.

VIDEO PLAYBACK SOFTWARE

Most CD-ROM title comes with a run time version of the digital video playback software such as MS Video for Windows, QuickTime for Windows and etc. To playback Video CD and CD-i, a MPEG software decoder is needed.

MS VIDEO FOR WINDOWS

Microsoft Video playback on the VIDEO-57P can be achieved with MS Video for Windows 1.1e Runtime or later. The display quality and playback performance can be enhanced by installing the Display Control Interface (DCI) driver since this driver utilizes the Accelerated Video Engine of the TGUI9680 chip. This runtime version is not needed for Windows 95.

Windows DCI driver must be installed and activated before installing Microsoft’s Video for Windows 1.1e Runtime to Windows 3.1x. Refer to the section for Windows 3.1x display driver installation for details.

The following procedure assumes the use of a mouse, Hard Disk Drive C: and CD-ROM Drive X:.

VIDEO FOR WINDOWS INSTALLATION

1. CONFIRM that MS Windows 3.1x is up and running properly using the Jaton Video-57P DCI display driver.
2. In Windows, SELECT the MAIN group in Program Manager.
3. CLICK on FILE or PRESS ALT + F .
4. CLICK on RUN or PRESS R to select command line.
5. INSERT your VIDEO-57P CD-ROM into drive X:. TYPE "X:\VFW1_1E\SETUP" and then PRESS ENTER.
6. CLICK on INSTALL on the installation menu to start the installation of "Video for Windows".
7. A screen for "Video for Windows 1.1e Runtime" will now appear (see Figure 9).

Figure 9

8. CLICK on the "Continue" button (see Figure 10) in the Microsoft Video for Windows Setup dialog box to start installation Video for Windows software.

Figure 10

9. Once all of the files have been installed, CLICK on the "Restart Now" button for the changes to take effect (see Figure 11).

Figure 11

10. When Windows is restarted, GO into the "Accessories" program group to run "Media Player". Jaton's DCI driver is now activated and the line "Video for Windows" will now appear under the "Device" option. SELECT "Video for Windows" to run any files with AVI extension.

INSTALLATION VERIFICATION

If the desired performance is not achieved after the Video Application diskette is installed, the following procedure verifies if Jaton's DCI driver is installed correctly.

1. OPEN your SYSTEM.INI file under C:\WINDOWS with any text editor.
2. LOOK under the section [drivers].
3. LOOK behind the line of "DCI=".
4. If Jatont's DCI driver is installed properly, the word "TDCI" should appear behind "DCI=".

MPEG PLAYER

The VIDEO-57P is bundled with MPEG Player Software. The MPEG Player can play Karaoke CD, Video CD (MPEG-1, CD-i), and other MPEG files.

The MPEG software decoders are designed to work on fast 486 or Pentium CPU and require video acceleration chips like the TGUI9680 to function properly. The new Windows DCI (Display Control Interface) driver is required to run MPEG Player properly under Windows 3.1x. For Windows 95, DirectDraw driver is needed. When all three technologies work together and depending on the speed of the CPU, up to 30 frames per second full-motion video can be experienced. MPEG software decoders in conjunction with the Video-57P are much more cost-effective than currently available MPEG hardware boards.

GETTING STARTED

Before installing the MPEG Player, make sure the following hardware and software is installed and working:

- VIDEO-57P Graphics and Video Accelerator Board
- VIDEO-57P Software and Documentation CD-ROM
- IBM PC 486/Pentium or compatible computer with 8MB RAM

- Microsoft Windows v3.1x with DCI driver loaded or Windows 95 with DirectDraw driver installed;
- a hard disk drive with at least 3MB of free space;
- a double speed or faster CD-ROM drive;
- a 16-bit sound card is optional.

INSTALLING THE MPEG PLAYER FOR WINDOWS 3.1X

1. TURN ON your computer and start Windows.
2. INSERT the VIDEO-57P CD into your CD-ROM drive.
3. OPEN the Windows 3.1x Program Manager and choose the "Run" command from the "File" menu.
4. TYPE "X:\MPEG_31\SETUP" (substitute the drive letter of your CD-ROM drive letter for "X", if necessary), and click the "OK" button; the MPEG Player setup program will start.
5. Follow the setup program's on-screen instructions.

TALLING THE MPEG PLAYER FOR WINDOWS 95

1. TURN ON your computer and start Windows.
2. INSERT the VIDEO-57P CD-ROM into your CD-ROM drive.
3. CLICK ON the Windows 95 "Start" and "Run" button.
4. TYPE "X:\MPEG_95\SETUP" (substitute the drive letter of your CD-ROM drive letter for "X", if necessary), and click the "OK" button; the MPEG Player setup program will start.
5. Follow the setup program's on-screen instructions.

VIDEO PLAYBACK TROUBLESHOOTING

UNREADABLE MPEG FILES

The MPEG Player can play any MPEG file that conforms to the MPEG-1 standard. Some MPEG files do not conform to this standard; e.g., they may have undergone data encryption that renders them readable only by the application that performed the encryption; or they may contain non-standard data. If you attempt to play such an MPEG file with the MPEG Player, an error message appears indicating that the file is unreadable.

Since most CD-ROM titles contain MS Video have the MS Video for Windows run time version, it may cause problem if the version of the MS

Video for Windows from your CD-ROM title is older than 1.1d. If you have the older version VFW installed on Windows 3.1x, reinstall the current version from this CD.

CHAPTER 4 THE VIDEO-57P SOFTWARE

This document provides instructions on the installation of the software drivers supplied with the graphics accelerator board. These software drivers offer performance and quality improvements over the standard graphics software drivers supplied with the computer system, and extend the graphics capability for selected applications by offering options such as increased screen size, color depth and monitor refresh rates, as well as improving overall graphic performance.

SOFTWARE UTILITIES INSTALLATION

INSTALLATION PROCEDURES

The Utility Installation program is used to install and retrieve instructions on:

a) Utility programs
b) Non-Windows applications display drivers.

The Utility installation program is run by executing the following steps:

- 1. INSERT the VIDEO-57P CD-ROM into the CD-ROM drive “X:”.
- 2. Change Directory to X:\DOS_APPS
- 3. TYPE in “README” at the CD-ROM drive prompt.
- 4. A numbered list of destination drives will be displayed on the screen. SELECT the destination drive by TYPING in the corresponding number; e.g., to select drive C, type in “1” (see Figure 12).

Figure 12

5. Files and subdirectories will be expanded into the newly created directory VGAUTIL. A new menu will then be displayed on the screen, showing a list of on-line instructions (see Figure 13).

Figure 13

- 6. Selecting A will display the contents of all drivers in the list.
- 7. Selecting B will display instructions on the available utility programs.
- 8. Selecting C will display instructions on how to install display drivers for non-Windows applications.

UTILITIES SUMMARY

SVM.EXE

SVM is a menu-driven program designed to select and test all video modes available to the adapter.

How To Use SVM

The SVM program can be executed 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.

How To Use SVM From The Menu

- 1. SWITCH directory to "C:\VGAUTIL" where C: is the drive where the Utility software files have been copied.
- 2. TYPE SVM to call up the menu (see Figure 14).

Figure 14

The top bar shows the available color depths. This is traversed through by use of the right/left arrow keys.

The program provides all the different resolutions supported by the board under each color depth.

The graphics adapter can be tested for each resolution/ mode by first high-lighting the selection (e.g. 1024x768-256 colors as shown in Figure 14) by use of the arrow keys, then pressing the F5 key.

The graphics adapter can be run at a selected mode by first selecting the mode and then pressing ENTER.

How to Use SVM From The Command Line

The SVM program may be used to select a mode directly from the command line following two simple steps:

- 1. SWITCH directory to "C:\VGAUTIL" where C: is the drive where the Utility and DOS utility files have been copied.

❁ 2. TYPE in SVM [mode number] and PRESS ENTER.

For example, to run the graphics adapter in mode 62H, the command with mode number for item 2 above would be:

SVM 62 <ENTER>

SMONITOR

SMONITOR is designed to set the monitor group and the monitor type:

Usage: SMONITOR <GROUP|OPTION>

Set Monitor Group

The graphics extended modes set by the graphics card's BIOS are sorted into six groups categorized by the monitor's refresh rate. The group settings are listed below:

	Group							
Resolution	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
640X400	70	70	70	70	70	70	70	70
640x480	60	72	75	85	85	85	85	85
800x600	XX	60	72	75	85	85	85	85
1024x768	XX	87i	60	70	75	85	90	95
1280x1024	XX	XX	87i	87i	60	60	75	75
1600x1200	XX	XX	XX	XX	96i	96i	96i	96i

OPTIONS:

C SET COLOR MONITOR

M SET MONOCHROME MONITOR

The default group number is 0. If you want to set the monitor group, TYPE "SMONITOR GROUP", where GROUP is one of the group numbers listed above.

Set Monitor Color

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 set the monitor as color, TYPE "SMONITOR C"; or,
TYPE "SMONITOR M" to set monochrome monitor.

TMONITOR

The TMONITOR program allows the adjustment of video display parameters so that images are optimally sized and centered on the screen. Adjustable parameters include:

- Horizontal size and position.
- Vertical size and position.
- Vertical pixel frequency (refresh rate).

The program is started from the DOS prompt by typing in TMONITOR from the C:\VGAUTIL directory.
The first section of the program is used to define a given name for the adjustments to be made (see Figure 15).

Figure 15

1. PRESS ENTER to add a new monitor entry; then TYPE in the name of the manufacturer, and then again PRESS ENTER. The program will allow any name to be typed in.
2. TYPE in the associated comments for the monitor settings and PRESS ENTER.
3. A mode table will be displayed, presenting all the adjustable modes as shown in Figure 16.
4. This table is traversed through the use of the up/down arrow keys. The mode highlighted is the selected mode for adjustment.
5. SELECT the mode to be adjusted and PRESS ENTER. Figure 16 shows mode "62 non-interlaced" selected.

Figure 16

❁ 6. SELECT the desired pixel refresh rate and PRESS ENTER *twice*.

Figure 17

❁ 7. The screen alignment test pattern will than be displayed.
The up/down arrow keys are used to adjust the vertical positioning of the screen.
The Left/Right arrow keys are used for horizontal alignment of the screen.
The Home/End keys are used for horizontal screen sizing and the Page Up/Down keys are used for vertical screen sizing.
Once the screen position and size is adjusted,
PRESS ENTER, and then PRESS the ESC key.

❁ 8. To save the settings, TYPE “Y” and PRESS ENTER.
The program will then modify the CONFIG.SYS file.

❁ 9. At this point, PRESS ESC and REBOOT the system to enable the parameter changes.

NOTE: If you exceed the screen adjustment positions, PRESS the ESC key to restart from Step 6.

DOS APPLICATIONS

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

LOTUS 1-2-3™, VERSIONS 2.1 AND 2.2

- 1. COPY the Lotus 1-2-3 driver into your Lotus directory by running SET123 from the \DOS_APPS directory. For example, if the CD is in the X: drive and Lotus 1-2-3 is installed in the C: drive with directory name \LOTUS, TYPE "X:\DOS_APPS\SET123 C:\LOTUS".
- 2. CHANGE to the 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.

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. The following row values may be used: 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, then EXIT the Lotus 1-2-3 installation program.
9. Installation is complete for Lotus 1-2-3. To reconfigure for a different resolution (i.e. 132x25 to 132x30 in text mode), follow steps 3 through 8, then run Lotus 1-2-3 as usual.

SYMPHONY™ 2.X

1. COPY the Symphony driver to the \SYMPHONY directory by running the SETSYMPH utility found in the X:\DOS_APPS 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. 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. The following row values may be used: 25, 30, 43, or 60.

For graphics mode, SELECT the following command line:
TVGA 64Ox480 for Release 2.X

9. RETURN to the Symphony main menu and CHOOSE "Save Changes" to record the changes, then EXIT the Symphony installation program.

10. Installation is complete for Symphony. To reconfigure for a different resolution (i.e. 132x25 to 132x30 in text mode), follow Steps 4 through 9, then run Symphony as usual.

GEM™ DESKTOP 3.XX

1. Follow the prompts 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 in side GEM. They are listed in a text window. 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 then the listed graphics and card display.
5. When prompted for 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 information on the GEMSETUP program.

VENTURA PUBLISHER™

1. FOLLOW prompts to prepare a Ventura driver diskette. The installation program will copy driver files to the newly formatted diskette in drive A:.
2. ENTER the location of the Ventura directory on the hard disk when prompted (e.g. C:\VP). ENTER the path and then SELECTOK.
3. INDICATE whether or not the Ventura Publisher Professional Extension is being used.
4. SELECT one of the display modes listed.
5. INDICATE the type of mouse being used and, if necessary, to which I/O port (i.e. COM1, COM2, etc.) the mouse is connected.
6. CONFIRM choices to complete the installation.

To reconfigure for a different display mode, repeat this entire installation procedure.

WORDPERFECT 5.1

TO INSTALL THE TEXT MODE DRIVERS

- 1. COPY the driver files from X:\DOS_APPS\WP51 directory on your CD-ROM drive into your WordPerfect 5.1 directory; e.g., C:\WP51). TYPE:
  "Copy X:\DOS_APPS\UF51\TVGATEXT.VRS C:\VP51".
  The display drivers (TVGATEXT.VRS) will be copied automatically to the WordPerfect directory.
- 2. The remaining steps need to be completed inside WordPerfect. They are listed in a text window. Note them or reference steps 3 through 5.
- 3. RUN WordPerfect 5.1 by TYPING "WP" at the WordPerfect 5.1 program directory.
- 4. PRESS Shift-FI to call 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, l32x30, 132x43, 132x60.
- 6. Driver installation is complete for WordPerfect. To reconfigure for a different resolution, e.g. 132x25 to 132x30 in text mode, repeat steps 4 and 5.

TO INSTALL EXTENDED GRAPHICS MODE DRIVERS

- 1. COPY the driver files from X:\DOS_APPS\WP51 directory on the hard disk drive into the WordPerfect 5.1 directory; e.g., C:\WP51. If WordPerfect 5.1 is installed in drive C: and the driver\utility is installed in driver D:, TYPE:

  "Copy X:\DOS_APPS\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 in WordPerfect. They are listed in a text window. Note them 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-FI to call 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 768xl024-16 colors.

6. Driver installation is complete for WordPerfect. To reconfigure for a different resolution, (i.e. 800x600), repeat steps 4 and 5.

WORDPERFECT 6.0

TO INSTALL THE TEXT MODE DRIVERS

1. COPY the driver file from X:\DOS_APPS\WP60 directory on the hard drive into the WordPerfect 6.0 directory (e.g. \WP6.0). For example, if WordPerfect 6.0 application is installed in drive C: and the driver\utility program is installed in drive D:, TYPE: "Copy X:\DOS_APPS\WP60\TVGA6TXT.VRS C: \WP60".
2. To run WordPerfect 6.0 from the directory, TYPE "WP".
3. ENSURE WordPerfect 6.0 Text Mode is selected. There should be a check mark or an asterisk in front of "Text Mode" under the View pull-down menu.
4. SELECT SETUP under the File pull-down menu, and CHOOSE 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 selecting either Text Mode or Graphic Mode Interface. For graphic mode, install the VESA driver and select a resolution from 640x480 to 1024x768.

1. SELECT the VESA driver that is included in the WordPerfect 6.0 program.
2. ENSURE the VESA driver from WP6.0 installation program is selected and installed.
   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.

MS WORD 5.0

- 1. COPY the MS Word driver from the X:\DOS_APPS\Word directory on the hard drive into the MS Word 5.0 directory (e.g. \Word50). For example, if MS Word 5.0 is installed in drive C: and the Driver/Utility is installed in drive D:, TYPE: "Copy X:\DOS_APPS\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. Note them or reference steps 3 through 5.
- 3. RUN MS Word 5.0 by typing "WORD" at the prompt in the 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 the display:

(1) Text, 25 lines, 16 color	(5) Text, 25 lines, 16 color[1]
(2) Text, 43 lines, 16 color	(6) Text, 30 lines, 16 color[1]
(3) Text, 50 lines, 16 color	(7) Text, 43 lines, 16 color[1]
(4) Text, 60 lines, 16 color	(8) Text, 60 lines, 16 color[1]

Note 1: Lines 5 through 8 are for 132 column modes. Mouse support is not available for 132 column modes.

- 6. Driver installation for MS Word is complete. To reconfigure for a different resolution, i.e. 132x25, repeat steps 4 and 5.

MS WORD 5.5

- 1. CHANGE the directory to X:\DOS_APPS\Word55.
- 2. TYPE "SETUP" to run the setup program.
  FOLLOW the instructions on the screen to complete the driver installation.

AUTOCAD™ TURBODLD CLASSIC DRIVER

TurboDLD Classic Driver by Panacea for Trident is a combined display interface and rendering driver. It supports DOS versions of AutoCAD 10/386, 11/386, 12/386 and 13/386. It offers the following resolutions for the drawing editor :

640x480	256 colors
800x600	256 colors

1024x768	256 colors
1280x1024	256 colors (2MB video RAM required)
1600x1200	256 colors (4MB video RAM required)
640x480	65K colors
800x600	65K colors
1024x768	65K colors (2MB video RAM required)
640x480	16M colors
800x600	16M colors (2MB video RAM required)

It also offers the following resolutions for rendering:

640x480	256 colors
800x600	256 colors
1024x768	256 colors
1280x1024	256 colors (2MB video RAM required)
1600x1200	256 colors (4MB video RAM required)
640x480	65K colors
800x600	65K colors
1024x768	65K colors (2MB video RAM required)
640x480	16M colors
800x600	16M colors (2MB video RAM required)

IMPORTANT: **Ensure that AutoCAD is already installed with the IBM Standard VGA driver.**

AUTOCAD/386 RELEASE 10 AND 11

- 1. CHANGE the directory to C:\VGAUTIL\ACAD.
  TYPE "INSTALL", PRESS the ENTER key.
  FOLLOW the installation steps on the screen. The TurboDLD Classic Driver and the other files will be copied to the proper ACAD working subdirectory.
- 2. RUN DLD386's FASTCAD.BAT, or
  COPY the commands from the file into the AUTOEXEC.BAT file *before* running AutoCAD.
  FASTCAD.BAT sets the environment variables including DLDCFG, DSPADI, RDPADI and RCPADI.
- 3. START AutoCAD/386 and SELECT CONFIGURE AUTOCAD from the Main Menu.
- 4. SELECT CONFIGURE VIDEO DISPLAY.

5. SELECT ADI P386 v4.0/4.1 display.
   This will call up TurboDLD's configuration menu, which should be used to select the desired graphics board, resolution.
6. SELECT the graphics area background color, text color (for the menu status line and command prompt areas of the screen), text background color, border color, and dialog box/button outline color.
   To select the default colors, PRESS ENTER at each prompt.
   To select a different color, ENTER the desired color number at the given prompt.

AUTOCAD/386 RELEASE 12 AND 13

Display Driver Installation Procedure

1. CHANGE the directory to C:\VGAUTIL\ACAD.
2. TYPE "INSTALL" and PRESS the ENTER key.
3. FOLLOW the installation steps on the screen. The TurboDLD Classic Driver and the other files will be copied to the proper ACAD working subdirectory.

Editor Installation Procedure

The display driver for the drawing editor and rendering, is installed by following these steps:

1. RUN the AutoCAD Drawing Editor screen.
2. SELECT CONFIGURE in the File pull-down menu.
   AutoCAD will then switch to a text screen.
3. PRESS any key to continue after reading the "Welcome to TurboDLD!" file.
4. SELECT "Select Graphics Board/Resolution" in the TurboDLD Classic V2.10 for the Trident Main Menu.
5. FOLLOW the menu to select the desired resolution.
6. SAVE the selection, and
   EXIT from TurboDLD's configuration.
7. ENTER "0" to return to the Drawing Editor screen**.**
8. ANSWER "Y" to save configuration changes.

Rendering Installation Procedure

1. ENSURE that Rendering for AutoCAD Rev 12 is already installed.
2. SELECT PREFERENCES in the Render pull-down menu from the Drawing Editor screen.

3. If Rendering has been previously configured, SELECT RECONFIGURE in the Rendering Preferences dialog box. Otherwise, the program automatically will switch directly to a text screen.
4. SELECT "2" to configure the rendering driver.
5. SELECT "AUTOCAD'S CONFIGURED P386 ADI COMBINED DISPLAY/RENDERING DRIVER."
6. SELECT the desired resolution for rendering.
7. SELECT the desired rendering view
8. ENTER "0" to return to the Drawing Editor screen.
9. ANSWER "Y" to save configuration changes. CLICK OK to close the Rendering Preferences dialog box

QUATTRO PRO™ 2.X FOR DOS

1. COPY the Quattro Pro driver from the X:\DOS_APPS\PRO directory on the hard drive into the 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 X:\DOS_APPS\QFRO\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. Note them or reference steps 3 through 5.
3. 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.

The graphic driver installation for Quattro Pro is complete. To reconfigure for a different resolution, i.e. 800x600, repeat steps 4 and 5.

MICROSOFT WINDOWS® 3.1

DISPLAY DRIVER INSTALLATION

The graphic installation program (INSTALL) supports a simple six-step installation procedure for the Windows 3.1 DCI display driver setup program, the power management program and the UNinstall program.

To use INSTALL, follow the 6 steps below:

- 1. ENSURE that MS Windows 3.1 is up and running properly, using the standard VGA driver.
- 2. SELECT the MAIN group in Program Manager.
- 3. CLICK on FILE or press ALT + F (see Figure 1)

Figure 1.

- 4. CLICK on RUN or PRESS R to select command line.
- 5. TYPE in "X:WIN_31\INSTALL" (if the display driver disk is in the floppy drive then TYPE in "A:INSTALL") and then PRESS ENTER (see Figure 2).

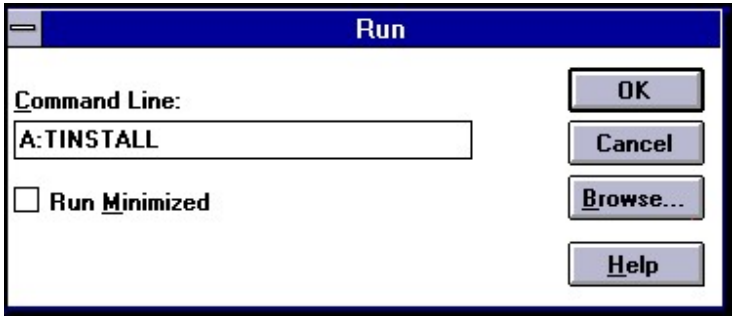


Figure 2.

- 6. A menu will appear, presenting a choice of Express or Custom Installation.

Express installation is quick and decision free. Display drivers will be copied into the JATON.XGI directory and Utility files will be copied into the JATON.UTL directory. Once all files are copied, a program group called DISPLAY DRIVER AND UTILITIES will be created.
Custom installation allows control over file storage and in what program group the icons are placed. The first dialog box that appears shows the default directory to which the display drivers will be copied. To change the directory name select the default name, delete it and then enter the desired directory name. Once the desired directory name is selected, continue the installation procedure by selecting CONTINUE, or by pressing ENTER. The next dialog box displays a summary of where files are stored. Select CONTINUE to copy the drivers and utilities files. When all files are copied, the program will present a choice of program groups where the icons will be created. Create a new group to place the utility icons or select from pre-existing groups (e.g. main, applications, accessories etc.).
When all necessary files are copied and a group name is selected, the INSTALL program will create three icons:

- a. Screen Control (Used to configure display drivers).
- b. DPMS (Used for power management configurations).
- c. UNinstall (Used to delete the installed Video-57P display drivers).

NOTE: Different "display driver set" versions cannot be installed to the same directory name.

"Display driver sets" of the same version number (e.g. UX6.x) will replace the existing one.

SCREEN CONTROL

The Screen Control panel contains controls for setting screen resolution, color depth, font size, refresh rates. Not all combinations of screen resolution, color depth, font size and refresh rate are attainable.
Color depths of 16, 256, 64K, or 16.7M colors can be selected by clicking next to the desired option. Color depth determines the number of colors that may be simultaneously displayed on the screen. The selected color depth determines the possible resolutions.
Screen resolutions of 640x480, 800x600, 1024x768, 1280x1024 or 1600x1200 can be selected by clicking next to the available options. The virtual screen size is automatically adjusted to be at least as large as the selected screen resolution.
Available refresh rates are dependent on the selected color depth and resolution. The "Back to Default" option is used to reset the refresh rate to the factory default value in case your monitor does not support a high refresh rate.

CONFIGURING THE DISPLAY DRIVER

- Select the color depth first. If the current driver does not support the selected color depth, then Windows will have to be restarted.
- Select the resolution.
- Select the font size (if available as an option).
- Select the refresh rate.
- Click on OK. If the current driver does not support the selected configuration, Windows will have to be restarted.

NOTE: Hot Key Control Should be enabled before going into advanced setup. There is no virtual screen support for 16 colors.

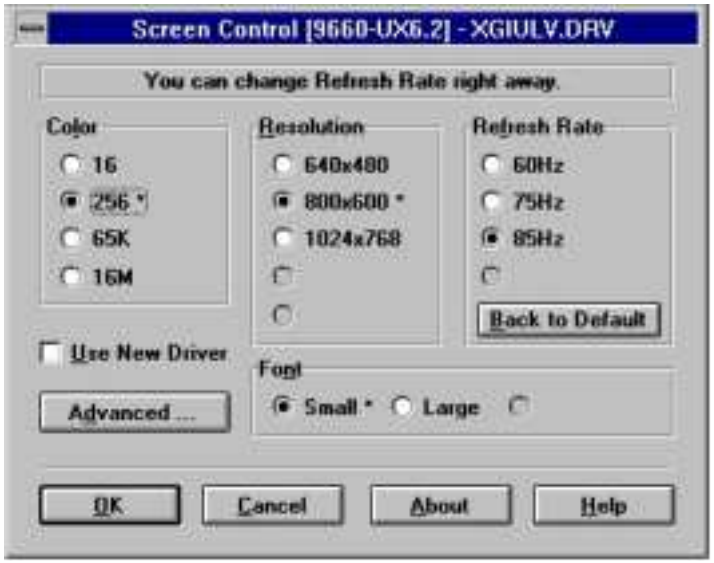


Figure 3

ADVANCED FEATURES (VIRTUAL SCREEN CONTROL)

The advanced features of the program is accessed by pressing ALT + D or by clicking on the box marked Advanced.
This action opens up an extension of the Main Panel that presents the following features:

- 1. **Hot Key** selection. Enabling this function allows setting up predefined key strokes achieve specific virtual screen related actions.
- 2. **Turn On** virtual screen. This function allows the use of the predefined virtual screen sizes. The predefined virtual screen sizes are selected by clicking next to available options. The size of the available predefined virtual screen is dependent on the selected color depth and resolution.
- 3. **Customize** Virtual screen area. Selecting this feature opens up a new screen titled Virtual Screen Advanced Settings. The features presented through this screen are as follows:

Standard display resolutions are 640x480, 800x600, 1024x768 or 1280x1024. The amount of display memory used depends on the selected resolution and color depth. For resolutions of 640x480, 800x600 and 1024x768, there is a substantial amount of display memory left unused. The Virtual Screen

features takes advantage of this unused memory by “expanding” the display area into the off-screen area.
Virtual Screen Control allows the user to make effective use of a display screen larger than the standard 640x480, 800x600 or 1024x768, and the standard resolution is the center of the screen. The user can “pan” around the larger Virtual Screen area by the use of a standard mouse or a set of “HOT KEYS.” For example, it is possible to select a resolution of 640x480 and set the Virtual Screen size to 800x600. Thus, the 640x480 screen sits at the center of a 800x600 matrix, and the user can “pan” through the entire 800x600 matrix in a 640x480 window (see Figure 4).

Figure 4.

The advanced features provide functions to customize the virtual screen, as shown in Figure 5:

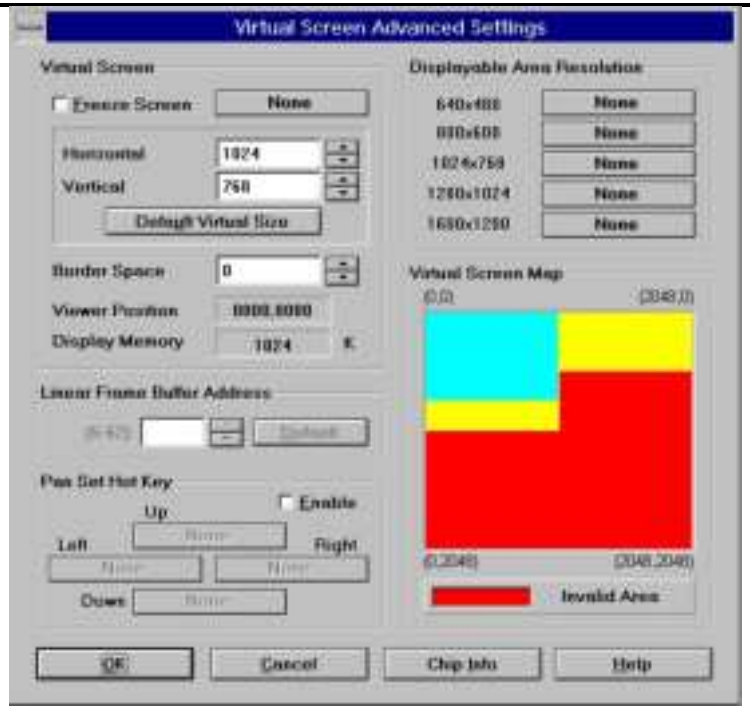


Figure 5. Display Driver Advanced Settings

FREEZE SCREEN

The Freeze Screen option is used to disable the panning feature, giving the illusion of a frozen screen but keeping other virtual screen functions available. Hot key functions are available for this feature.

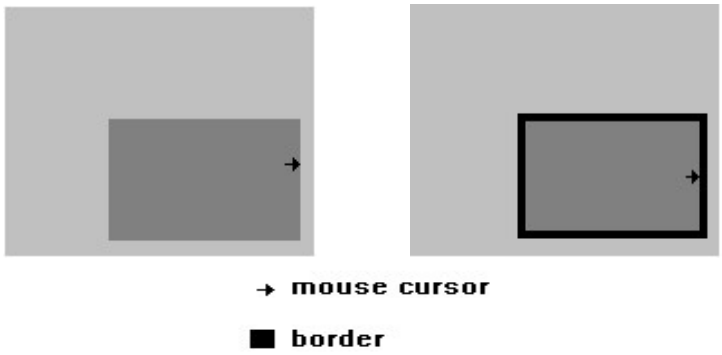
LINEAR FRAME BUFFER ADDRESS

The Linear Addressing driver will automatically detect the system's memory size and sets the frame buffer to an unused area above the system memory (VL bus card only, not applicable here). The Linear Frame Buffer Address setting is useful in avoiding conflicts with Windows applications which use the same linear frame buffer address as the Display Driver. Addresses between 18 and 63 MB can be selected. If there is no conflict, the default setting is highly recommended.

BORDER SPACE

The Border Space option is used to set up a border (thickness measured in pixels) within the Displayable Area, which is used as a marker for panning the

screen, i.e. when the cursor hits against this border, screen panning occurs (see Figure 6).



NOTE: Border space sets up a transparent border (black area) on the display area, that is used as a threshold to start panning the virtual screen.

Figure 6.

PAN SET HOT KEY

Hot keys can be set up to pan the virtual screen left, right, up and down. The feature has to be enabled first by clicking on the ENABLE box, before hot keys can be selected.
Once all selections are made, click on **OK** or press ALT + O to exit the advanced setup.

DPMS (DISPLAY POWER MANAGEMENT SIGNALING)

The POWER MANAGEMENT program is designed for energy-saving monitors that conform to the VESA™ Display Power Management Signaling (DPMS) standard.

> ***WARNING:*** **THE USE OF THIS PROGRAM IS NOT RECOMMENDED FOR MONITORS THAT DO NOT SUPPORT THE VESA DPMS STANDARD.**

The program offers three power-down modes:

- 1. Standby (minimum power savings)
- 2. Suspend (substantial power savings)
- 3. Off state (maximum power savings)

Figure 7.

The program monitors for mouse and/or keyboard activity. When activity is not detected for a specified delay period (controlled by the Delay Time parameter), the program signals the TGUI9680™ to enter the selected power-down modes.
The Display Power Management program offers several options to customize the DPMS operation:

DELAY TIME

The delay time to enter each mode can be set by entering the value (in minutes) in the Delay Time parameters. Values can be entered by either clicking on the count-up or count-down button, or by clicking on the number, deleting it, and typing in the desired time in minutes (see Figure 8).

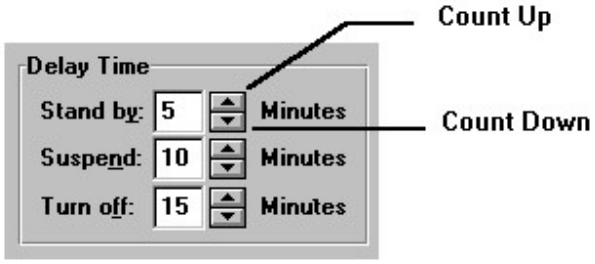


Figure 8. Delay Time

ACTIVITY SELECT

The Activity Select option selects which activity the program senses in order to restore the display to the monitor. For example, if both mouse and keyboard are selected, then either activity will re-establish the powered down signals.

PASSWORD OPTION

The Password Option sets up a password to get back onto the screen.

1. A password is set up by first CLICKING on the box marked PASSWORD PROTECTED or by PRESSING ALT + P (this is confirmed by the presence of an "X" in the box).
2. PRESS ALT + S or click on the box marked SET PASSWORD.
3. TYPE in the selected password (twice) and SELECT OK, or PRESS ENTER.

CLOCK

Turning on the clock enables the digital count down display.

ALARM

If the Alarm option is enabled, then the last 5 seconds of countdown to Stand by mode is synchronized with beeps from the PC speaker.

STARTUP ON/OFF

This option installs the Display Power Management program onto the Windows Startup file, so that DPMS is active upon entering Windows.

DEFAULT

The default button sets all parameters back to the factory default values.

TEST

The test feature is used to give a demonstration of the DPMS power down function.

SAVE

This feature is used to save all the current settings.
Once all settings are selected, the program is activated by pressing ALT + O or by clicking on the box marked Turn On DPMS.

UNINSTALL DISPLAY DRIVER

The UNinstall program enables the user to safely delete specific display drivers or an entire display driver set.
To remove an entire Display Driver Set, complete the following steps:

- 1. Using the arrow keys or mouse, SELECT the Display Driver Set that is to be removed (the set to be deleted should be high-lighted).
- 2. Once the desired Driver Set is selected, simply SELECT the Delete button or PRESS ENTER.

> **NOTE: The UNinstall program will not permit the deletion of a Display Driver set that is currently used.**

To remove an individual driver from a Display Driver Set, complete the following steps:

- 1. SELECT the Display Driver Set .
- 2. Once the desired Driver Set is high lighted, CLICK on the Enter button. This will call up a list of available display drivers.
- 3. SELECT the display driver to be deleted (it will be high lighted) .
- 4. CLICK on the DELETE button or PRESS ALT + D to delete the selected display driver.

WINDOWS 95

DISPLAY DRIVER INSTALLATION

This Windows 95 DirectDraw Display driver provide faster system performance, ability to control your monitor refresh rate, DirectX support, MPEG Player with VIDEO-57P Video acceleration, and other features.

- 1 ENSURE that MS Windows 95 is up and running using the Trident SVGA driver that it has detected.
- 2 INSERT the Video-57P CD into the CD-ROM drive X:, after a moment, the CD with auto-run feature will present you with a welcome screen, SELECT “Display Driver” and proceed to the next step, otherwise, SELECT “Control Panel” from “My Computer”

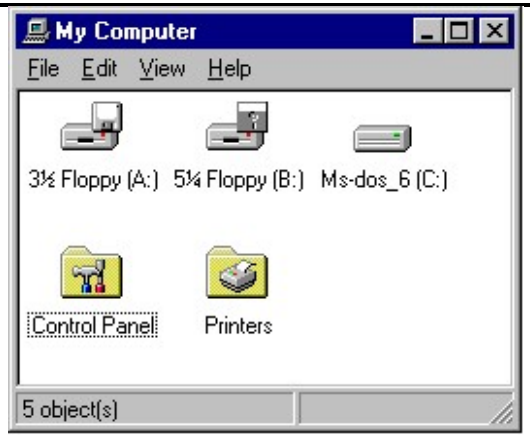


Figure 18

❁ 3 SELECT the “Display” icon and then SELECT the “Settings” page.

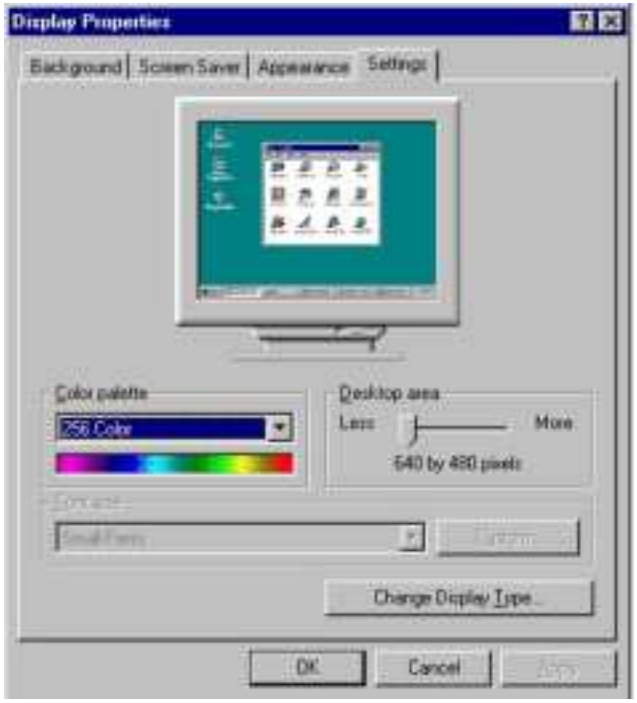


Figure 19

❁ 4 SELECT the “Change Display Type” selection bar, and then SELECT the “Change” button next to Adapter Type.

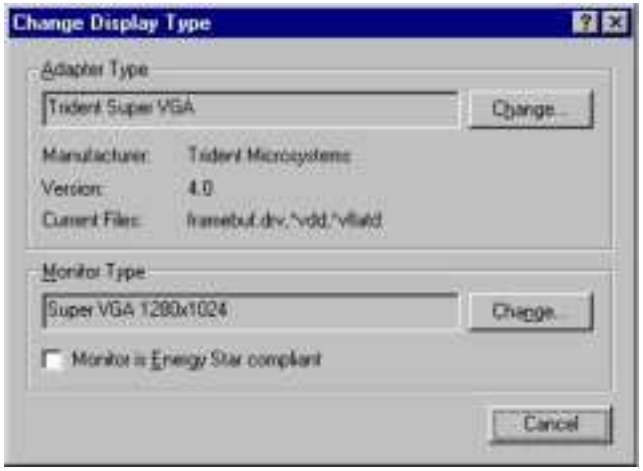


Figure 20

❁ 5 On the “Select Device” page, SELECT the “Have Disk” button to install the Jaton display driver from the VIDEO-57P CD-ROM disc.

Figure 21

❁ 6 After the “Have Disk” button is selected, an “Install From Disk” window will appear.
SELECT the “Browse” button to browse the directory “X:\WIN_95” of your CD-ROM drive.

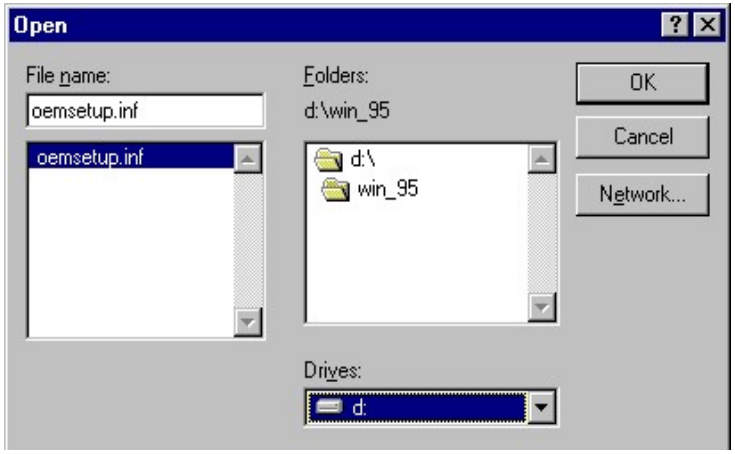


Figure 22

❁ 7 Once the files OEMSETUP.INF appear under file name list.
SELECT “OK” to return to the “Install From Disk” windows.
Under the statement “Copy manufacturer’s files from”, the line X:\WIN_95 should appear.
SELECT “OK” to start copying the driver files.

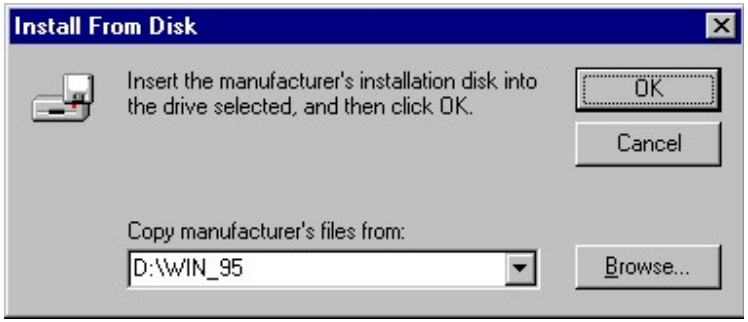


Figure 23

❁ 8. After the files has been copied from the CD-ROM disc to the hard drive, a “Select device” window will appear. Under

Models, the line “Video-57P, linear accelerated for PCI Vx.xx.xx” will now be listed.

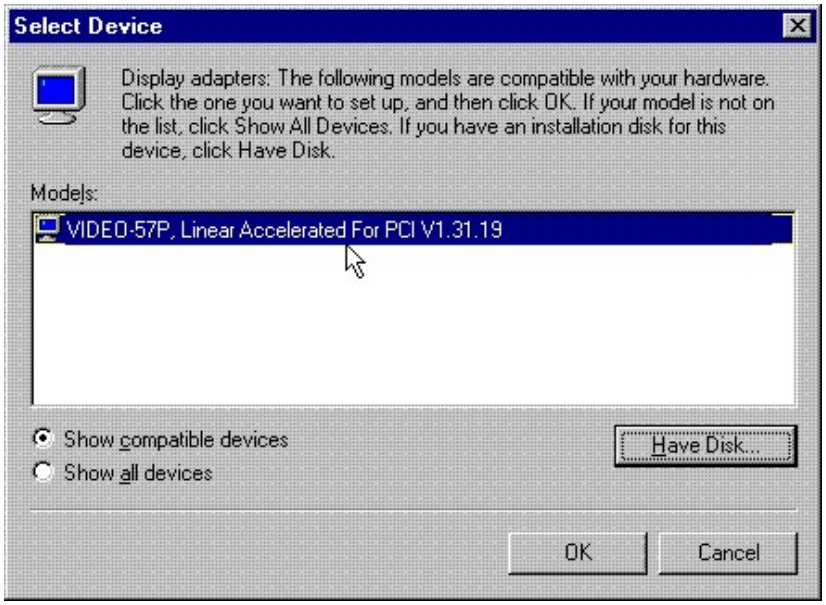


Figure 24

❁ 9. SELECT the “OK” button to close the “Select Device” window and to select the “Color Palette” and “Desktop Area” of your choice under the Jaton Video-57P accelerated driver. Once the desired color palette (the number of colors) and desktop area (resolution) has been chosen, the Windows 95 system will be re-started using the Jaton accelerated driver.

MS WINDOWS NT 3.5

DISPLAY DRIVER INSTALLATION

❁ 1. RUN the Microsoft Windows NT display Setup program located in the Control Panel of the Main group.

❁ 2. SELECT "Change Display Type..." button from the Display Settings options.

❁ 3. SELECT "Change..." button from the Display Type options.

- 4. SELECT "Other..." button from the Select Device options.
- 5. Microsoft Windows NT 3.5 will prompt you for the correct path where the Trident drivers are located. ENTER the path "X:\NT35" replace "X:" with the actual CD-ROM drive letter containing Video-57P CD.
- 6. A list of all Trident drivers will appear, SELECT the resolution and color depth desired.
- 7. RESTART Microsoft Windows NT. The desired Trident driver will then be in effect.

OS/2 WARP

DISPLAY DRIVER INSTALLATION

Before installing Jaton Trident display driver for the first time, the current display type has to be VGA mode. The instructions to return to VGA mode are in the "Recovering from an incorrect display type selection" section of your OS/2 user's manual.

Trident OS/2 display driver is installed by following these simple steps.

- 1. PLACE the VIDEO-57P OS/2 driver diskette into drive X:.
- 2. OPEN an OS/2 full-screen or OS/2 Window session under "Command Prompt" of the System folder.
- 3. SWITCH the current drive to drive X:.
- 4. TYPE the following command: INSTALL.

The Trident LOGO will now appear and a screen that reads "Trident Display Drivers Setting" will appear after that.

DISPLAYING OR CHANGING SCREEN RESOLUTION

This Trident OS/2 Display Drivers utility supports the following resolutions with OS/2. The required memory is shown in parentheses.

640x480x256	800x600x65K
800x600x256	1024x768x65K (2M)
1024x768x256	1280x1024x65K (4M)
1280x1024x256 (2M)	640x480x16.7M
1600x1200x256 (4M)	800x600x16.7M (2M)
640x480x65K	1024x768x16.7M (4M)

The first page of the Trident Display Drivers Settings window is labeled Screen Resolution selection page.

- SELECT the resolution and color depth
- ENABLE/DISABLE virtual screen

The second page is the Monitor Model selection page.

- CLICK on Monitor tab to go to this page.
- POINT to and CLICK on the down arrow button to show a list of monitor models.
- SELECT the monitor model. If you can not find your monitor's model, SELECT "Default".

The third page is the Refresh Rate selection page.

- CLICK on Refresh tab to go to this page.
- The refresh rates displayed are those supported at each resolution by the monitor specified in the Monitor Model selection page.
- You can change the refresh rates by CLICKING on down arrow button and then CLICKING on the desired refresh rate.

The fourth page is Frame Buffer Address selection page. This option is only supported by VESA local bus versions of the graphics adapter.

- CLICK Desktop tab to go to this page.
- POINT to and CLICK the down arrow button to show a list of available frame buffer addresses (in units of Megabytes).
- After the selections, CLICK on the Install button to complete the installation.
- REBOOT OS/2 to have this installation take effect.

SCREEN RESOLUTION CONFIGURATION

1. DOUBLE-CLICK on the Video configuration folder, and then DOUBLE-CLICK on the “Display Setting“ object.
2. To change resolution and/or color depth
   a) CLICK on “Screen“ tab.
   b) SELECT the resolution and color depth.
   c) CLICK on “Set“ button.
3. To enable virtual screen
   a) POINT to and CLICK “Virtual Screen” on the button
4. To change refresh rate
   a) CLICK on Refresh tab.
   b) POINT to and CLICK on the down arrow button.

c) SELECT the refresh rate.
d) CLICK on the “Set“ button to take effect.
e) If you don't want the selected refresh rate, CLICK the Undo button or PRESS the 'U' key to return to previous refresh rate.

- 5. To change frame buffer address (VESA Local Bus Adapter only, not applied here.)

VIRTUAL SCREEN

Virtual screen allows the monitor to display the information of a larger screen within the physical borders of the monitor. On some monitors the display fonts at higher resolutions, such as 1024x768, may be too small to read. If virtual screen is enabled for 1024x768 resolution, the display font will be larger in 640x480 resolution or 800x600 resolution; however, the information displayed will be that of 1024x768 resolution.
To enable virtual screen:

- 1. SET UP the Trident display at a higher resolution, such as 1024x768.
- 2. SHUTDOWN the system and then re-start the system.
- 3. GO into the Video configuration folder and CLICK on the “Display Setting“ object to select the screen resolution page.
- 4. CHOOSE a smaller resolution such as 640x480 and CHECK the line that says "Virtual Screen On".
- 5. CLICK on the "Set" button and the screen will automatically be set to physical screen size of 640x480 with virtual screen size of 1024x768.

Notes:
1. To activate virtual screen, color depth has to be the same for both the physical screen and virtual screen.
2. Virtual screen size has to be larger than physical screen size.
3. If you change the resolution and/or the frame buffer address, you must reboot OS/2 to have the changes take effect.
4. If you decide to change your hardware system configuration, such as upgrading video memory or system memory, you should

   a) Change the resolution to VGA.
   b) Change the hardware configuration.
   c) Re-install the Trident OS/2 Display Drivers.

CHAPTER 5 TROUBLESHOOTING

The following are some recommended steps to take if the display do not operate or not function properly in your system:

1. Check to see if the card is firmly seated in its PCI Bus expansion slot. (Note: Turn the system power off before adjusting the card.)
2. Be sure your monitor is properly connected to the card. Be sure your monitor's pin definition matches the 15-pin VGA connector.

COMMONLY ASKED QUESTIONS

MONITORS

Q. Why does the display shift or change sizes when I switch modes?

A. Some monitors lack auto-sizing features or do not synchronize properly to the display board output. In some cases, refresh rate adjustments may be necessary. Your monitor also has controls to adjust the screen to your preference.

Q. What kind of monitor do I need to display 800x600 or 1024x768 resolution?

A. To display 800x600 resolution at 60Hz refresh, your monitor must be capable of a 35.5KHz 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 1024x768 interlaced, your monitor must be capable of a 35.5 KHz horizontal scan rate (e.g., NEC 3D, Seiko 1430 or 1440). To display 1024x768 non-interlaced (60Hz), your monitor must be capable of a 48.7KHz scan rate (e.g., SonyHG 1304, NEC4D, 5D, Seiko 1450). To display 1024x768 non-interlaced (70Hz), your monitor must be capable of a 56.4KHz scan rate (e.g. NEC 4FG).

Q. What kind of monitor do I need to display 1280x1024 resolution?

A. A 17-inch or larger size monitor is recommended to display 1280x 1024 (e.g. NEC 4FG). The monitor must also be capable of a 47.5 KHz scan rate.

SYSTEMS

Q. Can I have two graphics boards in my system at the same time?

A. A MGA card may co-reside with a the VGA adapter. You cannot have an EGA, CGA, or another VGA card co-resident.

Q. I see "mouse droppings" on the screen when I move my mouse a around. Is this a problem with my mouse?

A. It 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 chips to the card, call technical support to verify they are the correct ones.

SOFTWARE APPLICATIONS

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 should be version 4.6 or later. RIX must be version 1.38 or later. If you are using an earlier version of VPIC, please contact your software vendors for upgrade information.

Q. My display is not correct when I run the Print Preview function for WordPerfect 5.1, File Import/Export function of Applause 1.5, or IBM 3270 Emulation version 2. What's wrong?

A. Try using the utility program called TPATCH. TPATCH provides several patch files to correct screen display problems. You can use TPATCH to correct the display problems in WordPerfect 5.1, Applause 1.5, IBM 3270 Emulation, and others. Please refer to the Software Owner's Manual for details.

TROUBLESHOOTING MS-WINDOWS 3.1X

This section provides troubleshooting tips for users having problems installing or using the high resolution drivers provided for Windows 3.1. Be sure you have installed the TMONITOR and SVM utilities on your hard drive before you continue with the troubleshooting procedures.

NOTE: "Delete driver files" means to delete all previous drivers prior to installing the new ones; i.e., "VDDTVGA.386", "OEM*.INF" files,

all the “MT*.DRV”, “T*.DRV” and “W*.DRV” files in the C:\WINDOWS\ and C:\WINDOWS\SYSTEM directories. Please refer to the README.TXT file in the WIN directory for a complete list of these file names.

Problem: ***Windows screen won’t come up. It kicks back to the DOS prompt.***

Solution A: Ensure the driver version is the correct one for the chipset on your card. Ensure the resolution chosen is a match for the amount of memory on-board. Refer to (open) the README.TXT file in the WIN subdirectory of your Driver/Utility Disk for details on memory requirements.

Solution B: Try adding the statement “EMMEXCLUDE=AOOO-C7FF” to the [386 enhanced] section of the Windows SYSTEM.INI file. The SYSTEM.INI file is located in the WINDOWS\SYSTEM directory.

Solution C: If using QEMM, try adding the following QEMM exclude statement “DEVICE= QEMM386.SYS X=AOOO-C7FF” to your CONFIG.SYS file.

Solution D: Check the CONFIG.SYS and AUTOEXEC.BAT files and minimize TSRs (Terminate and Stay Resident Programs) and Device Drivers such as the following:
DEVICE=TVGABIO.SYS in CONFIG.SYS, or
PCSHELL.EXE in AUTOEXEC.BAT.

Solution E: Delete and reinstall the driver(s). See NOTE above.

Problem: ***Windows hangs up during or after installing a driver.***

Solution A: Reread installation procedures to be sure you have installed the drivers correctly.

Solution B: Did Windows display an error message before hang-up?

If no: Check CONFIG.SYS and AUTOE.XEC.BAT files and minimize TSRs (Terminate and Stay Resident Programs) or Device Drivers, such as, DEVICE=MOUSE.SYS in CONFIG.SYS or PCTOOLS.EXE in AUTOE.XEC.BAT.
You can also type **WIN /?** for a list of options that may help you find the problem.
If SYSTEM .INI (located in the WINDOWS\SYSTEM directory) has been edited, try replacing with a clean version from the original Windows diskettes. (Note: If this is done, any other changes you may have made to SYSTEM.INI will be lost)
Delete and reinstall the driver(s). See **NOTE** on previous page.

If yes: If Windows reports "... file corrupted", be sure you have used the Window system program to install the drivers. Copying the drivers to your Windows directory without using the Windows SETUP will result in a file corruption error. (the files must be expanded as well as copied). If you use the correct setup program and still have problems, delete the driver files from your Windows directory and use a new set of drivers.
If installing on a network via "SETUP/N", you will need to use the "EXPAND" utility (located on original Windows diskettes) to expand the display drivers.

Problem: ***Garbage on the screen or double images.***

Solution A: Use View Option (FS) in the SVM program to verify the problem. See the Software section for more information on the SVM program.

Solution B: If the problem persists, the board may be defective. Contact your dealer for further support.

Problem: ***Windows color palette does not look right or colors changing.***

Solution: Most likely a defective RAMDAC, memory chip, clock chip, or crystal. Contact your dealer to have the problem taken care of.

Problem: ***Can't display certain modes.***

Solution A: Run the SVM program (See the Software section for more information on the SVM program). If the SVM program fails, go to Solutions B, C, and D.

Solution B: Check to see that there is enough memory on the VIDEO-57P board to run this mode. For example, to run display mode 79H (1024x768-64K colors, refer to the tables in Appendix C), 2 MB of display memory is required.

Solution C: Run the TMONITOR program to adjust video parameters (See the Software User's Guide for more information on the TMONITOR program).

Solution D: If Solutions A, B, or C do not resolve this problem, it may be hardware related. Check the specifications of the monitor.

Problem: ***Windows screen size is too tall or too narrow.***

Solution A: Run SVM to verify the problem.

Solution B: Use TMONITOR to adjust screen size.

Solution C: Some monitors have limited bandwidth and the Windows screen size problem may not be corrected completely.

Problem: ***Icons and characters are too small in 1024x768 and 1280x1024 modes.***

Solution: It is normal for icons and characters to become smaller in higher resolutions. Verify you have the Large Fonts installed for larger characters. A 19-inch or larger monitor is recommended for these higher modes.

Problem: ***Mouse doesn't function properly.***

Solution A: Check mouse connection and re-boot the system.

Solution B: Contact mouse vendor for latest version of the mouse driver.

Problem: ***When changing resolutions by running SETUP, the SETUP menu displays more than one selection for the same resolution mode.***

Solution: When upgrading to a new set of Windows drivers, you need to delete the old OEM?.INF (e.g. OEMO.INF) file in the WINDOWS\SYSTEM subdirectory. The SETUP menu will then display only one selection for each resolution mode.

Problem: ***When installing a high resolution display Driver for foreign language Windows 3.1 (i.e. German or French version of Windows 3.1), the SETUP program prompts to insert an incorrect Microsoft Windows 3.1 diskette.***

Solution: Since Microsoft uses a different diskette arrangement for their foreign language Windows 3.1 fonts, the OEMSETUP.INF in the Driver/Utility Disk will prompt for a diskette number that is not correct for the foreign language Windows 3.1.

APPENDIX A - ADVANCED TOPICS

GREEN PC POWER MANAGEMENT

DPMS Power States

State	HSYNC	VSYNC	VCLK*	DCLK*	DAC*
Ready	on	on	on	on	on
Standby	off	on	on	on	off
Suspend	on	off	on	low	off
Off	off	off	off	low	off

*Optional

VESA DPMS (Display Power Management Signaling) decreases monitor power consumption after a predetermined time-out period. Deep Green PC goes beyond the conventional DPMS. The BIOS can automatically turn off the RAMDAC and reduce clocks when DPMS power down states are activated. The TGUI9680 offer read/write access allowing the complete shutdown of graphics subsystem.

BIOS Power-up sequence:

1. Turn on DCLK/VCLK clock synthesizer and wait 1ms
2. Program DCLK rate
3. Select clock synthesizer as source of DCLK
4. Program VCLK rate
5. Turn on HSYNC/VSYNC
6. Turn on DAC
7. Set screen on

BIOS Power-down sequence:

1. Set screen off
2. Turn off DAC
3. Set HSYNC/VSYNC to DPMS desired state
4. Set screen off
5. Turn off VCLK synthesizer
6. Set devisor of external 14.318MHz clock
7. Select external 14.318MHz clock as source of DCLK
8. Turn off DCLK synthesizer

MEMORY UPGRADE

Adding more memory may further enhanced the graphics performance and functionality. There are many types of RAM in the market. They may different in IC package type, data path, and other electronic characteristics.

Usually the smaller RAM chips are packaged in DIP and larger 4MegaBits (256KBit x 16) RAM chips in SOJ. We provide mainly these three types of sockets on board for memory upgrade purpose.

Socket Type	Description	Pins/Leads	RAM Organization
DIP	**D**ual **I**nline **P**ins	20 24	256KBitx4 256KBitx8
SOJ	**S**mall-**O**utline **J**-lead	40	256KBitx16
ZIP	**Z**igzag **I**nline **P**ins	40	256KBitx16

Memory chips are often connected in BANK to provide enough data lines to satisfy the graphics engine's memory bus design. The following table shows the relationship between the total RAM or Banks of different BUS types are formed with the amount of RAM chips indicated in the table.

RAM Total	256KByte	512Kbyte	1MegaByte	2MegaByte
Bank	8Bit Bank	2 8BitBanks	32Bit Bank	64Bit Bank
RAM Size	**Quantity**	**Quantity**	**Quantity**	**Quantity**
256x4	2	4	8	16
256x8	1	2	4	8
256x16			2	4

32-bit memory is mostly utilized in VESA or PCI Local Bus design. From above table, you will find there are three ways to form 1MegaByte 32-bit memory bank: 8 pieces of 256x4, 4 of 256x8, or 2 of 256x16.

The memory chips we used for upgrade are often regular 5-volt Fast Page Mode or EDO DRAM. The 256x16 SOJ FPM DRAM can be generally categorized in three refresh types: Dual CAS, Symmetric Dual Write, and Asymmetric Dual Write. They are often also called 260, 270, and 170 because most memory chip manufactures use these three digits in their chip model number. The table below listed some models of 256x16 SOJ memory from different chip vendors.

256x16 SOJ DRAM Table

Make/Type	Dual CAS (260)	Extnd Data Out (EDO)	Symmetric 2 WE (270)	Asymmetric 2WE (170)
Fujitsu	814260-xx			
Hitachi	HM514260AJX-xx		HM514270AJ-xx	HM514170ALX-xx
Micron Tech	MT4c16257DJ-xx 4P16257DJ-x	MT4c16270-xx	MT4c16256DJ-xx 4P16256DJ-x	MT4c16260DJ-x
Mitsubishi	M5M44260AJ-xx		M5M44270AJ-x	M5M44170AJ-x
NEC	424260-xx		424270-xx	424170-xx
OKI	MSM514260-xx	MSM514265B-xx		
Panasonic	MN414260SJ-xx		MN414270SJ-xx	MN414170SJ-xx
Samsung	KM416C256BJ-x	KM416c254B-x	KM416C156AJ-x	KM416C157AJ-x
Siemens	HYB514171BJ-xx			
TI	TMS45160-xx		TMS45165-xx	
Toshiba	TC514260BJ-xx			
Vitalic	V53C16256HKxx	V53C16258HKxx		

The same refresh type of memory should be used on graphics board. If the first bank of memory on board is 270, then the second bank should use 270. If the first bank is 170, the you must use 170 in second bank. If the first bank is 260, then second bank could be 260 or EDO. If the first bank is EDO, then EDO must be used in the second bank.

Memory speed is usually determined by its access time. 70ns memory are usually used on our board. The same or faster speed (60ns or less) of RAM should be used for additional banks of memory.

To upgrade VIDEO-57P from one(1) to two(2) MegaBytes of display memory, you need two pieces of either 256x16 SOJ EDO or 260 memory depending on the type of memory used in first bank. The memory bus will automatically switch from 32-bit to 64-bit once you have two mega bytes of memory installed.

The above is a just general guideline on upgrading graphics board we make. Please verify the type of DRAM installed on board, then contact your vendor for purchasing the appropriate memory.

APPENDIX B - ADAPTER PINOUT AND SYNC

CONNECTOR INFORMATION

IMPORTANT
The VIDEO-57P board uses the same 15-pin (DB15) cable available from monitor manufacturers to interface with the IBM PS/2 computers. Using an incorrect cable may result in damage to the monitor and/or adapter.

ANALOG COLOR DISPLAY PINOUTS

Table 2 lists the GUI accelerator analog color display pinouts.

Table 2. Analog Color Display Pinouts

Pin	Function
1	Red Video[1]
2	Green Video[1]
3	Blue Video[1]
4	Not Used
5	Ground
6	Red Return (ground)
7	Green Return (ground)
8	Blue Return (ground)
9	Vcc (DDC Power +5v)
10	Sync Return (ground)
11	Monitor ID (not used)
12	SDA (DDC support)
13	Horizontal Sync
14	Vertical Sync
15	SCL (DDC support)

Note: Analog monochrome type monitors use green video for all video input and ignore red and blue video.

CONVERSION TABLE: PIN ADAPTERS

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 3 carefully before you install the cable. 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 Signals	Pin No.	15 pin Signals	Pin no.
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

ANALOG VIDEO SIGNALS

Black Level = 0 V
Full Intensity Level = +0.7 V

VESA FEATURE CONNECTOR

Number	Description	Number	Description
1	P0	14	Ground
2	P1	15	Ground
3	P2	16	Ground
4	P3	17	EVIDEO
5	P4	18	E. Sync
6	P5	19	E. DCLCK
7	P6	20	Vcc
8	P7	21	Ground
9	DCLCK	22	Ground
10	BLANK#	23	Ground
11	H. Sync	24	Ground
12	V. Sync	25	MCLK(optional)
13	Ground	26	OVRW(optional)

APPENDIX C - DISPLAY MODES

The adapter supports a variety of video modes (standard VGA and higher resolution) which are accessible through a video BIOS call from assembly language or other higher-level programming languages.
When you start-up in DOS, the screen display defaults to the standard 80-column text or alpha-numeric mode. This is mode 3 on a color system, or mode 7 on a monochrome VGA.

GRAPHIC MODE SUPPORT

Your monitor must be capable of displaying the graphic/text mode you choose. The following tables list all available display modes and related information for the adapter.
Note that the total number of possible colors to choose from is 16,777,216 in all modes except for monochrome modes (designated with the letter 'M'), where the color palette is two (black and the monitor phosphor color). For example, in mode 62 (1024x768-256 colors), the total colors available for display on the monitor at one time is 256 different colors from a total of 16,777,216. In mode 6C (640x480-16M colors), the total number of colors available for display on the monitor at one time is 16,777,216; i.e., 24 bit true color.

Table 1: Graphic Mode (Standard) Cross Reference

Grp #	Mode #	Resolution -Colors	Horz KHz	Vert Hz	Mem Req.	Text Res	Mode Type	Scan Type
0	0h,1h	320x200-16	31.4	70	1M	40x25	Text	NI
0	2h,3h	640x200-16	31.4	70	1M	80x25	Text	NI
0	4h,5h	320x200-4	31.4	70	1M	40x25	Graph	NI
0	6h	640x200-2	31.4	70	1M	80x25	Graph	NI
0	7h	720x350-M	31.4	70	1M	80x25	Text	NI
0	Dh	320x200-16	31.4	70	1M	40x25	Graph	NI
0	Eh	640x200-16	31.4	70	1M	80x25	Graph	NI
0	10h	640x350-16	31.4	70	1M	80x25	Graph	NI
0	11h	640x480-2	31.4	60	1M	80x30	Graph	NI
0	12h	640-480-16	31.4	60	1M	80x30	Graph	NI
0	13h	320x200-256	31.4	70	1M	40x25	Graph	NI

Table 2: Graphic Mode (extended) Cross Reference

Grp #	Mode #	Resolution -Colors	Horz KHz	Vert Hz	Mem Req	Text Res	Mode Type	Scan Type
0	50h	640x480-16	31.5	60	1M	80x30	Text	NI
0	51h	640x473-16	31.5	60	1M	80x43	Text	NI
0	52h	640x480-16	31.5	60	1M	80x60	Text	NI
0	53h	1056x350-16	31.3	70	1M	132x25	Text	NI
0	54h	1056x480-16	31.3	60	1M	132x30	Text	NI
0	55h	1056x473-16	31.3	60	1M	132x43	Text	NI
0	56h	1056x480-16	31.3	60	1M	132x60	Text	NI
0	57h	1188x350-16	31.3	70	1M	132x25	Text	NI
0	58h	1188x480-16	31.3	60	1M	132x30	Text	NI
0	59h	1188x473-16	31.3	60	1M	132x43	Text	NI
0	5Ah	1188x480-16	31.3	60	1M	132x60	Text	NI
3	5Bh_3	800x600-16	53.7	85	1M	100x75	Graph	NI
2	5Bh_2	800x600-16	46.8	75	1M	100x75	Graph	NI
1	5Bh_1	800x600-16	37.8	60	1M	100x75	Graph	NI
0	5Ch	640x400-256	31.6	70	1M	80x25	Graph	NI
3	5Dh_4	640x480-256	43.2	85	1M	80x30	Graph	NI
2	5Dh_3	640x480-256	37.5	75	1M	80x30	Graph	NI
1	5Dh_2	640x480-256	37.8	72	1M	80x30	Graph	NI
0	5Dh_1	640x480-256	31.4	60	1M	80x30	Graph	NI
3	5Eh_3	800x600-256	53.7	85	1M	100x37	Graph	NI
2	5Eh_2	800x600-256	46.8	75	1M	100x37	Graph	NI
1	5Eh_1	800x600-256	37.8	60	1M	100x37	Graph	NI
4	5Fh_4	1024x768-16	60.4	75	1M	128x48	Graph	NI
3	5Fh_3	1024x768-16	56.4	70	1M	128x48	Graph	NI
2	5Fh_2	1024x768-16	48.5	60	1M	128x48	Graph	NI
1	5Fh_1	1024x768-16	35.5	87i	1M	128x48	Graph	I

Table 2: Graphic Mode (extended) Cross Reference

Grp #	Mode #	Resolution -Colors	Horz KHz	Vert Hz	Mem Req	Text Res	Mode Type	Scan Type
4	62h_4	1024x768-256	60.0	75	1M	128x48	Graph	NI
3	62h_3	1024x768-256	56.4	70	1M	128x48	Graph	NI
2	62h_2	1024x768-256	48.3	60	1M	128x48	Graph	NI
1	62h_1	1024x768-256	35.5	87i	1M	128x48	Graph	I
6	63h_3	1280x1024-16	80.0	75	1M	160x64	Graph	NI
4	63h_2	1280x1024-16	63.9	60	1M	160x64	Graph	NI
2	63h_1	1280x1024-16	46.4	87i	1M	160x64	Graph	I
6	64h_3	1280x1024-256	80.0	75	2M	160x64	Graph	NI
4	64h_2	1280x1024-256	63.9	60	2M	160x64	Graph	NI
2	64h_1	1280x1024-256	46.4	87i	2M	160x64	Graph	I
4	65h_1	1600x1200-16	62.5	96i	1M	160x64	Graph	I
4	66h_1	1600x1200-256	62.5	96i	4M	160x64	Graph	I
1	6Ah_1	800x600-16(5b1)	37.8	60	1M	100x75	Graph	NI
3	6Ch_4	640x480-T	43.2	85	1M	80x30	Graph	NI
2	6Ch_3	640x480-T	37.5	75	1M	80x30	Graph	NI
1	6Ch_2	640x480-T	37.8	72	1M	80x30	Graph	NI
0	6Ch_1	640x480-T	31.4	60	1M	80x30	Graph	NI
0	6Ch_0	640x480-T	31.4	60	2M	80x30	Graph	NI
2	6Dh_1	800x600-T	46.8	75	2M	100x37	Graph	NI
1	6Dh_0	800x600-T	37.8	60	2M	100x37	Graph	NI

Table 2: Graphic Mode (extended) Cross Reference

Grp #	Mode #	Resolution -Colors	Horz KHz	Vert Hz	Mem Req	Text Res	Mode Type	Scan Type
1	6Eh	1024x768-T	35.5	87i	4M	128x48	Graph	I
3	74/5h_4	640x480-32K/64	43.2	85	1M	80x30	Graph	NI
2	74/5h_3	640x480-32K/64	37.5	75	1M	80x30	Graph	NI
1	74/5h_2	640x480-32K/64	37.8	72	1M	80x30	Graph	NI
0	74/5h_1	640x480-32K/64	31.4	60	1M	80x30	Graph	NI
3	76h/7_4	800x600-32K/64	53.7	85	1M	100x37	Graph	NI
2	76h/7_3	800x600-32K/64	46.8	75	1M	100x37	Graph	NI
1	76h/7_2	800x600-32K/64	37.8	60	1M	100x37	Graph	NI
4	78h/9	1024x768-32K/64	60.0	75	2M	128x48	Graph	NI
2	78h/9	1024x768-32K/64	48.3	60	2M	128x48	Graph	NI
1	78h/9	1024x768-32K/64	35.5	87i	2M	128x48	Graph	I
2	7Ah/B	1280x1024-32K/64	46.4	87i	4M	160x64	Graph	I

(I) Interlaced

(NI) Non-interlaced