



Cardinal®

Cardinal Technologies, Inc.

SNAPplus

User's Manual

- Compatible with standard PC text and graphics software.
- Industry standard RGB-video, S-Video and composite-video inputs (PAL or NTSC)
- Industry standard RGB-video, S-Video, composite-video and VGA video outputs. NTSC output is enabled when running 640x480 graphics mode only.
- Live or still video frame grabbing – up to 640x480 in 16,777,216 colors.
- High performance 16 bit bus interface.
- Easy to use – requires no significant training.

SNAPplus Desktop Video Adapter

Disclaimer

Cardinal® Technologies Inc. provides this publication **as is** without warranty of any kind, either expressed or implied, including but not limited to, the implied warranties of merchantability or fitness for any particular purpose. Further, Cardinal Technologies Inc. reserves the right to revise this publication and to make changes from time to time to the content hereof without obligation of publisher to notify any person of such revision or changes. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

Trademarks

The Cardinal® logo is a registered trademark and SNAPplus™ is a trademark of Cardinal Technologies, Inc.. GEM and Desktop Publisher are trademarks of Digital Research Inc. IBM PC/XT, PC/AT and PS/2 Model 35 are registered trademarks of International Business Machines Corporation. WordPerfect is a registered trademark of WordPerfect Corporation. AutoCAD and AutoShade are registered trademarks of AutoDesk Inc.. OS/2, Microsoft and Microsoft Windows are registered trademarks of Microsoft Corporation. Lotus 1-2-3 and Symphony are registered trademarks of Lotus Development Corporation. Ventura is a registered trademark of Ventura Software, Inc.. Tseng Labs is a registered trademark of Tseng Labs, Inc.. All other names and logos are trademarks or registered trademarks of their respective companies.

Copyright

Copyright © 1994 Cardinal Technologies, Inc.. All rights reserved. No part of this publication may be reproduced, or distributed without the prior written permission of Cardinal Technologies, Inc..

Warranty

Cardinal Technologies, Inc.. provides a one year warranty for this product. So that we may serve you promptly and with quality service please take the following steps:

Save your purchase receipt.

Save the box, packing material and static protection material.

Please fill out and return the Registration Card, located in the back of this manual.

If you need technical assistance please refer to: *Preparing Your Product for Servicing*, located in the back of this manual.

Table of Contents

1. Introduction	1
1.1 Features	1
1.2 Standard Items	2
1.3 Optional Items	2
2. Hardware Installation	3
2.1 Switches and Jumpers	3
2.2 Installation Procedure	5
2.3 Connecting Cables	7
2.4 Setup and Testing	9
2.4.1 Testing Video Input	9
2.4.2 Testing Video Output	9
3. The SNAPshot Desktop Video Software	11
3.1 Getting Started With SNAPshot	11
3.2 SNAPshot Quick Start	12
4. File Menu	13
4.1 New	13
4.2 Preferences	13
4.2.1 Change Device Assignments	14

4.3 Open	14
4.3.1 Choosing a File Format	14
4.4 Close	16
4.5 Save	16
4.6 Save As	16
4.7 Grab Full Frame	16
4.8 Exit	16
5. Overlay Menu	17
5.1 Set Color Key	17
5.2 Set Video Window	17
5.3 Move Video Window	17
5.4 Pan Video	18
5.5 Color Key	18
5.6 Video Window	18
5.7 Freeze Frame	18
5.8 Live Action	18
6. View Menu	19
6.1 Fit In Video Window	19
6.2 Fit In Client Window	19
6.3 Full Frame Video	19
6.4 Full Screen Preview	19

7. Animation Menu	21
7.1 Load In Memory	21
7.2 Loop Frame	22
7.3 Full Screen	22
7.4 Hide Animation	22
7.5 Color Cycling OK	22
7.6 Use All Colors	22
7.7 Settings	23
7.7.1 Speed Units	23
7.7.2 Speed	23
7.7.3 Lock	23
7.7.4 Loop: Frames	24
7.7.5 Duration	24
7.7.6 Repeat Sound	24
7.7.7 Delay Sound	24
7.7.8 Pause at End	24
7.7.9 Test	24
7.7.10 Cancel	25
7.8 Transition Settings	25
7.8.1 Cut	25
7.8.2 Fade to Black	25
7.8.3 Fade to White	25
7.8.4 Transition Length	25

8. Control Menu	27
8.1 Video Control Panel	27
8.2 Animation Control Panel	27
9. SNAPshot Ribbon Panel	29
10. Effects Menu	31
10.1 Gray Scale	31
10.2 Negative	31
11. Drivers	33
11.1 Extended Mode Drivers	33
11.2 Additional Driver Support	33
11.3 The SETUP Program	34
11.3.1 Using SETUP	34
12. Utility Programs	35
12.1 EANSI.SYS	35
12.1.1 Installing EANSI.SYS	35
12.2 The FASTBIOS Accelerator Utility	36
12.2.1 Installing the FASTBIOS	36
12.3 Screen Center Utility	37
12.3.1 Installing the Screen Center Utility	37
12.4 The Diagnostics Utility	38
12.4.1 Installing the Diagnostics Utility	39
12.5 The Video Mode Selection Utility	40

12.5.1	Installing the Video Mode Selection Utility	40
12.5.2	Running VMODE	41
12.5.3	Refresh Rate Selection	42
12.6	Text Mode Selection	45
13.	The Enhanced Mode Drivers	47
13.1	Monitor Compatibility	47
13.2	The VESA High Resolution Drivers	48
13.2.1	Installing the VESA Drivers	48
13.3	The 8514/A Drivers	49
13.3.1	Installing the 8514/A Drivers	49
14.	The Lotus 1–2–3 Drivers	51
14.1	Installing the Lotus Drivers	51
15.	The Microsoft Windows Drivers	53
15.1	Windows 3.1 Drivers	53
15.1.1	Installing the Windows 3.1 Drivers	53
15.2	The Microsoft Windows 3.0 Drivers	54
15.2.1	Installing the Windows 3.0 Drivers	54
16.	The AutoCAD 10.0 Drivers	55
16.1	Installing the AutoCAD 10.0 Driver	55
16.2	Installing AutoShade	56
16.3	Using the AutoCad 9.0/10.0 Driver	56

17. The AutoCad DLD–386 Driver	57
17.1 Features	57
17.2 System Requirements	57
17.3 Configuring DLD–386 VGA	57
17.4 Installing the DLD–386 Drivers	58
17.5 Changing Colors	62
17.6 Advanced Features	65
17.6.1 Memory Meter	66
17.6.2 Display List Cleanup	66
17.6.3 Current Color/Layer Indicator	66
17.7 Memory Usage and Lists	67
17.8 The Remove/Overwrite Option	68
17.8.1 VIEWing the Full Drawing	69
17.8.2 Avoiding Accidental REGEN's	70
17.8.3 Adding DLDCLEAN to your Pull–downs	70
17.9 Using 3D Studio and AutoShade 2.0	71
17.9.1 AutoShade 2.0 with RenderMan	71
17.9.2 Autodesk 3D Studio	71
18. The Ventura 2.0 Drivers	73
18.1 Installing the Ventura 2.0 Drivers	73
19. The GEM 3.0/3.1 Drivers	75
19.1 Procedure for a single drive system.	75
19.2 Procedure for a dual drive system.	77
20. The WordPerfect 5.0/5.1 Option and Driver	79
20.1 Installing the WordPerfect Drivers	79

21. The OS/2 Presentation Manager Drivers	81
21.1 Installing the OS/2 Drivers	81
22. Video Tutorial	83
22.1 Definition of Terms	83
22.2 NTSC vs. PAL	84
22.3 Non-Interlacing vs. Interlacing	84
22.4 Write-protected VCR Tapes	84
23. Technical Description	85
24. Appendix	89
Specifications	89
Options	90
Pin Descriptions	91
SNAPplus MCI Drivers	92
SNAPplus AVI Drivers	98

Figures

Figure 1 – IRQ Jumper P12	4
Figure 2 – Jumper Re-positioning	4
Figure 3 – Zero Wait State Jumper P11	4
Figure 4 – PC Cover Removal	5
Figure 5 – Dust Cover Removal	5
Figure 6 – Card Installation	6
Figure 7 – S-Video Cable	7
Figure 8 – Composite Video Cable	7
Figure 9 – Connector Insertion	7
Figure 10 – Equipment Hook-up Scheme; Sample	8

Tables

Table 1 Standard Operating Modes	43
Table 2 Enhanced Operating Modes	44
Table 3 High Color Operating Modes	45

1. Introduction

1.1 Features

The SNAPplus Desktop Video Adapter completes the previously missing link between the video and computer (analog and digital) worlds by capturing live or still video on a PC monitor or TV screen. With this product, video from Camcorders or VCRs can be displayed and edited on PCs while PC graphics can be displayed on TV monitors or recorded on VCRs. Moreover, video and graphics from both sources can be merged. The SNAPplus Desktop Video Adapter is compatible with the IBM PC/AT, the PS/2 Model 35 or any 100% compatible computer.

The SNAPplus Desktop Video Adapter is a bridge between several different video standards. The card accepts composite, S-Video or RGB inputs at NTSC or PAL frequencies and outputs composite, S-Video or RGB signals at NTSC rates. A built-in VGA graphics controller originates PC graphics video, and the video output is a mix of the incoming video and graphics, eliminating additional graphics card adapters.



Note on Copyright:

Television programs, films, video tapes and any other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provisions of the copyright law.



- Compatible with standard PC text and graphics software.
- Easy to use – requires no significant training.
- Industry standard RGB-video, S-Video and composite-video inputs (PAL or NTSC)
- Industry standard RGB-video, S-Video, composite-video and VGA video outputs. NTSC output is enabled when running 640x480 graphics mode only.
- Robust GENLOCK – compatible with SVS (Still Video System) products, cameras, VCRs etc.
- Live or still video frame grabbing – up to 640x480 in 16,777,216 colors.
- Live or still video scaling and zooming.
- Built-in VGA graphics controller.
Maximum resolution of 800x600 in 32,768 or 65,536 colors.
Maximum resolution of 1024x768 in 256 colors.
Maximum resolution of 1280x1024 in 16 colors
- High performance 16 bit bus interface.
- DOS and Windows 3.0/3.1 drivers included.
- Single card compatible with PC/AT and PS/2 Model 35 computers.

1.2 Standard Items

- SNAPplus Desktop Video Adapter
- Composite–Video Input/Output Cable
- S–Video Input/Output Cable
- SNAPplus User’s Manual
- REELtime User’s Manual
- SNAPShot/SNAPTest Diskette
- SNAPplus Drivers Diskette; includes MCI and AVI drivers
- SNAPplus Windows 3.1, 3.0 Driver Diskette
- Demo Diskette

1.3 Optional Items

- One Input/Output cable kit, consisting of:
 - One BNC type RGB–video cable
 - One D–sub type RGB video cable
 - One S–Video cable
 - One composite–video cable
 - A software developer’s kit – SDK

With the optional RGB–video, S–Video and composite–video cables the SNAPplus’ video inputs and outputs can be connected to video input/output devices. These connectors are all industry standard types.

2. Hardware Installation

To achieve optimum performance you must have:

- An 80286 or better PC.
- 2Mb (or greater) of RAM.
- 1.44Mb 3.5" diskette drive.
- 80Mb hard drive (or larger).
- A VGA (Video Graphics Adapter) or an analog multi-synchronous color monitor.



Warning

The SNAPplus comes packed in a protective anti-static foam tray.

Do not remove the card from

the tray until you are ready to configure and install it. Electrostatic discharge can cause damage to the card. Handle the card only by its edges and mounting bracket. **DO NOT TOUCH** the edge connector or any of the integrated circuits.



2.1 Switches and Jumpers

For this discussion, please refer to the illustrations on the next page, for further details.

Switch module SW1 contains four separate switches, which have been factory set to OFF; **do not** move them!

Jumper P11 controls the zero wait state. When zero wait state is enabled bus operations are completed faster than under normal conditions, resulting in faster graphics speeds. Zero wait states are not supported on all motherboards; if your motherboard falls into this category leave the jumper in the disabled position (**default**); see Figure 3.

Jumper P12 is used to configure interrupts. IRQ11 (**default**), IRQ12 or no interrupts are available, see Figure 1. Most software does not require that interrupts be set; however, if you use the AVI drivers you should set P12 (see page 98.) If your software requires a specific interrupt, move the jumper to the correct position.

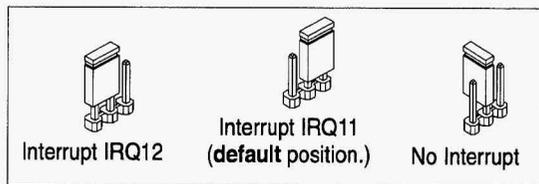


Figure 1 – IRQ Jumper P12

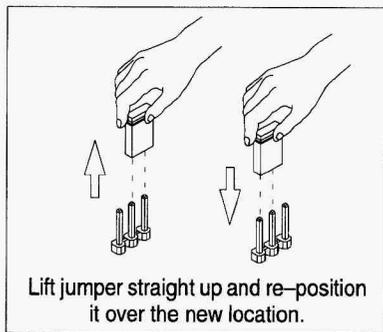


Figure 2 – Jumper Re-positioning

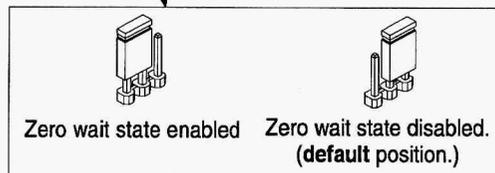
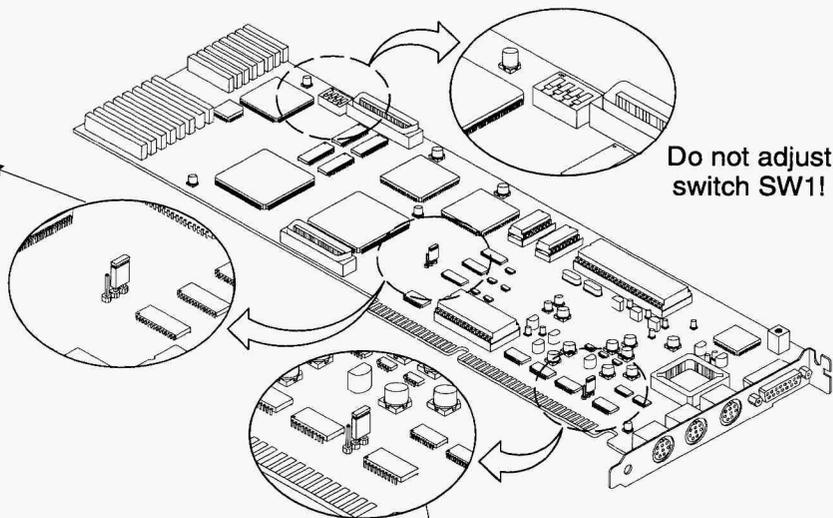
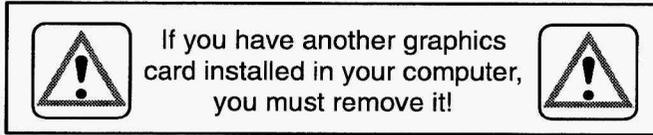


Figure 3 – Zero Wait State Jumper P11

2.2 Installation Procedure



1. **TURN OFF** the computer and disconnect it from the power source.
2. If the computer's motherboard has a built-in graphics controller, it must be disabled, please refer to the computer's user manual.
3. Remove the cover from your computer to access the card expansion slots.

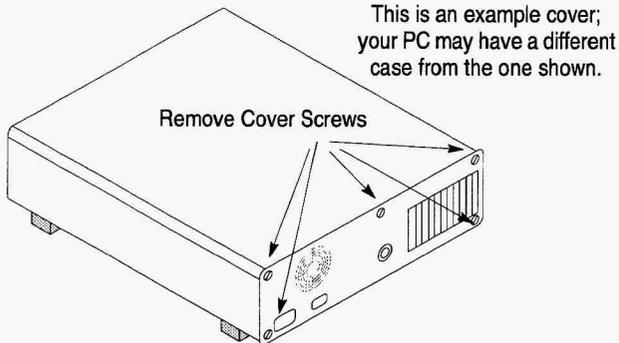


Figure 4 – PC Cover Removal

4. Select an empty **16-bit slot**, one with two card edge sockets. It is best to locate the card as far as possible from any other cards, disk drives or the power supply to reduce electrical noise and interference. Rearrange existing cards if necessary.

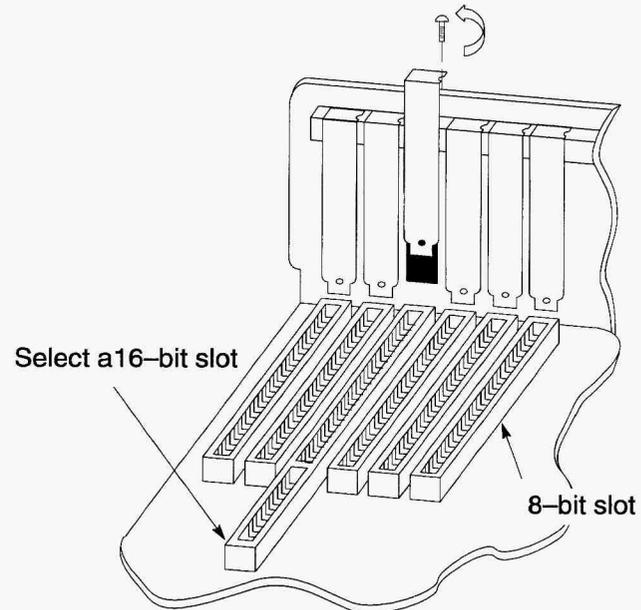


Figure 5 – Dust Cover Removal

5. Remove the slot's dust cover and save the screw.
6. Remove the SNAPplus Desktop Video Adapter from its antistatic packing box.

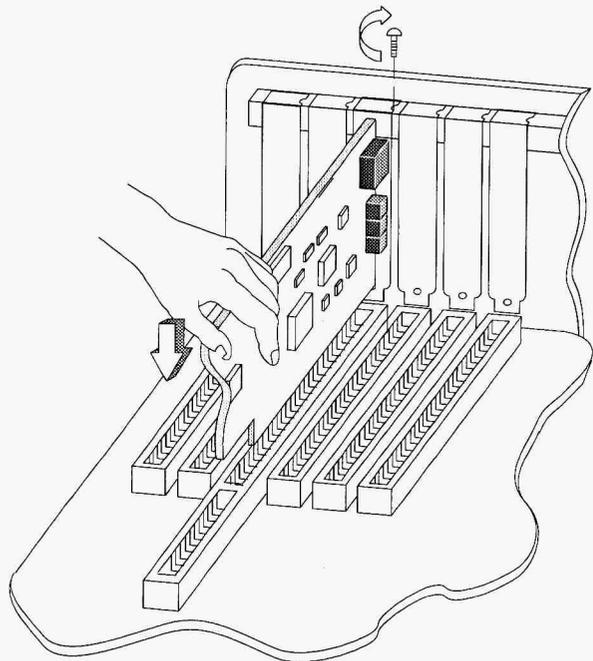


Figure 6 – Card Installation

7. Carefully pick up the SNAPplus Desktop Video Adapter by its top edge. Line up the card with the card guide and the expansion slot openings. Firmly slide the card into the slots and make sure the card is completely seated in the sockets. If the card will not slide in smoothly, do not force it. Make sure the card is lined up properly, and try again. You may need to loosen the adjacent slot's cover to make the card fit properly.
8. Use the retaining screw, that was removed in step 5, to secure the card's bracket to the chassis.
9. Replace the computer cover; refer to your computer User's Manual if you need assistance

Note:

Some computers have a Graphics Controller built into the motherboard. If your PC has that option you may have to change switch settings on the motherboard; use the setting for Video Graphics Adapter (VGA) or Enhanced Graphics Adapter (EGA.) Refer to your Computer's User manual for configuration information.

2.3 Connecting Cables

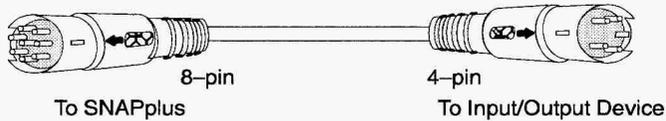


Figure 7 – S-Video Cable

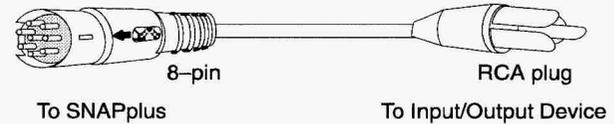


Figure 8 – Composite Video Cable

2

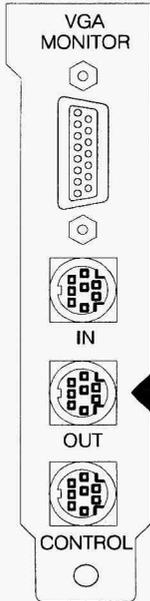
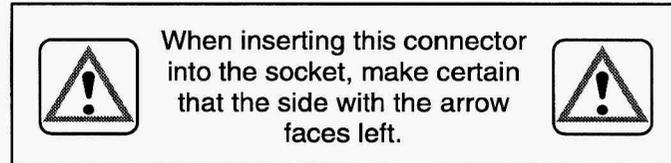


Figure 9 – Connector Insertion

Every cable (except the monitor cable) is terminated on one end with an 8 pin connector, the other end is terminated with a 4-pin connector or an RCA plug. The 8-pin connector plugs into the SNAPplus card and the 4-pin/RCA connector plugs into an Input/Output device, such as a Camcorder, a VCR or a Digital Camera, etc.

When you plug these connectors into the SNAPplus' sockets be especially careful to observe the direction of the connector; the arrow **must** face left, see Figure 8. These connectors are very delicate, please use care when you insert them, do not force them into the socket. Gently align the pins of both connector and socket, before you attempt insertion.

Once the card has been installed, the various cables can be connected.



2

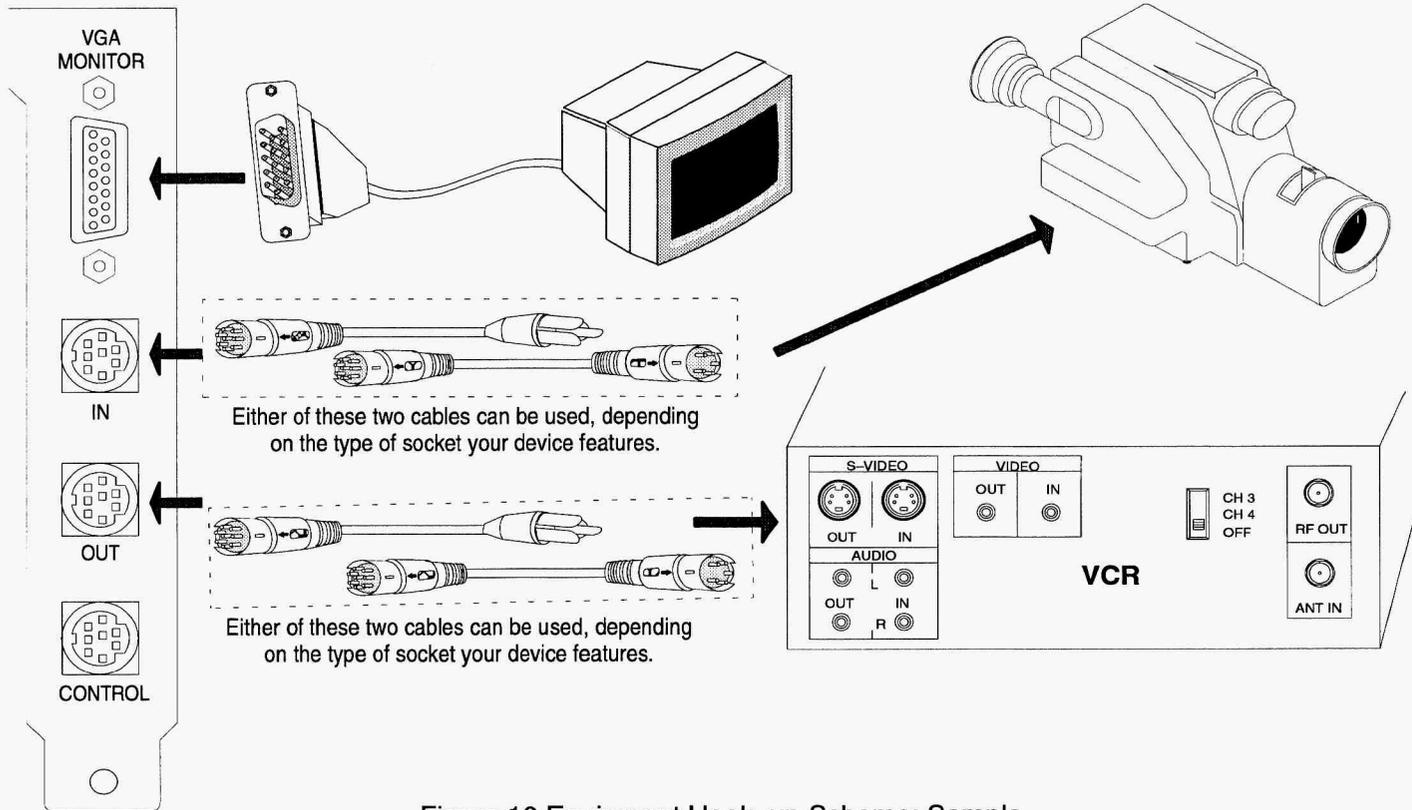


Figure 10 Equipment Hook-up Scheme; Sample

2.4 Setup and Testing

An on-board test program can be used to quickly verify system operation. Before running the test program please make certain that:

- All required cables and auxiliary video equipment are attached.
- Verify that all systems power up normally. Make certain that the computer is in the DOS environment; not in Windows or OS/2.

2.4.1 Testing Video Input

1. Provide a video signal to the SNAPplus Desktop Video Adapter.
2. Insert the diskette labeled **SNAPshot/SNAPtest** into the drive; the assumption is that drive **a:** will be used.
3. Type:
a:snaptest -in Press: **Enter**
4. If the video input selection (shown at the bottom of the VGA screen) is not correct, press the **SPACE** bar until the proper video input is selected, i.e. Composite-video, S-Video or RGB-video.
The monitor will display a digitized replica of the image provided by the external device.

5. To exit press any key
If you desire to save the image in a file on the hard disk drive for later use, begin step 3 above with:

a:snaptest -in <filename>; filename is a name you choose.

The generated file will be in 16-bit Targa format (a true color file format, widely used by graphics developers) and will be given a .tga suffix.

6. To get out of Test: Press: **Esc**

2.4.2 Testing Video Output

1. Type:
a:snaptest -out Press: **Enter**
2. The monitor and the auxiliary video output device will display a standard color bar pattern. Verify that this pattern matches on both monitors.
3. To exit press any key
If you have a 640x480, 16-bit Targa file, you can display it on the VGA monitor and on the auxiliary video output device by typing:
a:snaptest -out <filename>; filename is the name, minus the .tga suffix, of the 16-bit Targa file.

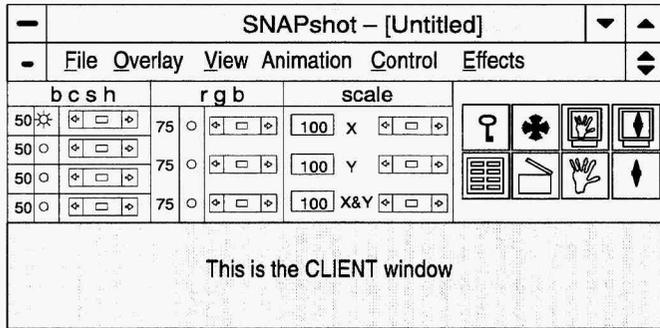
3. The SNAPshot Desktop Video Software

SNAPshot is a utility program written for the Windows 3.1/3.0 environment. It can capture images from any video source, be it live video or still images, and display them on a VGA monitor or store them on hard disk. Images can be scaled, positioned, processed or overlaid with computer graphics. Furthermore, animated images, generated via popular animation programs, can be integrated into live, or still video.

3.1 Getting Started With SNAPshot

1. Make certain that you have the **Windows 3.1 driver** installed and set for 32,768 colors; the Windows 3.1 drivers are included in this package. If you have not yet installed them, do it now; see instructions on page 53.
2. Create a directory on your hard drive and call it snapshot.
Example: C:> **md snapshot** (Press: **Enter**)
3. Copy all files on the SNAPshot/SNAPtest diskette to the snapshot directory; we assume you are using drive a:
Example: C:> **copy a:.* c:\snapshot**
(Press: **Enter**)

4. Go into **Windows**; double-click on the Program Manager icon.
5. Click on **NEW** to create a new program group.
6. In the Description field type: **SNAPplus**. You can leave the Group File field blank.
7. Click on **OK** to create a new Windows folder called **SNAPplus**.
8. With the SNAPplus folder open, click on **NEW** to create a new program item.
9. In the Description field type: **SNAPshot**
10. In the Command Line field type: **c:\snapshot\snapshot.exe**
11. Click on **OK** to create a new program item.
12. The SNAPshot TV icon should now appear in the SNAPplus group.
13. To use the SNAPshot program simply double click on the SNAPshot icon and the basic **SAPshot** window will appear.



The top most bar displays the type of file you will be working with. The second bar lists the various system menus that are available; see descriptions on the following pages. Below is the ribbon panel, which can be used to adjust picture quality and window scale. The symbol icons on the right can be used to activate certain functions; see **SNAPshot Ribbon Panel** on page 29 for details.

3.2 SNAPshot Quick Start

If you want a quick demonstration of the SnapShot Desktop Video software, proceed as follows:

1. Verify that a video source is connected to the SNAPplus video input connector.

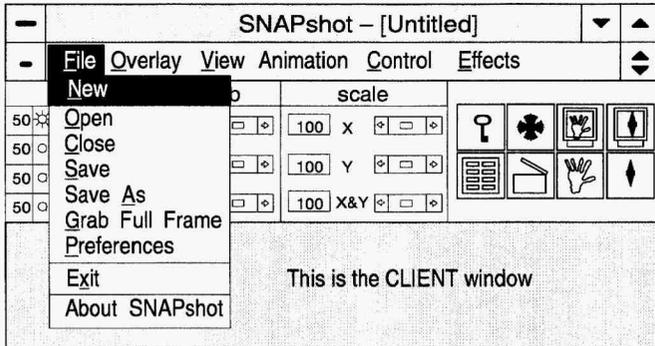
2. If the SNAPshot program is not already running, start it by double-clicking on the SNAPshot icon.
3. From the FILE pull down window, select **Preferences**.
4. Within the **Preferences** box, select the video input, i.e. RGB, S-Video or Composite Video. In addition, select the video frequency, i.e. NTSC or PAL.
5. Close the **Preferences** box, by clicking on **OK**.
6. From the **OVERLAY** pull down window, select **Set Video Window**.
7. Position the mouse in the blank section of the screen; this is known as the client window. While holding the mouse key move the mouse, to create a window area. The video input should be visible in the opened up window, provided the video source is supplying video. Release the mouse key.
8. Adjust the slide buttons in the Ribbon Panel area for optimum image quality.
9. From the **VIEW** pull down window, select **Full Frame Video**. The video input should now fill the entire screen. Press the mouse key to exit back to normal mode.
10. From the **OVERLAY** menu, select the **Set Video Window** menu item; the video window should now disappear.

4. File Menu

The File pull down menu contains general commands for opening and saving files, clearing the client area, changing file names, setting up the working preferences and exiting the program.

4.1 New

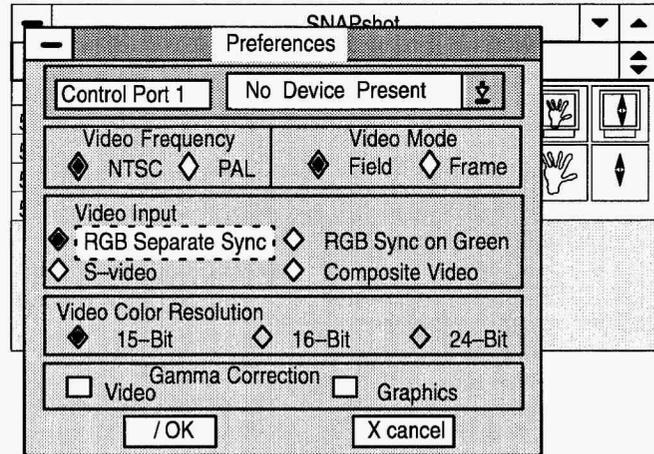
Clicking on **New** clears the current window(s) and frees up the memory associated with these windows. If you have loaded an image and have not saved it prior to selecting **New**, you will be asked if you would like to save it; see **Save As** on page 16. You do not need to select **New** each time you want to load a new image; you can do this simply by selecting **Open**; see page 14 for a description.



4.2 Preferences

The preferences have to be set to select various video parameters. Move the arrow to the **Preference** icon bar and click on it. These values are stored in a file after each time they are set. Therefore, they only need to be changed if your working setup has changed or if you exit the program. The **Preferences** dialog box will appear:

4



To set the various options, simply click on either the word, i.e., S-video, or on the icon next to the word. You will see that either this icon  or that icon  gets activated. To execute your selections click on the **cancel** icon. If you decide to cancel the entire window click on the **OK** icon.

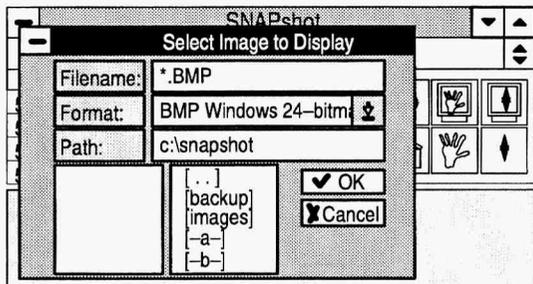
4.2.1 Change Device Assignments

4

To change device assignments click on the arrow of this **No Device Present**  icon. A sub-window will appear, listing the devices currently supported. To activate simply click on the device name. Currently only Port 1 is supported and that is through COM2 on the PC.

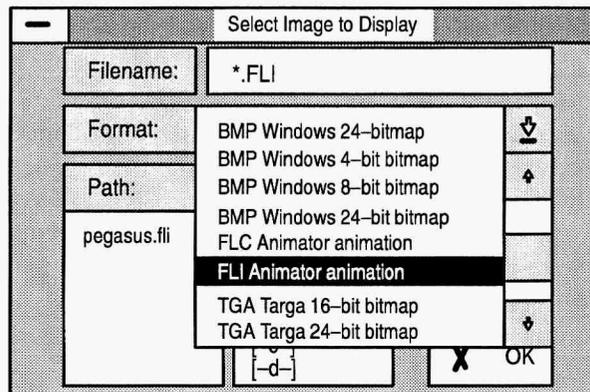
4.3 Open

Select **Open** and a dialog box for selecting files will appear.

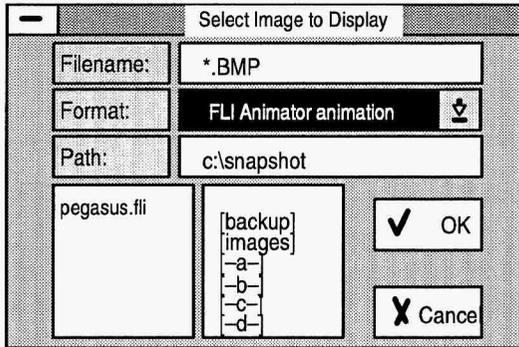


4.3.1 Choosing a File Format

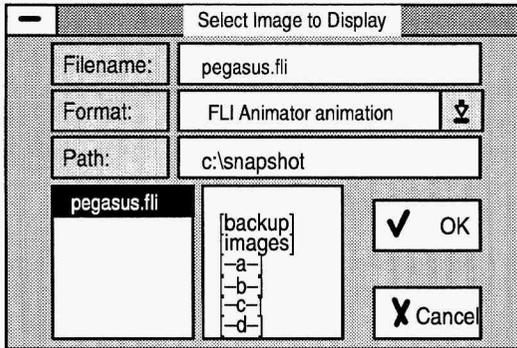
Click on this  icon and another dialog box, showing a stack of file formats, will appear.



To select one of these file formats click on the file format you wish to select; the video will reverse for a short instance and the selected file format will appear in the **Format** bar in reverse video. The sub-window will disappear. Notice that a filename (in this example: pegasus.fli) appears in the lower left, clear window.

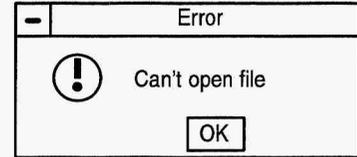


Click on this filename; the filename will reverse video and will appear in the **Filename** bar.



After the filename has been moved into the **Filename** bar, click on the **OK** icon to activate the file.

If for any reason a file can not be opened this message will appear; simply click on OK to get back.



Moving through the file format stack

You can use the scroll bar icon  to move through the file format stack. Put the arrow in this icon, hold the mouse button and move the bar icon up or down. As you move through the file format stack the previously selected file format will always stay in reverse video.

Note:

If you move the icon bar just a short distance nothing will happen – move it aggressively.

You can also move through the file format stack incrementally by clicking on the icons  once; or, if you wish, by holding the mouse button until the desired file format appears in the window. By keeping the mouse button depressed you can move to the beginning or to the end of the stack. Select the file format as described above.

4.4 Close

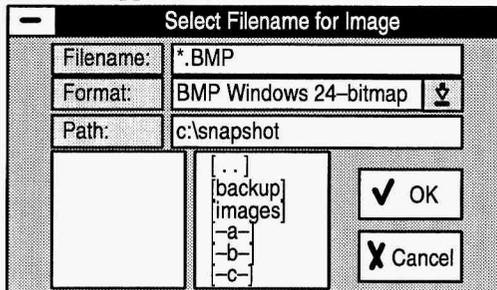
Closes the current window. If the current image, such as a frozen video frame image, had not been saved before, you will be asked if you would like to save it. Closing unused windows will help conserve memory.

4.5 Save

Saves the image of the active window with the same filename it had before it was opened. The current name will appear in the caption bar of the active window. To give an image a different name, use **Save As**.

4.6 Save As

Saves the image in the active window with a new name or under a different file format. After selecting **Save As**, this dialog box will appear:



Click on this  icon and choose the file format, followed by choosing a file name.

4.7 Grab Full Frame

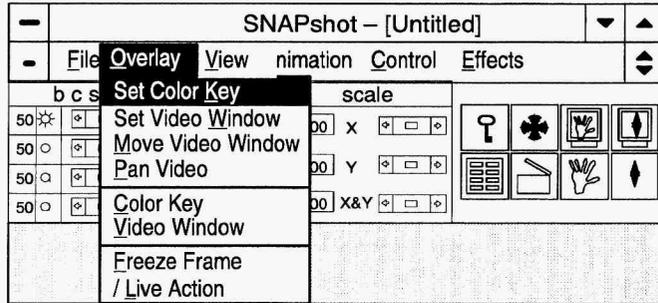
Grab Full Frame, or the hand  icon, is used to grab (capture) a video frame and save it as a file for later manipulation. Simply click on this icon, the frame will be captured (watch the fingers on the hand move) and a file save submenu will pop up.

4.8 Exit

Clicking on EXIT will Leave the SNAPshot program. You will be prompted to save any unsaved images as each of the windows is closed.

5. Overlay Menu

The Overlay menu contains functions for controlling the video and graphics overlay of the SNAPplus card. Color keying and video windows can be setup and turned on or off. The video can be frozen to a still image or shown as live motion.



5.1 Set Color Key

Select **Set Color Key** to set the color which will allow video to pass through that color. In other words it is possible to let video pass through an area of a certain color, i.e. all the white areas of a bird, all the green areas of a meadow or all the blue stars in a flag. If **Set Color Key** is active, clicking the mouse in the area (the blue stars in a flag) through which video is to be passed, will change the color key to the color of the pixel clicked on.

The **Color Key** will be made active automatically, but it can be turned on/off by clicking on it, or by using the **key** icon

on the Ribbon Control Panel; see section 5.5 for a detailed discussion.

5.2 Set Video Window

Select **Set Video Window** to open up a rectangular area for video display. If **Set Video Window** is made active, dragging the mouse in the client area will allow video to pass through in a rectangular region. Move the cursor to a point in the client window where the new video window is to start. Hold the mouse button and drag the cursor until the opening of the new window is the desired size and then let go of the button.

5

5.3 Move Video Window

Select **Move Video Window** to move the current video window to a different location while retaining the current size and contents. **Move Video Window** can be used only if a Video Window has previously been defined and is active in the current window. To move the video window, simply press the left button and drag the video window to its new location. The Move function stays in effect until either a Pan or a Set Color Key function is invoked.

5.4 Pan Video

Select **Pan Video** to move video around inside the video frame. Press the left mouse button and drag the picture around. The Pan function stays in effect until either a Move or a Set Color Key function is invoked.

5.5 Color Key

Select **Color Key** to activate or de-activate color keying. If **Color Key** is activated, a check mark will appear next to the **Color Key** menu item and video will pass through the currently selected color. **Color Key** can also be controlled via the SNAPshot Ribbon Panel by clicking on the key icon 

Color Key is effective only if **Set Color Key** has been turned on; see section 5.1.

Example:

The window you are displaying contains the picture of a yellow and red brick wall. The incoming video shows live video i. e. Star Wars. If you wish to have Star Wars pass through all the red bricks turn on **Set Color Key** and click on a red brick.

The **Color Key** has now been set to red and you will see that Star Wars will be passed through the bricks.

You can turn video passing on or off by clicking on the key icon  or by using the pull down window. If you wish to change to letting video pass through the yellow bricks, simply click on a yellow brick and Star Wars will be passed through.

5.6 Video Window

Select **Video Window** to activate or de-activate video windowing. If **Video Window** is activated, a check mark will appear next to the **Video Window** menu item and a video window will appear at the current rectangular coordinates. **Video Window** can also be controlled via the SNAPshot

Ribbon Panel by clicking on the window icon 

5.7 Freeze Frame

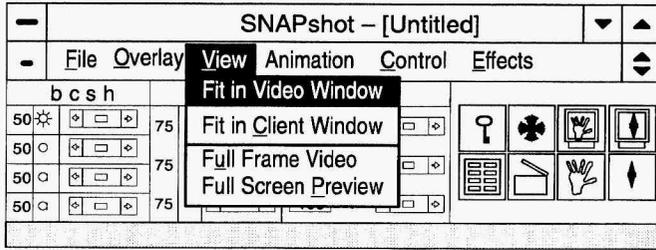
Select **Freeze Frame** to freeze the current video. If **Freeze Frame** is enabled, a check mark will appear next to the **Freeze Frame** menu item. If the input to the SNAPplus card is live motion video from a VCR or Camcorder, selecting **Freeze Frame** will freeze the video input in the current frame. Freeze Frame can also be selected from the SNAPshot Ribbon Panel by clicking on the snowflake icon: 

5.8 Live Action

Select **Live Action** to enable live motion video to the SNAPplus card. Typically, the card is in live action mode unless **Freeze Frame** has been enabled to grab a file. If **Live Action** is enabled, a check mark will appear next to the **Live Action** menu item. **Live Action** can also be selected from the SNAPshot Ribbon Panel by clicking on the slate icon: 

6. View Menu

The View menu contains functions for displaying the graphics or video image in various formats. The video can be scaled to a defined window, to the client window or it can be displayed full frame. The client window is defined as the available display area below the Ribbon Panel.



6.1 Fit In Video Window

Select **Fit In Video Window** to scale the video input to fit in the currently defined video window.

The video will be scaled so that the full frame video will fit into the video window. This may cause the aspect ratio to change and may not appear natural. **Fit In Video Window** can only be invoked if a video window has previously been defined and is active.

6.2 Fit In Client Window

Select **Fit In Client Window** to scale the video input to fit in the client window. The video will be scaled so that the full frame video will fit into the client area. **Fit In Client Window** can only be invoked if a video window has previously been defined and is active. **Fit In Client Window** can also be controlled via the SNAPSHOT Ribbon Panel by clicking on this  icon.

6.3 Full Frame Video

Select **Full Frame Video** to remove the Windows borders and display full frame video. Clicking on the left button of the mouse will return to the previous window state.

6.4 Full Screen Preview

Select **Full Screen Preview** to remove the Windows' borders and Snapshot Ribbon Panel and display the graphics or video of the current window. This option is useful for previewing before saving as a file or for taking the output of the SNAPSHOT to video tape. **Full Screen Preview** can also be controlled via the SNAPSHOT Ribbon Panel by clicking on this  icon.

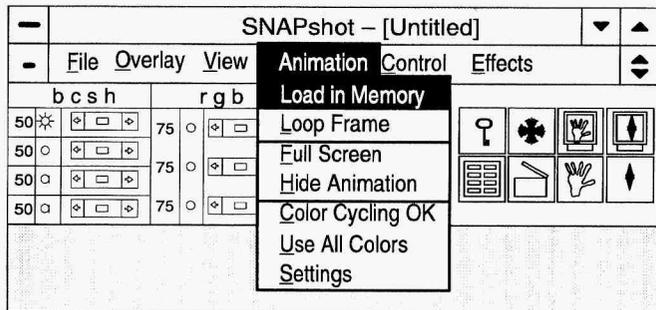
6

6

7. Animation Menu

With the Animation function the SNAPplus Desktop Video Adapter becomes a sophisticated interactive video graphics device. Animated entities, generated with Autodesk's Animator or Animator Pro™, can be superimposed over live video or still images. The movement of the animated entities can be controlled via the Animation Control Panel; see page 22. The degree of movement i. e. speed, duration, pause, etc. can be controlled by setting parameters in **Settings** as described on page 23.

All of the menu items except for **Settings** are toggles. Clicking on the item will activate it, displaying a check mark. Clicking again will de-activate it, removing the check mark.

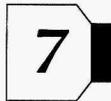
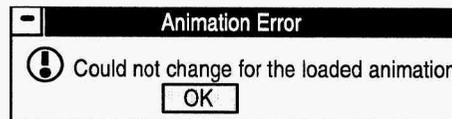


7.1 Load In Memory

From the **Animation** menu select **Load In Memory** to load the current and subsequent animations into memory for faster play back. When an animation is loaded into memory, access is faster than when the program must access a storage device such as a hard disk. This is especially true for animations with large average frame sizes. Normally, the animations are played from the hard drive; however, loading it into memory before playing it will cause a longer startup time. When playing back animations from the hard drive the transitions (fade from a certain color to black or fading from a certain color to white – at the start or at the end) may be very slow. If the transitions of a particular animation is too slow for your application then this animation is the one that should be loaded into memory. Always keep in mind that animations take up a lot of memory; make sure you have enough available memory.

Note: Before an animation file can be loaded into memory, **Load in Memory** has to be activated.

If the Animation Error window appears click on OK to get back.



7.2 Loop Frame

Select **Loop Frame** to make the last frame of the animation a transition between the last and first frames.

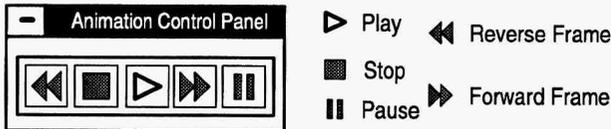
7.3 Full Screen

Select **Full Screen** to play the animation in a full screen VGA mode. The program hides other windows and centers the image on screen without Windows borders. In **Full Screen** mode, the animation will play faster and colors play back as designed. In addition the animation will become larger. When **Full Screen** is not active the animation is displayed in a window and the size of the animation does not change even if the animation window is maximized.

7

7.4 Hide Animation

Select **Hide Animation** to keep the animation invisible until it is played and hides it again when playback is stopped. Use the buttons on the **Animation Control Panel** to control the movement of the animation.



The **Animation Control Panel** will be displayed every time an animation file is loaded and can be removed by clicking

on the **Animation Control Panel** of the **Control** pull down window or by selecting **Close Alt + F4** from the sub-window shown above; click on this  icon.

7.5 Color Cycling OK

Turn **Color Cycling OK** on (selected) to reserve some of the Windows color palette for animation playback, this will result in faster playback. If **Color Cycling OK** is off (not selected), Windows will manage the color palette and will try to match the color for each frame to the rest of the screen. This will result in slow playback and some strange color effects.

7.6 Use All Colors

Use All Colors is effective only when **Color Cycling OK** is on and is irrelevant if **Full Screen** mode is used for playback.

When **Use All Colors** is off Windows palette entries are reserved only when animation color changes are detected; this speeds up animation.

When **Use All Colors** is on, 236 available Windows palettes entries are reserved. This gives animation complete control over all color changes, however, colors in other windows will be compromised.

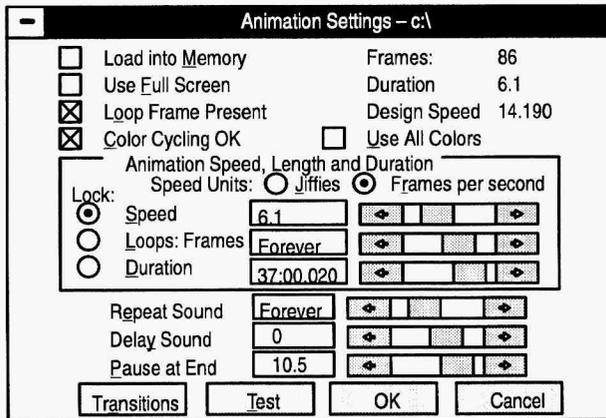
Suggestion:

Be judicious in the use of color in designing animations. If more than 256 are used playback will be less than perfect.

Plan your animations to change color sparingly, and plan palettes so they remain consistent within and between animations.

7.7 Settings

Select **Settings** for further control of animation playback. The **Settings** dialog pertains to parameter settings of the animation. Speed, number of loops, and duration of the animation when it is played back, can be set. These values can be changed either by typing in values or using the sliders and buttons.



7.7.1 Speed Units

Speed is expressed in either jiffies or frames per second; the default is frames per second. A jiffy is the shortest unit of pause between frames during playback. A single jiffy is approximately 1/70 second. Change from frames per second to jiffies by selecting one or the other.

7.7.2 Speed

When frames per second are used as speed units, the speed is increased by moving the slider to the right (the numbers increase); the frame speed may be limited to integral divisors of 18 frames per second (18, 9, 6 etc.) When Jiffies are used as speed units, the speed is increased by moving the slider to the left; the numbers decrease; see definition of a Jiffy in the previous section.

7.7.3 Lock

The Speed, Loops: Frames and Duration fields contain independent values; one must remain constant as the other two change. For example, if the speed of the animation is changed, either the number of loops or the duration must stay constant. This is the purpose of the **Lock** buttons. A field can be chosen to lock by clicking on it, or the slider bar of the locked field can be moved, in which case the lock automatically moves to another field.

7.7.4 Loop: Frames

Loops:Frames represent the number of times the animation is played. The first value, **Loops**, is the number of times to play a complete loop of the animation.

The second value, **Frames**, represents the number of frames played after all the frames have been played. The value in **Loop:Frames** can range from one frame to 999 loops. The value also can be set to **Forever** or to **Sound**. When the value is **Forever**, the animation will play until an external command stops it.

When the value is **Sound**, the animation loops until the associated sound finishes playing. The animation stops playing at whatever frame is on screen at the end of the sound.

7.7.5 Duration

7

This value represents the length of time the animation plays. Its value can range from 0 to 49:99:999 or Forever. When the value is Forever, the animation will play until an external command stops it.

7.7.6 Repeat Sound

Use this slider to change the number of repetitions of a sound during the selected animation. The slider range is 1 to 1,000, or Forever. (If a 0 is entered it will be interpreted as Forever.)

A value of Forever causes the sound to repeat for the duration of the animation's loop.

7.7.7 Delay Sound

With this slider one can specify when the sound should start in relation to when the animation starts. Its value can range from -50:00.000 to 50:00.000. A negative value causes the sound to start that specified amount of time before the animation, while a positive value starts the sound after the animation starts. A zero value, the default, starts the sound and animation simultaneously. The delay value is tied to the speed of the animation. If the design speed is not changed, the delay is as started. If the animation is slowed down or speeded up, the delay lengthens or shortens accordingly.

7.7.8 Pause at End

Use this slider to set the length of a pause at the end of the animation. Its value determines how long the last frame of an animation stays on screen and can range from 0.000 to 50.000 seconds.

7.7.9 Test

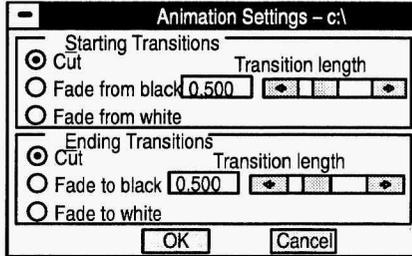
Click on this button to play through the animation with the settings as they are currently adjusted. Click again to return to **Settings** dialog box.

7.7.10 Cancel

Click on **Cancel** to exit from the **Settings** dialog box without having made any changes.

7.8 Transition Settings

Click on the **Transition** icon and this dialog box will appear:



A starting and an ending transition can be created by using the following options.

7.8.1 Cut

Click on **Cut** for no transition effect

7.8.2 Fade to Black

As a starting transition, this effect causes the animation to appear gradually from a black background. As an ending transition, the animation gradually disappears into a black background.

7.8.3 Fade to White

As a starting transition, this effect causes the animation to appear gradually from a white background. As an ending transition, the animation gradually disappears into a white background.

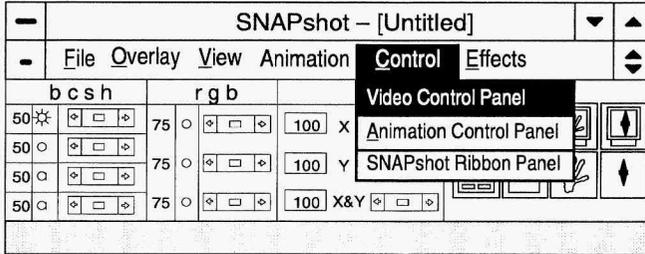
7.8.4 Transition Length

Each transition can be set to a length of between 0.25 and 10.0 seconds. Either enter a value in the field provided or adjust the slider. If **Cut** is selected the slider and transition field are disabled.



8. Control Menu

The Control pull down window contains a list of control menus that can be activated or deactivated. All of the menu items act as toggles. Clicking on the item will activate it, displaying a check mark. Clicking again will de-activate it, removing the check mark and the control panel.

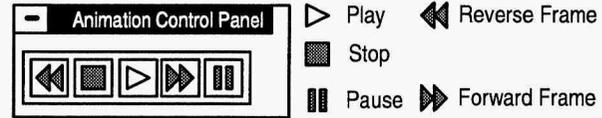


8.1 Video Control Panel

The Video Control Panel is not supported.

8.2 Animation Control Panel

Select **Animation Control Panel** to display or remove the animation control panel.



The **Animation Control Panel** will be displayed every time an animation file is loaded and can be removed by clicking on this menu selection or by selecting **Close Alt + F4** from the menu in the icon box.

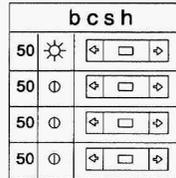
When the animation is initially loaded into the system the animation is motionless. The Animation Control Panel will be displayed only for animation purposes.

9. SNAPshot Ribbon Panel

Select the **SNAPshot Ribbon Panel** to activate or deactivate the ribbon panel. The **SNAPshot Ribbon panel** is automatically loaded at the start of the program and cannot be moved but can be removed. The **SNAPshot Ribbon Panel** contains the following controls:

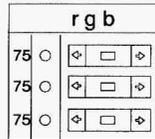
B C S H Control Faders

Vary percentage of Brightness, Contrast, Saturation and Hue in video from 0 to 100.



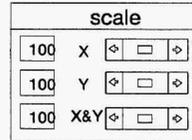
R G B Control Faders

Vary percentage of Red, Green and Blue in video from 0 to 100.



Scale Control Faders

Vary size of video from 0 to 1600 percent.



Color Key Button
Activate/Deactivate Color Keying.



Video Window Button
Activate/Deactivate Video Window.



Grab Button
Grab current image to file.



Freeze Frame Button
Freeze video to still image.



Live Action Button
Go to live motion video.



Full Screen Preview Button
Show full frame preview, no Windows border.



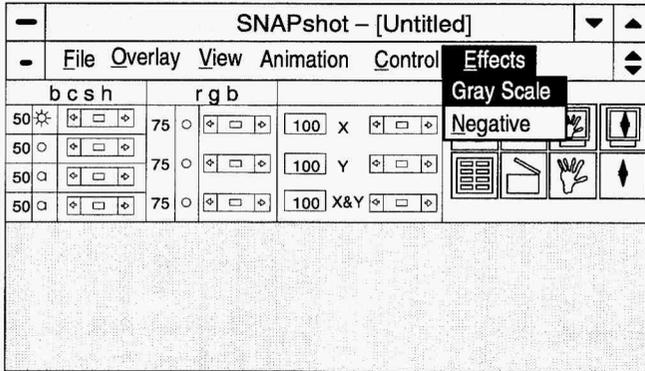
Fit In Client Window Button
Scale video to fit in client window



Grab Full Frame Button
Grab full image to file



10. Effects Menu



10.1 Gray Scale

Clicking on this button changes color video to gray scale; this is a toggle switch and when activated a check mark appears.

10.2 Negative

Clicking on this button changes the color video to a negative video; this is a toggle switch and when activated a check mark appears.

11. Drivers

None of the drivers, residing on the diskette, are required for standard VGA operation. However, using these drivers will maximize the performance and capabilities of the SNAPplus Desktop Video Adapter. You'll find two types of programs on the diskettes – **Utility Programs** and **Extended Mode Drivers** as well as a menu-driven **SETUP** program, which will help you load the utilities and drivers.

11.1 Extended Mode Drivers

The following drivers are available.

- Microsoft Windows 3.1
- Microsoft Windows 3.0
- OS/2 Presentation Manager V1.2
- AutoDesk AutoCAD release 10.0
- AutoDesk AutoCAD release 10.0/386 & 11.0/386
- Digital Research GEM V3.1
- Digital Research GEM V3.0
- Ventura Publisher V2.0
- Lotus 1–2–3 V2.0, 2.01/Symphony V 1.1
- Word Perfect V5.0
- Word Perfect V5.1
- VESA Drivers V1.00
- 8514/A Emulation

For application programs that contain run-time versions of Windows (e.g. Microsoft Excel, Aldus Pagemaker), simply install the appropriate Windows extended mode driver and the program will automatically operate in the desired extended mode. Installing other special drivers is not required.

11.2 Additional Driver Support

This card contains the popular Tseng Laboratories ET4000 VGA chip. Many software programs support this chip's extended modes. If your **SETUP** program lists a video configuration option for the **Tseng Laboratories ET4000** you should select it to enable your graphics adapter's extended modes.

Any software/driver which is compatible with the Cardinal Technologies 700 series VGAs will work on the SNAPplus Desktop Video Adapter.

11.3 The SETUP Program

SETUP is completely menu-driven and offers on-screen prompts to aid you in the installation.

The program is designed to help you:

- Review all the utility and driver programs included with your SNAPplus Desktop Video Adapter
- Load the desired programs onto your PC's hard drive

The following procedure explains how you can access and use the **SETUP** program to view the programs included with your SNAPplus Desktop Video Adapter and to load them onto your PC.

11.3.1 Using SETUP

The assumption is that drive a: will be used

1. Insert diskette #1 into drive a:
2. Type: **a:** **Press: Enter**
3. Type: **setup** **Press: Enter**
4. Press any key to display the main menu. The names of all the programs, residing in **SETUP**, will be listed.
5. To select a program on the list, use the **ARROW** keys to scroll up or down, and **Press: Enter**
6. A new window may appear, listing all available options. Sometimes only one option will be available. Use the **ARROW** keys to scroll through the list. **Press: Enter** to select one or more options.
7. When you have made a selection **Press: End**
8. You will probably want to install the programs in the same directory where you have installed other utility programs/drivers. For your convenience, you may want to specify this directory in the **PATH=** statement in your **autoexec.bat** file. See your **DOS** manual for more information.
9. Insert the path you wish to choose **Press: Enter** and follow instructions appearing on the screen.
10. After you have returned to the main menu **Press: Esc** to return to **DOS**.
11. Change to drive **C** by typing: **C:** **Press: Enter**
12. Change directory to the pathname created in step 9.
13. You can now call up the program/utility that you have installed – follow directions for the various installations.

12. Utility Programs

Available utility programs are: **VMODE.COM**, **VDIAG.EXE**, **CENTER.COM**, **FASTBIOS.SYS** and **EANSI.SYS**.

- VMODE.COM:** This utility is used to switch the display modes to best suit your requirements.
- VDIAG.EXE:** This utility is used to verify the functionality of the card.
- CENTER.COM:** This utility is used to center the screen.
- FASTBIOS.SYS:** This utility improves the card's performance by relocating the video BIOS in the computer's mother board RAM.
- EANSI.SYS:** This file enables your card to display 132 columns.

12.1 EANSI.SYS

The EANSI.SYS file enables you to utilize the enhanced modes of the SNAPplus Desktop Video Adapter. If your CONFIG.SYS file contains the line **DEVICE = ANSI.SYS** you need to replace that line with **DEVICE = EANSI.SYS** and copy the EANSI.SYS file to the root directory of your hard-disk. The following procedure explains how you can install the EANSI.SYS file to your hard-disk:

12.1.1 Installing EANSI.SYS

The assumption is that drive a: will be used

1. Insert diskette #1 into drive a:
2. Type: **a:**
3. Type: **setup**
4. Press any key to display the main menu. The names of all the programs, residing in SETUP, will pop up.
5. Select **Utility programs**
6. Select **EANSI.SYS**
7.
8. You now will get the message:
Enter the [drive:path] for installation.
[C:\]

Before copying selected drivers to your hard disk, the SETUP program will display the current drive and the directory where the drivers will be copied to. You can

change the drive and the directory by typing over these entries.

9. Insert the path you wish to choose **Press: Enter**
 You now will get the message: (if the drive path does not already exist)
Create path [C:\] (Y/N)?
10. Type: **Y** **Press: Enter** The installation will begin.
11. **Press: Esc**
12. After you have been returned to the main menu
Press: Esc to return to DOS.
 The system will prompt with:
Do you really want to exit (Y/N)?
13. Type: **Y** **Press: Enter**
14. Change to drive C by typing:
C: **Press: Enter**



You have to reboot before the EANSI.SYS file takes effect.



12.2 The FASTBIOS Accelerator Utility

Your SNAPplus Desktop Video Adapter contains a video graphics BIOS program which resides in EPROM (Electrically Programmable Read Only Memory.) This program enables the card to interface with your computer's operating system, as well as with graphics application software.

When installed, the BIOS Accelerator creates a TSR (Terminate and Stay Resident program), which loads a copy of the graphics BIOS into the computer's RAM (Random Access Memory), resulting in faster graphics performance.

NOTES:

The BIOS Accelerator uses approximately 3K of RAM and requires an 80286 or better computer.

If your computer shadows the Video BIOS ROM, you do not need to use this utility.

12.2.1 Installing the FASTBIOS

The assumption is that drive **a:** will be used

1. Slide diskette #1 into drive **a:**
2. Type: **a:** **Press: Enter**
3. Type: **setup** **Press: Enter**
4. Press any key to display the main menu. The names of all the programs, residing in SETUP, will pop up.

5. Select **Utility programs** (Press: **Enter**)

6. Select **FASTBIOS.SYS** (Press: **Enter**)

7. (Press: **End**)

8. You now will get the message:
Enter the [drive:path] for installation.
[C:\]

Before copying selected drivers to your hard disk, the **SETUP** program will display the current drive and the directory where the drivers will be copied to. You can change the drive and the directory by typing over these entries.

9. Insert the path you wish to choose (Press: **Enter**)

You now will get the message: (if the drive:path does not already exist)

Create path [C:\] (Y/N)?

10. Type: **Y** (Press: **Enter**) The installation will begin.

11. (Press: **Esc**)

12. After you have been returned to the main menu
(Press: **Esc**) to return to DOS.

The system will prompt with:
Do you really want to exit (Y/N)?

13. Type: **Y** (Press: **Enter**)

14. Change to drive C by typing:

C: (Press: **Enter**)

15. Add the following line to the **top** of your config.sys file:

DEVICE= <path>FASTBIOS.SYS

12.3 Screen Center Utility

The Screen Center Utility **CENTER.COM**, enables you to center the 800x600 and 1024x768 resolution display on your monitor. **CENTER.COM** automatically adjusts the screen whenever your computer gets re-booted. You do not need to re-run **CENTER.COM** unless you want to readjust the screen.

12.3.1 Installing the Screen Center Utility

The assumption is that drive a: will be used

1. Slide diskette #1 into drive **a:**

2. Type: **a:** (Press: **Enter**)

3. Type: **setup** (Press: **Enter**)

4. Press any key to display the main menu.
 5. Select **Utility Programs** (Press: **Enter**)
 6. Select **CENTER.COM** (Press: **Enter**)
 7. (Press: **End**)
 8. You now will get the message:
Enter the [drive:path] for installation.
[C:\]
- Before copying selected drivers to your hard disk, the SETUP program will display the current drive and the sub-directory where the drivers will be copied to. You can change the drive and the directory by typing over these entries.
9. Insert the path you wish to choose (Press: **Enter**)
 You now will get the message: (if the drive:path does not already exist)
Create path [C:\] (Y/N)?
 10. Type: **Y** – The installation will begin.
 11. (Press: **Esc**)

12. After you have been returned to the main menu
 (Press: **Esc**) to return to DOS.
 The system will prompt with:
Do you really want to exit (Y/N)?
13. Type: **Y**
14. Change to drive C by typing:
C: (Press: **Enter**)
15. Insert **<path> CENTER.COM** in the autoexec.bat file.
 <path> is the full path name of the directory, where CENTER.COM was copied to.
16. Reboot your computer.
17. Change to the directory where CENTER.COM was copied to and type:
CENTER (Press: **Enter**)
18. Follow instructions provided on the screen.

12.4 The Diagnostics Utility

This diagnostic program verifies the functionality of your SNAPplus Desktop Video Adapter card by showing specifications for each video mode and demonstrating each with color bars and text.

12.4.1 Installing the Diagnostics Utility

The assumption is that drive **a:** will be used

1. Slide diskette #1 into drive **a:**
2. Type: **a:** (Press: **Enter**)
3. Type: **setup** (Press: **Enter**)
4. Press any key to display the main menu. The names of all the programs, residing in SETUP will pop up.
5. Select **Utility Programs** (Press: **Enter**)
6. Select **VDIAG.EXE** (Press: **Enter**)
7. (Press: **End**)
8. Before copying selected drivers to your hard disk, the SETUP program will display the current drive and the sub-directory where the drivers will be copied to. You can change the drive and the directory by typing over these entries.
9. The installation will begin; follow instructions appearing on the screen.

10. After you have returned to the main menu

(Press: **Esc**) to return to DOS.

11. Change to drive C by typing:

C: (Press: **Enter**)

12. Insert **<path> VDIAG.EXE** in the autoexec.bat file. **<path>** is the full path name of the directory, where VDIAG.EXE was copied to.

13. Reboot your computer.

14. After the utility has been loaded, you can use it at any time by typing:

VDIAG (Press: **Enter**)

15. Follow instructions provided on the screen.



Caution



If you experience difficulty running the VDIAG at 800x600 resolution your monitor may not be compatible with the current refresh rate. You may need to adjust the refresh rate.

12.5 The Video Mode Selection Utility



Caution

You should use the Video Emulation Selection Utility program only if you have software that is written specifically for these emulation standards and the software cannot run in standard VGA mode.



The VMODE lets you set:

Video Emulation

Screen Format Selection

Refresh Rate Selection

Many graphics cards require that the monitor and the software match; i.e. a VGA card will run VGA software on a VGA monitor ONLY; an EGA card will run EGA software on an EGA monitor ONLY, etc. However, the SNAPplus Desktop Video Adapter will not only run VGA software, but also EGA, CGA, MGA or HGC software on your VGA monitor.

The SNAPplus Video Adapter can emulate (imitate):

- IBM Color Graphics Adapter (CGA)
- IBM Enhanced Graphics Adapter (EGA)
- IBM Monochrome Adapter (MGA)
- Hercules Monochrome Graphics Adapter (HGC)

Minimal software setup, if any, is required to emulate other devices. Some software packages automatically configure itself for the proper graphics mode. In that case, no further setup is required.

12.5.1 Installing the Video Mode Selection Utility

The assumption is that drive a: will be used

1. Slide diskette #1 into drive a:
2. Type: **a:**
3. Type: **setup**
4. Press any key to display the main menu. The names of all the programs, residing in SETUP will pop up.
5. Select **Utility Programs**
6. Select **VMODE.COM**
7.
8. You now will get the message:

Enter the [drive:path] for installation.
[C:\]

Before copying selected drivers to your hard disk, the SETUP program will display the current drive and the

sub-directory where the drivers will be copied to. You can change the drive and the directory by typing over these entries.

9. Insert the path you wish to choose (Press: **Enter**)

You now will get the message: (if the drive:path does not already exist)

Create path [C:\] (Y/N)?

10. Type: **Y** – The installation will begin.

11. (Press: **Esc**)

12. After you have been returned to the main menu

(Press: **Esc**) to return to DOS.

The system will prompt with:

Do you really want to exit (Y/N)?

13. Type: **Y**

14. Change to drive C by typing:

C: (Press: **Enter**)

15. Insert **<path> VMODE.COM** in the autoexec.bat file.
<path> is the full path name of the directory, where VMODE.COM was copied to.

By placing the VMODE command in your autoexec.bat file, your computer will automatically configure the VGA card to the desired mode of operation upon power-up.

12.5.2 Running VMODE

When you access VMODE for the **first time** you have to run **VMODE INSTALL**.

Type: **vmode <parameter>** and you will get this message:
Please run VMODE INSTALL first to configure the program

Type: **VMODE install** – make your choice and follow instructions.

You can now use VMODE any time by typing:

VMODE <parameter> (Press: **Enter**)

where <parameter> corresponds to the desired emulation, as shown in this chart.

Parameters		
cga	vga	mono
ega	mga	color
	hercules	

Follow instructions provided on the screen.



Caution



Once you have locked the
SNAPplus Desktop Video

Adapter into **mga**, **cga**, or **ega** emulation, **DO NOT** attempt to run VGA software, and **DO NOT** attempt to use any of the other graphics utilities or drivers described in this manual.

12.5.3 Refresh Rate Selection

In order to take advantage of the enhanced capability of high performance monitors, this SNAPplus Desktop Video Adapter provides enhanced modes of operation beyond the VGA standard. Table 1 and Table 2 summarize the operating modes.

Before using VMODE to select a new refresh rate, you would need to verify that your monitor is capable of supporting the horizontal and vertical frequencies listed in the table for the desired video modes. If your monitor can not support these frequencies the display will be distorted.

All mode numbers are in hexadecimal format. Several modes, such as 29, 30 and 38 can be operated at different refresh rates. You can select the rate best suited for your application by typing:

VMODE <VMODE argument>

VMODE <mode number>

Mode number and VMODE argument are listed in Table 1, Table 2 and Table 3.

Example 1:

To run a text editor at 640x480 resolution, with 16 colors and 80x30 text format (mode 12) at 72 Hz, enter:

VMODE 72h

VMODE 12

then invoke the Editor.

Example 2:

If you have already selected 800x600x256 driver for Windows and now wish to run Windows at 72Hz, enter:

VMODE 48k

then invoke Windows.

If you are experiencing problems running in the 800x600 mode it may be necessary to adjust the horizontal refresh rate of the SNAPplus Desktop Video Adapter to meet the requirements of your monitor. Please review the refresh rates shown in Table 1 and Table 2 to determine proper operating frequencies.

NOTE:

If your monitor screen becomes unstable after a VMODE command, you can restore it to the power-up configuration by typing:

VMODE 80x25 or VMODE VGA

Mode	Vmode Argument	Type	Colors	Text	Font	Pixels	H. Freq. Khz	V. Freq. Hz
0	200	Text	16	40x25	8x8	320x200	31.50	70.00
0 ⁺	350	Text	16	40x25	8x14	320x350	31.50	70.00
0 ⁺	400	Text	16	40x25	9x16	360x400	31.00	70.00
1	200	Text	16	40x25	8x8	320x200	31.50	70.00
1 ⁺	350	Te-xt	16	40x25	8x14	320x350	31.50	70.00
1 ⁺	400	Text	16	40x25	9x16	360x400	31.50	70.00
2	200	Text	16	80x25	8x8	640x200	31.50	70.00
2 ⁺	350	Text	16	80x25	8x14	640x350	31.50	70.00
2 ⁺	400	Text	16	80x25	9x16	720x400	31.50	70.00
3	200	Text	16	80x25	8x8	640x200	31.50	70.00
3 ⁺	350	Text	16	80x25	8x14	640x350	31.50	70.00
3 ⁺	400	Text	16	80x25	9x16	720x400	31.50	70.00
4		Graphics	4	40x25	8x8	320x200	31.50	70.00
5		Graphics	4	40x25	8x8	320x200	31.50	70.00
6		Graphics	2	80x25	8x8	640x200	31.50	70.00
7	350	Text	Mono	80x25	9x14	720x350	31.50	70.00
7 ⁺	400	Text	Mono	80x25	9x16	720x400	31.50	70.00
D		Graphics	16	40x25	8x8	320x200	31.50	70.00
E		Graphics	16	80x25	8x8	640x200	31.50	70.00
F		Graphics	Mono	80x25	8x14	640x350	31.50	70.00
10		Graphics	16	80x25	8x14	640x350	31.50	70.00
11		Graphics	2	80x30	8x16	640x480	31.50	60.00
11	72h	Graphics	2	80x30	8x16	640x480	39.00	73.00
12		Graphics	16	80x30	8x16	640x480	31.50	60.00
12	72h	Graphics	16	80x30	8x16	640x480	39.00	73.00
13		Graphics	256	40x25	8x8	320x200	31.50	70.00

Table 1 Standard Operating Modes

Mode	Vmode Argument	Type	Colors	Text	Font	Pixels	H. Freq. Khz	V. Freq. Hz
21		Text	16	132x60	8x8	1056x480	30.50	60.00
22		Text	16	132x44	8x9	1056x396	30.50	70.00
23		Text	16	132x25	8x16	1056x400	30.50	70.00
24		Text	16	132x28	8x14	1056x392	30.50	70.00
25		Graphics	16	80x60	8x8	640x480	31.50	60.00
25	72h	Graphics	16	80x60	8x8	640x480	39.00	73.00
26		Text	16	80x60	8x8	720x480	31.50	60.00
29	35k	Graphics	16	100x37	8x16	800x600	35.50	56.00
29	38k	Graphics	16	100x37	8x16	800x600	38.00	60.00
29	48k	Graphics	16	100x37	8x16	800x600	48.00	73.00
2A	35k	Text	16	100x40	8x15	800x600	35.50	56.00
2A	38k	Text	16	100x40	8x15	800x600	38.00	60.00
2D		Graphics	25	680x25	8x14	640x350	31.50	70.00
2E		Graphics	25	680x30	8x16	640x480	31.50	60.00
2E	72h	Graphics	25	680x30	8x16	640x480	39.00	73.00
2F		Graphics	25	680x25	8x16	640x400	31.50	70.00
30	35k	Graphics	256	100x37	8x16	800x600	35.50	56.00
30	38k	Graphics	256	100x37	8x16	800x600	38.00	60.00
30	48k	Graphics	256	100x37	8x16	800x600	48.00	73.00
37 _i	45m	Graphics	16	128x48	8x16	1024x768	35.50	87.00
37	65m	Graphics	16	128x48	8x16	1024x768	49.00	60.50
37	72m	Graphics	16	128x48	8x16	1024x768	56.00	70.00
38	45m	Graphics	256	128x48	8x16	1024x768	35.50	87.00
38	65m	Graphics	256	128x48	8x16	1024x768	49.00	60.50
38	72m	Graphics	256	128x48	8x16	1024x768	56.00	70.00
3D _i		Graphics	16	160x64	8x16	1280x1024	48.00	87.00

Table 2 Enhanced Operating Modes

Mode	Vmode Argument	Type	Colors	Text	Font	Pixels	H. Frequ. Khz	V. Frequ. Hz
2D		Graphics	65	80x25	8x14	640x350	31.50	70.00
2E		Graphics	65	80x30	8x16	640x480	31.50	60.00
2E	72h	Graphics	65	80x30	8x16	640x480	39.00	73.00
2F		Graphics	65	80x25	8x16	640x400	31.50	70.00
30	35k	Graphics	65	100x37	8x16	800x600	35.50	56.00
30	38k	Graphics	65	100x37	8x16	800x600	38.00	60.00

Table 3 High Color Operating Modes

12.6 Text Mode Selection

Your SNAPplus Desktop Video Adapter can display 132 columns and up to 60 lines (rows) of text when using popular text-based applications on high performance VGA and multi synchronous monitors.

NOTE:

When using this utility with an application program such as WordStar or WordPerfect, the application may have to be configured for the specific screen size. Please refer to the appropriate section in this manual for information on how to configure these programs.

After the VMODE utility has been loaded you can access it any time by simply typing:

vmode <columns x rows> Press: Enter

Valid values for columns x rows are:

40 x 25	80 x 25	80 x 43	80 x 50	80 x 60
100 x 40	132 x 25	132 x 28	132 x 44	132 x 60

If, for example, you wanted to set 132 columns with 25 rows for your text screen, you would specify the following command:

vmode 132x25 Press: Enter

Be aware that your monitor's display capabilities may limit the number of columns/rows you can display.

13. The Enhanced Mode Drivers

	Caution	
<p>Installing these software drivers requires reasonable proficiency with the DOS operating system and the appropriate software package. Incorrect installation can render the application software inoperable.</p>		

Your graphics card is 100% IBM VGA compatible and provides all standard operating modes and resolutions. Plus, it offers a large set of enhanced functions and higher resolutions.

The enhanced mode drivers software enables your card to use enhanced operating modes. These modes are shown in Table 1 and Table 2, starting on page 43.

If you intend to use your graphics card in the standard VGA modes ONLY, you do not need to install the enhanced mode drivers programs.

NOTE:

We recommend that you install your graphics software and verify that it operates properly in the standard VGA modes *before* installing any of the enhanced mode drivers software.

13.1 Monitor Compatibility

Before installing any enhanced mode driver program, you need to ensure monitor compatibility. Verify that your monitor supports the enhanced resolution(s) you want to use – consult the appropriate user’s documentation or contact your dealer. Make sure that your monitor is capable of handling the refresh rate (horizontal and vertical frequency), listed in Table 1, Table 2 and Table 3. Following are some general compatibility guidelines:

- Standard VGA monitors do not support 800x600 and 1024x768 resolutions.
- Most multi-synchronous monitors, such as the NEC Multisync II and Sony CPD-1303, will support up to 800x600 resolution.
- High performance multi-synchronous monitors, such as the NEC 3D, will support up to 1024x768 resolution (interlaced.)
- Super high performance multi-synchronous monitors, such as the NEC 4D and Sony Multiscan CPD-1304, will support all modes up to 1024x768 resolution (non-interlaced.) The NEC 5D can support up to 1280x1024 resolution.

Each new release of the supported application packages (i.e. Windows, AutoCAD etc.) usually requires a new release of the corresponding enhanced mode drivers program. The program releases which are supported are clearly indicated in the SETUP program's main menu.

13.2 The VESA High Resolution Drivers

VESA (Video Electronics Standards Association) drivers provide an industry standard software interface to the extended resolutions and features of the graphics hardware. These drivers work with any of a large number of software programs which adhere to the VESA graphics standard, thereby eliminating the need for drivers that are unique to each particular software package.

The VESA drivers conform to the VESA Super VGA Standard #VS891001. The drivers support the following extended modes:

800x600	16 colors	graphics
1024x768	16 colors	graphics
1280x1024	16 colors	graphics
640x480	256 colors	graphics
1024x768	265 colors	graphics

13.2.1 Installing the VESA Drivers

- Slide Diskette #1 into drive a:.
- Type: **setup**
- Press any key to continue.
- Select **VESA High Resolution Drivers**
 and
- Before copying selected drivers to your hard-disk, the SETUP program will display the current drive and the sub-directory where the drivers will be copied to.
- Insert the path you wish to choose
You now will get the message: (if the drive:path does not already exist)

Create path [C:\] (Y/N)?

- Type: **Y** (The installation will now begin.)
- Follow instructions appearing on the screen.

You can access the driver at any time by changing to the directory you had created and type:

VESA VGA

Note: You will probably want to install these drivers in the same directory where you have installed other drivers. For your convenience, you may want to specify this directory pathname in the PATH=statement in your AUTOEXEC.BAT file.

13.3 The 8514/A Drivers

The 8514/A drivers provide an industry standard software interface to the enhanced resolutions provided in many of today's graphics hardware devices, including the SNAPplus Desktop Video Adapter. These drivers work with any of a large number of software programs, which adhere to the 8514/A graphics software standard, thereby eliminating the need for drivers that are unique to each particular software package. The 8514/A drivers support the following enhanced modes:

Note: There are a few software packages which directly access 8514/A hardware registers instead of working through the 8514/A software interface (Microsoft Windows is one of these notable exceptions.) These packages will not work with this set of drivers.

13.3.1 Installing the 8514/A Drivers

1. Slide Diskette #1 into drive a:

2. Type: **a:** **Press: Enter**

3. Type: **setup** **Press: Enter**

4. Press any key to continue. The SETUP main menu will display the names of all the utility and driver programs.

5. Select **8514/A Emulation** **Press: Enter**

6. Select the desired resolution **Press: Enter**

7. **Press: End**

8. Follow instructions appearing on the screen.

Note:

You will probably want to install the driver in the same directory where you have installed other utility software. By placing the pathname in your system's AUTOEXEC.BAT file, your computer will automatically install the driver for you.

9. Change to the directory where you installed the driver, then type:

[RIXAI4] if you plan to use the 16-color drivers, or:

[RIXAI8] if you plan to use the 256-color drivers.

10. Start your application software. You may need to re-configure your program to run with the new 8514/A driver. See your software user's manual for more information.

14. The Lotus 1–2–3 Drivers

The Lotus drivers are designed to work with Lotus 1–2–3, release 2.0/2.01. These drivers are also designed to work with Lotus Symphony, release 1.0/1.1/2.0. If you are not familiar with the Lotus INSTALL program, read the *Getting Started* section of the Lotus documentation.

If the Lotus package has not yet been installed, install it according to the Lotus manual and verify that it operates properly.

The Lotus drivers support the following resolutions:

80x25	16 colors	text
80x60	16 colors	text
132x25	16 colors	text
132x28	16 colors	text
132x44	16 colors	text

14.1 Installing the Lotus Drivers

1. Slide Diskette #1 into drive a:
2. Type: **a:**

3. Type: **setup**
4. Press any key to continue.
The SETUP main menu will display the names of the utility and driver programs.
5. Select **Lotus**
6. Select the desired resolution (see table above)
7.
8. Before copying selected drivers to your hard-disk, the SETUP program will display the current drive and the sub-directory where the drivers will be copied to. You can change the drive and the directory by typing over the displayed one.
9. Insert the path you wish to choose
10. You now will get the message: (if the drive:path does not already exist)

Create path [C:\] (Y/N)?

11. Type: **Y** Press: **Enter**
The installation will now begin; follow instructions.
12. Press: **Esc** to return to DOS.
13. After you have been returned to DOS, change directory to where you had installed Lotus and start the installation program by typing:
install Press: **Enter**
The Lotus 1–2–3 install menu should appear.
14. Follow instructions provided.
When the Main Menu appears:
15. Select **Advanced Options**
16. Select **Add New Drivers to Library.**
17. Select **Modify Current Driver Set.**
18. Select **Text Display or Graphic Display**
19. Select one of the following enhanced text modes (corresponding to the driver you installed):
VGA Adapter (80x25 color text only)
VGA Adapter (80x60 color text only)
VGA Adapter (132x25 color text only)

VGA Adapter (132x28 color text only)

VGA Adapter (132x44 color text only)

VGA Adapter (All Color Text Modes)

20. Select **Return to Menu.**
21. Select **Save Changes.**
22. Specify the name of the driver set. The default name of the Lotus driver set is **123**. If desired, Press: **Enter** to select this name; otherwise specify another name.
NOTE:
If you choose the default driver set name, the enhanced text mode is automatically selected when Lotus is started. If you enter your own driver set name, you will need to type:
123 <driver set name> Press: **Enter**
to run Lotus with the enhanced text mode. While this method may be less convenient, it does allow Lotus to be run in the standard 80 column mode when it is started with the **123<driver set name>** command.
23. Exit the program.
Additional driver sets can be created at any time by repeating this procedure. However, if more than one set is generated, each set requires a unique name.

15. The Microsoft Windows Drivers

15.1 Windows 3.1 Drivers

The Windows 3.1 driver installation is done **entirely** via Windows SETUP. These driver files are in Microsoft compressed format and can only be accessed and executed by installing through Windows SETUP. Copying the files into the \Windows\System sub-directory **will not** work and may corrupt the Windows installation.

15.1.1 Installing the Windows 3.1 Drivers

If Microsoft Windows 3.1 has not yet been installed, install it now and verify that it operates properly.

1. Make a sub-directory to hold the driver files, type:

md let4drv (Press: **Enter**)

2. Insert the Windows 3.1 driver diskette into the appropriate drive and type:

copy a:*. * let4drv (Press: **Enter**)

3. Move to the Windows sub-directory and type:

setup (Press: **Enter**)

Or, with Windows running, select **Setup** from the Program Manager Main group.

4. Select: **DISPLAY** from the Menu
5. Select: **OTHER. . .** from the Menu
6. When asked where the graphics drivers will be found, type the following (delete what the system has displayed in the input window):
let4drv
7. Select the appropriate driver/resolution from the list.
8. Proceed normally through the remainder of the installation procedure. You are now ready to use the installed drivers with your Windows 3.1 application.

15

15.2 The Microsoft Windows 3.0 Drivers

The drivers support the following resolutions:

800x600	16 colors
1024x768	16 colors
1280x1024	16 colors
640x480	256 colors
800x600	256 colors
1024x768	256 colors
640x480	32k colors
800x600	32k colors
640x480	65k colors
800x600	65k colors

15.2.1 Installing the Windows 3.0 Drivers

If Microsoft Windows 3.0 has not yet been installed, install it and verify that it operates properly.

1. Slide diskette #1 into drive a:
2. Type: **a** (Press: **Enter**)

3. Type: **setup** (Press: **Enter**)
4. Press any key to continue.
The SETUP main menu will display the names of all the utility and driver programs.
5. Select **Microsoft Windows 3.0** (Press: **Enter**)
6. Select the desired resolution (Press: **Enter**)
7. (Press: **End**)
8. Before copying selected drivers to your hard-disk, the SETUP program will display the current drive and the sub-directory where the drivers will be copied to. You can change the drive and the directory by typing over the displayed one.
9. Insert the path you wish to choose (Press: **Enter**)
10. Follow the instructions provided.
11. Return to DOS, change directory to where you had installed Windows and run the Microsoft Windows SETUP program.

16. The AutoCAD 10.0 Drivers

These drivers provide AutoDesk's AutoCAD program (release 9.0 and 10.0) with the following resolutions:

640x480	16 colors	graphics
800x600	16 colors	graphics
1024x768	16 colors	graphics

NOTE:

This AutoCAD driver conforms to the AutoDesk Device Interface (ADI) for rendering drivers and display drivers.

16.1 Installing the AutoCAD 10.0 Driver

1. Slide diskette #1 into drive a:.
2. Type: **a:** (Press: **Enter**)
3. Type: **setup** (Press: **Enter**)
4. Press any key to continue.
The SETUP main menu will display the names of all the utility and driver programs.
5. Select **AutoDesk AutoCad release 9.0 or 10.0**

6. Select the desired driver(s) and follow the instructions appearing in the bar at the bottom of the screen.
7. After the installation is completed (Press: **Esc**)
8. From the main menu (Press: **Esc**) to return to DOS.
9. Move to the AutoDesk AutoCad directory.
10. Configure the driver for the desired resolution and screen colors.
Type: **VINST** and respond to the questions.

Color codes are as follows:

0 - Black	4 - Cyan
1 - Red	5 - Blue
2 - Yellow	6 - Magenta
3 - Green	7 - White
8-15 - Intensified versions of 0-7	

11. Install the driver in your AutoCAD program by typing: **VADI40** (Press: **Enter**)
12. Configure your AutoCAD program for the new driver by following these remaining steps.

13. Start AutoCAD by typing:
ACAD (Press: **Enter**) and select
Configure AutoCAD from the AutoCAD main menu.
14. Select **Configure Video Display** from the configuration menu.
15. Select **ADI display** from the list of video drivers (installed at interrupt 7A.)
16. Continue through the configuration process, save the new configuration and return to the main menu.

NOTE:

The AutoCAD driver can be re-configured at any time for different resolutions by running the VINST program again (as described in step 8.)

16

16.2 Installing AutoShade

The first time you use AutoShade with an ADI driver, you need to configure AutoShade for an ADI display. Follow these steps.

1. Change to the directory where AutoShade is installed.

2. Before running the AutoShade program, delete the file **SHADE.CFG**.
3. Start the AutoShade program.
The program will ask for a display and rendering driver. Select **ADI** for both drivers and indicate that you have a **Dual Display System**.
4. When you exit the AutoShade program, a new **SHADE.CFG** file will be created for you.

16.3 Using the AutoCad 9.0/10.0 Driver

The new driver must be loaded each time you start your computer. Follow these instructions.

1. Load the driver by typing:
VADI40 (Press: **Enter**)
2. Start AutoCAD by typing:
ACAD (Press: **Enter**)

NOTE:

By placing your command from step 1 in your AUTOEXEC.BAT file, your computer will automatically install the driver for you.

17. The AutoCad DLD-386 Driver

The DLD386 driver is compatible with AutoCad Release 10/386 and 11/386. It runs in the protected mode only.

17.1 Features

- Accelerates redraws, pans, zooms
- Transparent to use – no new commands or special menus are required
- Protected mode ADI driver – completely AutoCad 386, Release 11, 3D Studio and AutoShade 2.0 w/RenderMan compatible
- No memory conflicts; works with AutoCad 386's built-in Virtual Memory Manager
- Supports both 16 and 256 color VGA modes. For rendering, the 24 bit True Color is also supported.
- Includes *Custom Colors*, which lets you customize all logical and physical colors in an interactive mode.
- Completely compatible with all AutoCad 3rd party software
- Supports higher resolutions, up to 1024x768, with 256 colors

17.2 System Requirements

A 386 or 486 PC with AutoCad 386, Release 10/386 and 11/386, 3D Studio, or AutoShade 2.0 w/RenderMan

Additional extended memory is recommended for optimal performance. If there is significant hard-disk activity while you are using DLD386-VGA, it may be an indication that you should add more memory to your system. One MB of memory is recommended for the driver.

17.3 Configuring DLD-386 VGA

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

If you need to make some change to an existing configuration, running DLDSETUP again will allow you to reconfigure DLD386-VGA with all the prompts defaulting to the values you had selected during your previous configuration. If you want to start with a completely fresh installation, just delete **DLDSETUP.DAT** in the directory pointed to by the **DLDCFG** environment variable.

Also, if at any point during the configuration process you want to change an item on a previous menu, just press the **ESC** key until you have returned to the desired menu. Pressing **ESC** at the Driver Selection prompt will return you to DOS without making any changes to your configuration.

17.4 Installing the DLD-386 Drivers

1. Slide diskette #1 into drive a:
2. Type: **a:**
3. Type: **setup**
4. Press any key to continue.
The **SETUP** main menu will display the names of all the utility and driver programs.
5. Select **AutoDesk AutoCad rel. 10/386 or 11/386**

6. Select the desired driver(s) by following the instructions appearing in the bar at the bottom of the screen

7.

8. You now will get the message:

Before copying selected drivers to your hard-disk, the **SETUP** program will display the current drive and the sub-directory where the drivers will be copied to. You

can change the drive and the directory by typing over the displayed one.

9. Insert the path you wish to choose
10. You now will get the message: (if the drive:path does not already exist)

11. Type: **Y**

The installation will now begin.

12.

13. After you have been returned to the main menu

to return to DOS.

The system will prompt with:

14. Type: **Y**

15. After you have been returned to DOS, move to the directory that you installed **DLD386-VGA** and type:

DLDSETUP to start the configuration

program.

An information screen, informing what **DLDSETUP** does, will appear. Press any key to continue once you have read the overview.

16. You will now be prompted for the type of DLD386–VGA driver you wish to use: **16 Color** or **256 Color**. The 16 Color driver (DLDVGA.EXP) supports AutoCAD and the AutoShade and 3D Studio design screens in 16 colors at any 16 color resolution supported by your VGA board. The 256 Color driver (DLDVG256.EXP) supports AutoCAD in your VGA board’s 256 color modes. While you have many more colors to choose from in AutoCAD in the 256 Color mode, drawing will be somewhat slower because the driver has to manipulate more bytes of information on the display. In both cases, the rendering portions of 3D Studio and AutoShade 2.0 w/RenderMan will be supported at 65k colors.

17. To progress to the next menu, the *Driver Configuration Menus*, you must hit <F10> or Press: **Enter**

18. The Single vs Dual Screen option is used to tell the driver if you want to operate on only one screen (the one attached to the VGA board) or two (in case you also have a Monochrome Display Adapter in the same system as the VGA) when in AutoCAD. If you choose **Automatic**, the driver will run single screen if AutoCAD is started on the VGA, and dual screen if you start AutoCAD from the monochrome display. Selecting **Always Dual** will cause the driver to always run in dual screen mode – don’t se-

lect this mode if you don’t have a monochrome board in your system.

19. The Flip Screen Method is a fail–safe feature. In virtually all cases the **Instant** selection will suffice, but in some rare cases the combination of a certain VGA with a system may result in junk on the display when doing a flip screen back to the graphics display in AutoCAD. If this occurs on your system, use the **Force Redraw** option to eliminate this junk. The forced redraw will occur at normal AutoCAD speed, not DLD386–VGA redraw speed. Please note that this prompt does not appear when you have selected the 256 Color VGA driver, since you are always running in the Force Redraw mode when you are in the 256 color modes

20. You may choose the **Font** size you would like to use for your AutoCAD menus, pull–downs, and dialog boxes; i.e. **8x8/8x14/8x16**. All the fonts are 8 pixels wide, but the height varies. For resolutions above 800x600 we recommend the 8x16 font selection. The default is the 8x14 font.

21. Enter the method for updating the Display List: **Remove/Overwrite/Disable**. For a trouble–free operation, we suggest that you choose **Overwrite** initially.

When an object is erased or moved, the **Remove** option causes its vectors to be removed from the Display List. The **Overwrite** option causes new **erase** vectors to be

added to the Display List so the object will be drawn, then rubbed out on screen updates. This option avoids the potentially major list update delay associated with the **Remove** option, but increases redraw time and makes the Display List larger (you can clean up the display list with the **DLDCLEAN** command – see: *Advanced Features* for more information.) **Disable**, disables the Display List – the Fast Redraw List is still maintained, unless you specifically disable it as well. See – *The Remove/Overwrite Option*, for complete information.

22. Enter the method for updating the Fast Redraw List: **Remove/Overwrite/Disable**. For trouble-free operation, we suggest that you choose **Overwrite** initially.

When an object is erased or moved, the **Remove** option causes its vectors to be removed from the Fast Redraw List. The **Overwrite** option causes new **erase** vectors to be added to the Fast Redraw List so the object will be drawn, then rubbed out on screen redraws. This option avoids the potentially major list update delay associated with the **Remove** option, but increases redraw time and makes the Fast Redraw List larger. **Disable**, disables the Fast Redraw List, slowing redraws to pan/zoom speed.

23. Your SNAPplus Desktop Video Adapter can display up to 65k colors. Answer **Yes** if you plan to use the AutoDesk rendering package.

24. Enter the number of lines of text you would like to appear at the bottom of your AutoCAD screen. You may select a number between 1 and 10. If you do not want any lines of text at the bottom of the display, use AutoCAD to disable the command area (see your *AutoCAD Installation manual* for more information). The default for this prompt is 3.

25. Choose **Cardinal Video Color 24** from the list which appears when you press <F1>. You may need to page up or down to find your card. Once you have made a board selection, you will have to select the resolution that you want to run AutoCAD and AutoShade at. Press the <F10> key once you have made your choice.

26. Once all changes are made, press the <F10> key to save the configuration information. The batch file **FASTA-CAD.BAT** will be created in the current directory, and the configuration file **DLDCFG.DAT** will be created in either the directory pointed to by the **DLDCFG** environment variable or, if **DLDCFG** is not set, in the current directory.

27. Configure your colors by running **COLOR16.EXE** if you are using the 16 color VGA modes, or **COLOR256.EXE** if you are using the 256 color VGA modes. See *Changing Colors* for more information on configuring your AutoCAD colors.

28. Copy the newly created **FASTACAD.BAT** to your boot drive root directory, your AutoCAD directory, or into any directory on your DOS path. Then, whenever you want to load **DLD386-VGA**, just run the **FASTACAD.BAT** file.

The **FASTACAD.BAT** file contains four lines that set four separate environment variables:

DLDCFG, used by PanaRender-VGA+, to find all of its configuration files; and

DSPADI, **RCPADI**, **RPADI** – used by AutoCAD, AutoShade 2.0 w/RenderMan, and 3D Studio to find the driver file. **FASTACAD.BAT** only needs to be run once per system boot.

NOTE:

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

The actual configuration information for **DLD386-VGA** is located in the file **DLDSETUP.DAT**, which was created or modified when you last ran **DLDSETUP**.

29. If you want the environment variables to be set automatically at startup, edit your **AUTOEXEC.BAT** file and add a line to run **FASTACAD** to the end of it; i.e., **FASTACAD**. This assumes that the directory in which **FASTACAD.BAT** resides is in your **PATH**. If you have DOS 3.2 or earlier, the command needs to be at the end of your batch file because DOS can't return to the **AUTOEXEC.BAT** file after running the **FASTACAD** batch file. If you have DOS 3.3 or subsequent versions of DOS, use the command **CALL FASTACAD** instead, anywhere in the **AUTOEXEC.BAT** file. Alternately, you may want to just copy the contents of the **FASTACAD.BAT** file into your **AUTOEXEC.BAT** file. If you don't wish to put the command(s) in your **AUTOEXEC.BAT** file, you may put them in a batch file which also starts AutoCAD, or simply remember to run **FASTACAD** before starting AutoCAD.

NOTE:

If you get a message such as **Out of Environment Space** when you run **FASTACAD.BAT**, you will need to enlarge your environment. If you are running MS-DOS 3.2 or later, this is accomplished by adding:

SHELL=C:\COMMAND.COM /P C:\E:768

to your **CONFIG.SYS** file. The **/E:768** specifies an environment size of 768 bytes. Change this number as ap-

propriate. You will need to reboot if you modify your **CONFIG.SYS** file.

30. Run the **FASTACAD** program, or restart your system (if you've modified the **AUTOEXEC.BAT** file) to start the driver.
31. Change the AutoCAD display device configuration by starting AutoCAD, and then from the main menu, select option 5, *Configure AutoCAD*. From there, select option 3, *Configure Video Display*. Choose the **ADI P386** display driver option as your display device. For more details, please refer to the *AutoCAD Installation and Performance Guide*.
32. If you are going to be using AutoShade 2.0 w/RenderMan or 3D Studio with this driver, read section 15.12, on how to configure these packages to work with DLD386-VGA.
33. You are now ready to use your accelerated AutoCAD. If you are not sure that AutoCAD is using DLD386-VGA, type: **DLDUSAGE** at the AutoCAD command prompt while editing a drawing. If DLD386-VGA is loaded and running, this command should return information about memory usage. If AutoCAD reports an error instead, your DLD386-VGA is not properly loaded.

17.5 Changing Colors

The DLD386-VGA supports *CustomColors* color configuration. What's so unique about *CustomColors* is that it gives you the ability to modify all your AutoCAD colors, including menu colors, text colors, dialog box colors and even drawing colors.

CustomColors simulates an AutoCAD screen, complete with all possible objects. For editing the color configuration when you are running AutoCAD in 16 colors on a VGA, use **COLOR16.EXE** to load *CustomColors*, and for the 256-color VGA modes use **COLOR256.EXE**. Once you enter the utility, you are provided with the following configuration menu at the bottom of the screen:

(O)bject,
(D)rawing,
(P)hysical,
(A)DI pal,
(V)GA pal,
(R)eset,
(L)oad,
(S)ave,
(E)xit

NOTE:

In **COLOR256**, there is no (D)rawing option.

In the following commands, select the first letter only.

(O)bject

Selecting **O** enables you to change the color of any AutoCAD screen object, such as the graphics area background color, the menu area text color or the border line color.

Select the object whose color you want to change by moving the highlighted box around using the left and right cursor control keys and pressing **Enter** when you have highlighted the desired object. Note that a one line description of the object type is displayed at the top of the screen as you move the box around.

Once you have selected the object, another highlighted box will appear around the color boxes, nearest the bottom of the screen. These are the physical colors that the VGA board supports. Use the left and right cursor keys (as well as the up and down keys in the 256 color mode) to select which physical color should be used for the object you have selected and hit **Enter**. The screen will quickly redraw with the new color selection for the object you have chosen, and you will be back at the start of object selection, in case you want to change the color of another object.

It is important to note that when you change the background color to a new color, all drawing colors identical to that new color, will be swapped with the previous background color in **COLOR16**.

For example, if your current background color is white and you change it to blue, all the boxes in the drawing color area (middle of the screen in 16 color mode) that used to be the same shade of blue will become white. In the 16 color mode, drawing color 0 always reflects the background color.

In **COLOR256**, changing the background color will only cause physical color 0 to assume the same color as the color you have selected. No other colors will be affected, unless you have chosen color 0 for another object, in which case it will have the same color as the new background.

NOTE:

Any time during color configuration, you can press the **ESC** key once or twice and return to the configuration menu. Also, pressing the question mark (**?**) key will provide you with context sensitive **HELP**.

(D)rawing

This option allows you to modify all the AutoCAD drawing colors (color 0 through 255) in a fashion similar to the way you change object colors.

NOTE:

In COLOR256, this option is not available since you can directly modify all of the 256 physical colors directly, therefore the remainder of this explanation applies only when using COLOR16.

When this option is selected, a highlighted box appears in the drawing color area of the simulated AutoCAD display. The box can be manipulated using the four cursor keys. You may notice that the drawing color portion of the display is laid out just as the CHROMA drawing supplied with AutoCAD.

When you hit **Enter**, the highlight moves down to the 16 physical colors, just as it does during the object color selection. Pick the physical color you want for the selected drawing color, using the arrow keys and then hit **Enter**, to have your selection take effect.

17**NOTE:**

The highlighted box used to select drawing colors and physical colors may at times be hard to see, namely, because of the background color you have selected. **CustomColors** was intentionally designed to work this way, because the highlighted box color happens to be the same as the one used by the AutoCAD crosshair cursor and the AutoCAD UCS icon.

So, if you can't see the highlighted box during the color configuration, you won't be able to see the cursor when running AutoCAD.

If you can't find another background color that *feels* right and still want to use the one that was causing you problems with the highlighted box, you can choose an alternate background color and then modify the associated physical color to suit your needs.

(P)hysical

Choosing the Physical option from the menu allows you to alter the red, green and blue components of the physical colors. A highlighted box will appear in the row of 16 physical colors at the bottom of the screen in COLOR16, or somewhere in the large block of 256 physical colors in COLOR256.

Use the arrow keys to select the color you wish to edit and press Enter. Three *sliders* will appear near the bottom of the display, with the horizontal position of the slider for each of the color components (red, green, or blue – RGB), indicating the relative intensity of the component. You can use the left and right arrow keys to move the slider for the selected component, or type in a number from 0 to 255.

Note that VGAs support only 64 intensities/color component, so an intensity of 0 is the same as an intensity of 3. The up and down arrows allow you to select which component you want to alter. As you manipulate the sliders, all objects on the display that are of the same color as the selected physical color will change in hue.

This way you can visually determine the most appropriate setting for your display. Pressing Enter will set the RGB values you have selected for the physical color you were modifying.

(A)DI pal

This constructs a default ADI color palette, as defined in the *Autodesk Device Interface Driver Development Kit*.

(V)GA pal

This constructs a default VGA color palette, as defined when you select the VGA display device during AutoCAD configuration.

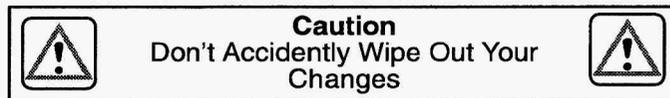
(R)eset

This option will reset the physical colors to their initial state. The initial state depends on which of the two palettes (ADI or VGA) you selected prior to choosing this command. If you are selecting this option in a freshly loaded version of COLOR16 or COLOR256, the initial palette will be assumed to be the ADI palette.

(L)oad

This reloads the color information from the file **DLDCOLOR.DAT**. It will be loaded from the directory pointed to by **DLDCFG**, or from the current directory if **DLDCFG** is not set. If **DLDCOLOR.DAT** cannot be found, an error message will be displayed.

This command is useful because it allows you to go back to your previously edited color configuration, in case you have made some mistakes in configuring your colors that you want to undo.



Selecting (A)DI pal, (V)GA pal, (R)eset or (L)oad will irrevocably wipe out any current color changes you may have made, unless you have just saved your new setting; so use them only when you really need to, such as when you have made so many color changes that you can't seem to get back to a reasonable place and just want to start over.

(S)ave

Save the current color palette in **DLDCOLOR.DAT**. It will be saved in the directory pointed to by **DLDCFG**, or in the current directory, if **DLDCFG** is not set.

(E)xit

Exits *CustomColors*. If you have made palette changes, but not saved them, you will be asked if you want to save your changes before exiting.

17.6 Advanced Features

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

17.6.1 Memory Meter

While in AutoCAD, you can check how much memory the display list and fast-redraw list are occupying at any time. The way to do this is by typing **DLUSAGE** at the Command prompt. **DLUSAGE** will return information on how much memory each viewport is occupying. Since AutoCAD can support up to sixteen viewports, it is possible to have up to sixteen display lists. But multiple viewports don't necessarily have to use multiple display lists, even though each viewport will have its own fast-redraw list, because of an AutoCAD feature known as slave viewports.

If a viewport is a slave of another viewport (known as the master viewport), then the slave and the master share the same display list, and therefore only the master viewport will show memory in use for a display list when using **DLUSAGE**.

17

17.6.2 Display List Cleanup

While in the Overwrite mode for display list maintenance, the display lists can get quite large, because of multiple ERASEs, MOVEs, ROTATEs, etc. (see: *The Remove/Overwrite Option*).

The same may occur, although at a slower pace, in the Remove mode. Instead of having to do a **REGEN** to recreate the display lists from scratch, you can use the **DLDCLEAN** command to clean up the display lists. The **DLDCLEAN** command removes all deleted objects from the display lists and it requires as much time as an AutoCAD REDRAW. Note that the whole display will be erased and recreated as part of this clean up process. In a multiple viewport setting, this means that all viewports and their associated lists will be cleaned up.

17.6.3 Current Color/Layer Indicator

Another feature that will simplify drawing under AutoCAD is the addition of a small, outlined box on the left edge of the status line. Inside the box is the current AutoCAD drawing color. If the status line is disabled, this box will not appear.

As of version 1.1, DLD386-VGA supports a number of new AutoCAD command line commands designed to allow advanced users better control over display list processing:

DLDHELP

Provides a one-line summary for every special DLD386-VGA command. It is recommended that you flip to the text screen to view the output.

DLDVER

Displays DLD386-VGA version and serial number.

DLDDLMODE

Displays the current mode of your redraw and display list (i.e. Remove, Overwrite, or Disabled).

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

DLDFREEMEM

Frees up all display list memory currently in use by DLD386-VGA and performs a DLDCLEAN. This is useful when DLD386-VGA has gone a long time without a DLDCLEAN and has allocated more memory than is necessary. You may want to use this command instead of DLDCLEAN.

DLDDLISTRM

Puts the display list in Remove mode

DLDDLISTOV

Puts the display list in Overwrite mode

DLDDLSTDS

Disables the display list

DLDFLISTRM

Puts the fast redraw list in Remove mode

DLDFLISTOV

Puts the fast redraw list in Overwrite mode

DLDFLSTDS

Disables the fast redraw list

17.7 Memory Usage and Lists

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

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

How much memory? For production use, we recommend that at least 1 megabyte be available for DLD386-VGA. To determine how much memory AutoCAD is using, use the **STATUS** command while in AutoCAD (refer to Section 4.4.1, page 37, in the *AutoCAD Installation and Performance guide* for more information.)

The Display List for a simple drawing, such as the shuttle Columbia, might require only 20 Kbytes. Complex drawings may require several megabytes. We have seen Display Lists for a drawing range from one-tenth the size of the drawing file to three times the size. In general, the Display List averages about about the same as the DWG file size. The Fast Redraw List will also occupy some memory, with the worst case being that it occupies as much as the Display List. This means that you should count on both lists generally taking up as much as twice the DWG file size. Also, complex objects such as circles and text *expand* when translated into display list format, so a drawing with a lot of complex objects and text will have a larger display list than a simpler drawing.

NOTES:

Text takes up a disproportionate amount of space in the Display List. To keep the list small, put text in its own layer of the drawing; then don't display the text layer when editing the rest of the figure. This will keep memory consumption down and speeds up execution.

17

The AutoCAD manuals have an excellent section on performance, concentrating on memory usage. To get the most performance out of the program, read the appropriate sections of those manuals, as well as this one.

If you find that your DLD386-VGA REDRAWS, PANs, and ZOOMs are causing excessive hard disk accesses (due to paging or swapping), you are probably running out of RAM space. At this point you have three options:

1. Start using the **DLD CLEAN** command more frequently.
2. Disable the Fast Redraw List, which will slow down your redraws and give you a little more RAM to play with; or
3. Buy at least one or two more megabytes of 32-bit RAM. The latter will greatly improve your productivity under AutoCAD.

You may want to use the DLDUSAGE command, described in the previous section, to keep tabs on your display list usage as time goes on.

Your system may not have enough memory to manage large drawings without excessive paging and also simultaneously support the Display List and the Fast Redraw List. This may happen because DLD386-VGA makes AutoCAD run so much faster that you want to work with larger drawings! After a certain amount of time spent adjusting memory parameters, the only way to do your work at top speed is to buy more memory.

17.8 The Remove/Overwrite Option

During installation, you are asked if you wish to maintain the Display List and the Fast Redraw List by removing or overwriting erased vectors; you also have the option of disabling either or both lists, though this option is not needed for normal operations.

The Remove and Overwrite options come into play when you erase or move an object (moving is the same as erasing and then redrawing somewhere else.) When you erase, move or rotate an object, the Display List and Fast Redraw List must be updated to get rid of the *displaced* object. There are two ways to do this:

- **Remove option** – search the list for the offending vectors and remove them. This is the elegant solution, but the search takes a measurable amount of time.

For small drawings, the extra time will not be noticeable, but for large drawings it most likely will be. If you are editing large portions of sizeable (over 100K) drawings, make sure to use the Overwrite option documented below.

- **Overwrite option** – add more vectors to the list to overwrite the offending vectors with new vectors in the background color.

This avoids the time loss to find and remove the vectors, but causes a strange effect: when the screen is updated, the erased object is drawn, then disappears as it is overwritten by the new vectors in the background color!

This slows each redraw, and the extra **overwrite** vectors add to the length of the list. Fortunately, if things get too messy, all you need to do is use the **DLDCLEAN** command, which will clean up the display list in about the time it would take for AutoCAD to perform one of its REDRAWs.

We recommend that you use Remove mode for both lists for small drawings or, if you have a relatively small amount of memory for the lists. For medium-sized drawings, you may want to go to Overwrite mode for at least the Fast Redraw List, so that redraws will be speeded up, but the Display List will still be updated correctly. This will minimize the strange *draw then undraw* effect for erased objects. For even larger drawings, where searching and updating a list takes a lot of time, you will want to go to Overwrite mode for both lists. Remember to use the **DLDCLEAN** command occasionally as you erase and move more objects.

17.8.1 VIEWing the Full Drawing

Since DLD386-VGA is totally transparent to users with respect to using normal AutoCAD commands to REDRAW, PAN, and ZOOM, you still have to suffer from some of AutoCAD's nuances. One of these nuances is that ZOOM ALL and ZOOM EXTENTS both force a REGEN, because AutoCAD does not keep track of various boundaries necessary to avoid the REGENs. REGENs are rather time-consuming and don't use any display list processing to speed themselves up. One way around this problem is to use another of AutoCAD's built-in features, namely the VIEW command.

When you first load your image and see the whole drawing on the screen at once, just type: **VIEW Save ALL**, which will save the display position you see under a view named **All**. After you've done some detailed editing and want to return back to the big picture, type:

VIEW Restore ALL, instead of **ZOOM All** or **ZOOM Extents**, and the full drawing will be restored to the display at display list speeds, without a **REGEN**.

17.8.2 Avoiding Accidental REGEN's

Another nuance of AutoCAD is that if you **ZOOM** in too far or **PAN** over too far, you may inadvertently cause a **REGEN**. AutoCAD again provides a very simple solution: the **REGENAUTO** command. Just type **REGENAUTO Off** at the AutoCAD command prompt, and automatic **REGENs** will be disabled. The **REGENAUTO** setting is also saved as part of your drawing file, so you only need to execute it once per drawing. You may even want to set **REGENAUTO** off in your **ACAD.DWG** drawing template, so that all your drawings are created with **REGENAUTO** set off.

17

17.8.3 Adding DLDCLEAN to your Pull-downs

If you find that you are frequently using the **DLDCLEAN** command, you may want to add it to your pull-down menus. We recommend adding it to the **DISPLAY** menu. This can be done by editing the file **ACAD.MNU**, which contains the commands for all your pull-downs, as well as the side menus. Make sure to make a backup copy of **ACAD.MNU** first! Search the file for the **Display** menu definition (usually found after a line that says *****POP4**.) Go to the end of the definition, just past the line that starts off with **[Set Viewports...]**, and add the following two lines:

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

Once these two lines have been added, save the edited **ACAD.MNU** file and run AutoCAD. Pull up a drawing that uses the standard AutoCAD menus, and AutoCAD will recompile the **ACAD.MNU** file into **ACAD.MNX**. Once this compilation is complete, you should be able to use the **Clean Display List** pick off of the **Display** menu to clean up **DL386-VGA's** display lists for all your normal drawings.

17.9 Using 3D Studio and AutoShade 2.0

17.9.1 AutoShade 2.0 with RenderMan

To configure AutoShade v2.0 to use DLD386–VGA, start AutoShade with **SHADE /R**, which will allow you to reconfigure AutoShade. For the display device, select **P386 AutoDesk Device Interface display driver**, and for the rendering display select the **P386 AutoDesk Device Interface rendering driver**. If you are running the display and rendering screen on the same monitor (i.e. single monitor), make sure to tell AutoShade this. By the way, a single monitor approach will require a redraw of the display screen after a rendering screen,.

17.9.2 Autodesk 3D Studio

To configure 3D Studio, you need to edit the **3DS.SET** file, located in your 3DS directory. Locate the line that starts with **DEFAULT–DISPLAY**. You want to modify it so that the line reads: **DEFAULT–DISPLAY=RCPADI**. Do the same with the line that starts with **MAIN–DISPLAY** (i.e. **MAIN–DISPLAY=RCPADI**). Make sure to remove the “;” in front of these lines. Also, if you selected to use the 256 color VGA driver during the set up, you may change the **MATERIAL–DISPLAY** line in 3DS.SET as well. Save your changes, and you’re ready to use 3D Studio. See your 3D Studio installation documentation for additional information on configuring 3D Studio.

18. The Ventura 2.0 Drivers

The Ventura Drivers support the Ventura Publisher Release 2.0 software. They provide the following resolutions:

800x600	16 colors	graphics
1024x768	16 colors	graphics

18.1 Installing the Ventura 2.0 Drivers

1. Install Ventura Publisher, specifying **VGA, 640x480, 2 colors** as the graphics device.
2. Slide diskette #1 into drive a.
3. Type: **a:** (Press: **Enter**)
4. Type: **setup** (Press: **Enter**)
5. Press any key to continue.
6. Select **Ventura Publisher** (Press: **Enter**)
7. Select the desired driver(s) (Press: **Enter**)
8. (Press: **End**)

Before copying selected drivers to your hard-disk, the SETUP program will display the current drive and the sub-directory where the drivers will be copied to.

9. Insert the path you wish to choose (Press: **Enter**)
10. You now will get the message:

After installing the drivers on your hard drive, you need to copy the files to a floppy disk on drive A. Run the program VPDRV2_0.EXE from drive A to install the drivers.

11. Follow instructions
12. After you return to DOS, change directory to where you had installed Ventura Publisher and copy the following files to a floppy in drive a:
VP2_0.txt VPDRV2_0.EXE
SD1024.VGA, SD800.VGA
13. Execute **vpdrv2_0** from drive a and respond to the questions.
14. When the program asks you to specify the display device and resolution, select one of the drivers you just installed.

19. The GEM 3.0/3.1 Drivers

The GEM Drivers are compatible with GEM Release 3.0 and 3.1. They provide the following resolutions:

800x600	16 colors	graphics
1024x768	16 colors	graphics

If you do not have GEM installed on your PC, follow the procedure provided in the GEM documentation to install GEM 3.0/3.1 with the standard VGA screen driver.

Installation procedures for a single drive system and a double drive system are outlined. In either case make certain that you first install GEM 3.0/3.1 with the standard VGA screen driver.

19.1 Procedure for a single drive system.

1. Create a GEM DRIVER PAK DISKETTE – the assumption is that drive **A** will be used.
2. Insert a blank diskette in drive **a**, and format it by typing:
format A:/V (Press: **Enter**) (on some DOS Versions type: format A:)
The formatting will take some time and it will provide feedback as to its progress.

3. **FORMAT** will prompt for a volume label with the following message:

Volume Label (11 characters, Enter for none)?

Enter the following text using **upper case**:

GEM DRIVRPK (Press: **Enter**)

Information will now be echoed to the screen, answer **N** to the question:

FORMAT ANOTHER (Y/N)?

4. Label this diskette: **GEM Driver Pak**
5. Go to the root directory on your hard disk.
6. Create a new directory for temporary storage of the GEM 3.0/3.1 driver files by typing:
mdlgemdrvrs (Press: **Enter**)
7. Slide Diskette #1 into drive **a**:
8. Type: **a:** (Press: **Enter**)
9. Type: **setup** (Press: **Enter**)
10. Press any key to continue.
The **SETUP** main menu will display the names of all the utility and driver programs.

11. Select **Digital Research GEM V 3.0 or 3.1**

Press: **Enter**

12. Select the desired resolution Press: **Enter**

13. Press: **End**

14. You now will get the message:

Enter the [drive:path] for installation.
[B:\]

Before copying selected drivers to your hard-disk, the SETUP program will display the current drive and the sub-directory where the drivers will be copied to. You can change the drive and the directory by typing over the displayed one.

15. Insert the path **C:\GEMDRVRS** Press: **Enter**

16. The system will now instruct you to insert diskette #2

17. The system will now respond with:

Create path [C:\gemdrvrs] (Y/N)?

18. Type: **Y** Press: **Enter**

The installation will now begin.

19. Press: **Esc**

20. After you have been returned to the main menu

Press: **Esc** to return to DOS.

The system will prompt with:

Do you really want to exit (Y/N)?

21. Type: **Y** Press: **Enter**

22. Return to the hard drive by typing c: Press: **Enter**

23. Copy the newly installed drivers to the previously formatted **GEM 3.0/3.1 Driver Pak** diskette; place it in drive **A** and type:

copy *.* A: Press: **Enter**

24. Insert the GEM 3.0/3.1 System Master diskette in drive a.

Type: **a:** Press: **Enter**

Type: **gemsetup** Press: **Enter**

25. From the main menu select:

CHANGE EXISTING CONFIGURATION

Press: **Enter**

19

26. Select: **CONTINUE**
27. Select: **CHANGE YOUR CURRENT SETUP**
28. Select: **VGA 16 COLOR 800x600** (depending on the previous setup this entry may be different – choose the appropriate option)
29. Select: **OTHER (Driver Pack)**
30. Insert the GEM Driver Pack that you created previously
31. Select: **CONTINUE**
32. Select: **VGA 16 COLOR 800x600**
33. Select: **SAVE AND EXIT FROM GEM SETUP**
34. You will now get a message:
Insert the disk labeled GEM DRIVER PACK
Ignore this message and select: **CONTINUE**
35. The GEM SETUP procedure is now completed.

19.2 Procedure for a dual drive system.

1. Insert a blank diskette in drive B, and format it by typing:
format B:/V

The formatting will take some time and it will provide feedback as to its progress.

2. **FORMAT** will prompt for a volume label with the following message:
Volume Label (11 characters, Enter for none)?
Enter the following text using **upper case**:
GEM DRIVRPK
Information will now be echoed to the screen, answer **No** to the question:
FORMAT ANOTHER (Y/N)?
3. Label this diskette: **GEM Driver Pak**
4. Run the drivers **SETUP** program as outlined on the previous page, using the path **B:** when prompted.
5. Return to the main menu and to exit to DOS.
6. Complete the installation by proceeding from step 11 of the previous section.

20. The WordPerfect 5.0/5.1 Option and Driver

Your SNAPplus Desktop Video Adapter has the capability to run WordPerfect (release 5.0) in 132-column text mode. No special driver is required to do this.

Follow these steps to configure WordPerfect for 132-column text mode:

1. Make sure the VMODE utility program is installed in your computer. If it is not, install it in your computer by following instructions provided in section 12.5, on page 40.
2. Use the VMODE utility to initialize 132-column text mode. For example, enter the following command:
[vmode 132x25]
3. Start WordPerfect. The program will automatically detect the number of rows and columns specified.
Note:
If for some reason the program is unable to adapt to the 132x25 mode, start WordPerfect with the following command:
[wp /ss=25,132]
4. When you exit WordPerfect, you can return the program to the normal 80-column text mode by typing a command

similar to the following:
[vmode 80x25]

20.1 Installing the WordPerfect Drivers

Two WordPerfect drivers are provided for the following enhanced modes:

800x600	16 colors	graphics
1024x768	16 colors	graphics

1. Slide diskette #1 into drive A.
2. Type: **a** (Press: **Enter**)
3. Type: **setup** (Press: **Enter**)
4. Press any key to continue.
The SETUP main menu will display the names of all the utility and driver programs.
5. Select Wordperfect (Press: **Enter**)
6. Select the desired driver(s) by following the instructions appearing in the bar at the bottom of the screen
(Press: **Enter**)

7. Press: **End**

8. You now will get the message:

Enter the [drive:path] for installation.
[C:\ WP51

Before copying selected drivers to your hard-disk, the SETUP program will display the current drive and the sub-directory where the drivers will be copied to. You can change the drive and the directory by typing over the displayed one.

9. Insert the path you wish to choose Press: **Enter**

10. You now will get the message: (if the drive:path does not already exist)

Create path [C:\] (Y/N)?

11. Type: **Y** Press: **Enter**

The installation will now begin.

12. Press: **Esc**

13. After you have been returned to the main menu

Press: **Esc** to return to DOS.

The system will prompt with:

Do you really want to exit (Y/N)?

14. Type: **Y** Press: **Enter**

15. After you have been returned to DOS, change directory to where you had installed Wordperfect and start WordPerfect; i.e. type:

WP Press: **Enter**

16. Once you are in WordPerfect follow instructions

17. Press the **SHIFT** and **F1** keys to enter the SETUP menu.

18. Select option **(3) Display**.

19. Select option **(5) Screen Type** and choose **Tseng Labs 800x600 16-colors or Tseng Labs 1024x768 16-colors**, corresponding to the driver you installed.

Note: These enhanced resolutions are utilized for the WordPerfect Document Preview mode only.

21. The OS/2 Presentation Manager Drivers

The OS/2 Presentation Manager drivers support the following resolutions:

800x600	16 colors	graphics
1024x768	16 colors	graphics

21.1 Installing the OS/2 Drivers

1. Slide diskette #1 into drive A.
2. Type: **a** (Press: **Enter**)
3. Type: **setup** (Press: **Enter**)
4. Press any key to continue.
5. Select OS/2 Presentation Manager (Press: **Enter**)
6. Select the desired driver(s) (Press: **Enter**)
7. (Press: **End**)

8. Before copying selected drivers to your hard-disk, the **SETUP** program will display the current drive and the sub-directory where the drivers will be copied to.
9. Insert the path you wish to choose (Press: **Enter**) and follow instructions appearing on the screen.
10. After you return to the main menu (Press: **Esc**) to return to DOS.
11. Change directory to where you had installed OS/2 and start OS/2
12. Ensure that the driver is copied to the directory defined by the **LIBPATH** environment variable.
13. Rename the driver **DISPLAY.DLL**

Notes: The **DISPLAY.DLL** file residing in the directory defined by **LIBPATH** is the standard VGA 640x480, 16 color driver. You might want to save it before performing step 12.

The desired driver can not be copied to the **LIBPATH** directory while Presentation Manager is running as OS/2 will lock the existing **DISPLAY.DLL** in place.

22. Video Tutorial

To the beginner it may seem odd that a special product, such as the SNAPplus Desktop Video Adapter, is needed to display video on a computer monitor. The reason is that video signals, processed by Television, Camcorders or VCRs, are different from video signals used by computers. The SNAPplus Desktop Video Adapter provides a bridge between these video standards.

22.1 Definition of Terms

- **Composite– Video**
A composite–video signal is transferred over a single conductor, usually a coaxial cable with an RCA phono jack as a termination.
- **S–Video**
An S–Video signal is transferred over two conductors, plus ground(s.) One conductor carries the luminance and the other conductor carries the color information. Generally a four conductor cable with a four pin mini–DIN connector is used.

- **RGB–video**

An RGB–video signal is transferred over four conductors, plus ground(s.) There is one conductor each for the red, blue and green information, and one for sync; sometimes sync is carried on the green information, so only three conductors are needed. Generally coaxial cables with BNC type connectors are used.

Composite–video is very common because of its simplicity (one cable only.) It is also the original Television standard, however, it offers the poorest video quality.

S–Video is becoming very common because it is easy to use on consumer video equipment; i.e. VCRs, Camcorders etc. and it offers reasonably good picture quality.

RGB–video is less common but is frequently used because it offers the highest picture quality.

In general, composite–video should be avoided because of its poor picture quality. RGB–video should be used when the highest picture quality is required. S–Video is probably used the most because of its extensive support and reasonably good picture quality.

22.2 NTSC vs. PAL

NTSC and PAL are standards that specify timing characteristics of composite-video, S-Video and RGB-video. NTSC is generally used in the United States and Japan, while PAL is generally used in Europe.

The SNAPplus Desktop Video Adapter can accept either NTSC or PAL as inputs.

On the SNAPplus Desktop Video Adapter NTSC output is enabled when running 640x480 graphics mode only.

22.3 Non-Interlacing vs. Interlacing

The video input and output of the SNAPplus Desktop Video Adapter, like all Television type video, is interlaced. Interlaced video will flicker, which causes eye strain when viewed for a long time.

The flicker is most apparent in horizontal lines. While lines of that type usually do not appear in video generated by VCRs and Camcorders, computer generated images often contain such lines. Thin horizontal lines in computer graphics should therefore be avoided.

The VGA graphics output of the SNAPplus Desktop Video Adapter is non-interlaced; except for 1024x768 and 1280x1024 resolutions.) Non-interlaced video will not flicker and hence is much easier for viewing – eye strain is reduced.

22.4 Write-protected VCR Tapes

Many VCR tapes are write-protected in order to prevent unauthorized copying of this information. When viewing the video output of such tapes on the SNAPplus Desktop Video Adapter, the top portion of the screen may be skewed.

23. Technical Description

For the following technical description please refer to the block diagram on the next page.

The Video DECODER circuit allows one of three video inputs to be selected, and processes the selected signal into separate RGB signals. The video inputs can be composite, S-Video or RGB at either PAL or NTSC rates. The decoder contains hue, saturation, brightness, contrast and gain adjustments which are software-programmable through the I²C (I-squared-C) bus.

The GENLOCK circuit generates a high frequency clock which is phase-locked to the horizontal sync of the incoming video. This clock is utilized by the logic to digitize the incoming video. The ADC converts the analog RGB signals into digital form. Each color channel is digitized into an eight bit value, so that each video pixel is represented by a 24-bit number. Each frame of video is digitized into an array of 640 x 480 pixels.

The IMAGE CONTROLLER controls writing and reading of the digitized video data into IMAGE MEMORY. The image memory is dual-ported, so that data can be simultaneously written/read through two separate channels.

Generally, the first (parallel) port is used to write ADC data into the image memory, so that the image memory simply contains a digitized replica of the video input. Alternatively, the parallel port can be set up to allow PC software to write or read the image memory. The second (serial) port is used to read data out at VGA monitor rates.

The IMAGE CONTROLLER and memory can be configured for either 15 bit, 16-bit or 24-bit modes. As the ADCs always generate 24-bits, the image controller discards the lower bits when in the 15 or 16-bit mode. The choice of the mode is determined by the currently selected graphics resolution. For 640 x 480 resolutions, either 15 bit, 16-bit or 24-bit is acceptable. However, when either 800 x 600 or 1024 x 768 graphics resolution is used, 15 or 16-bit mode must be used.

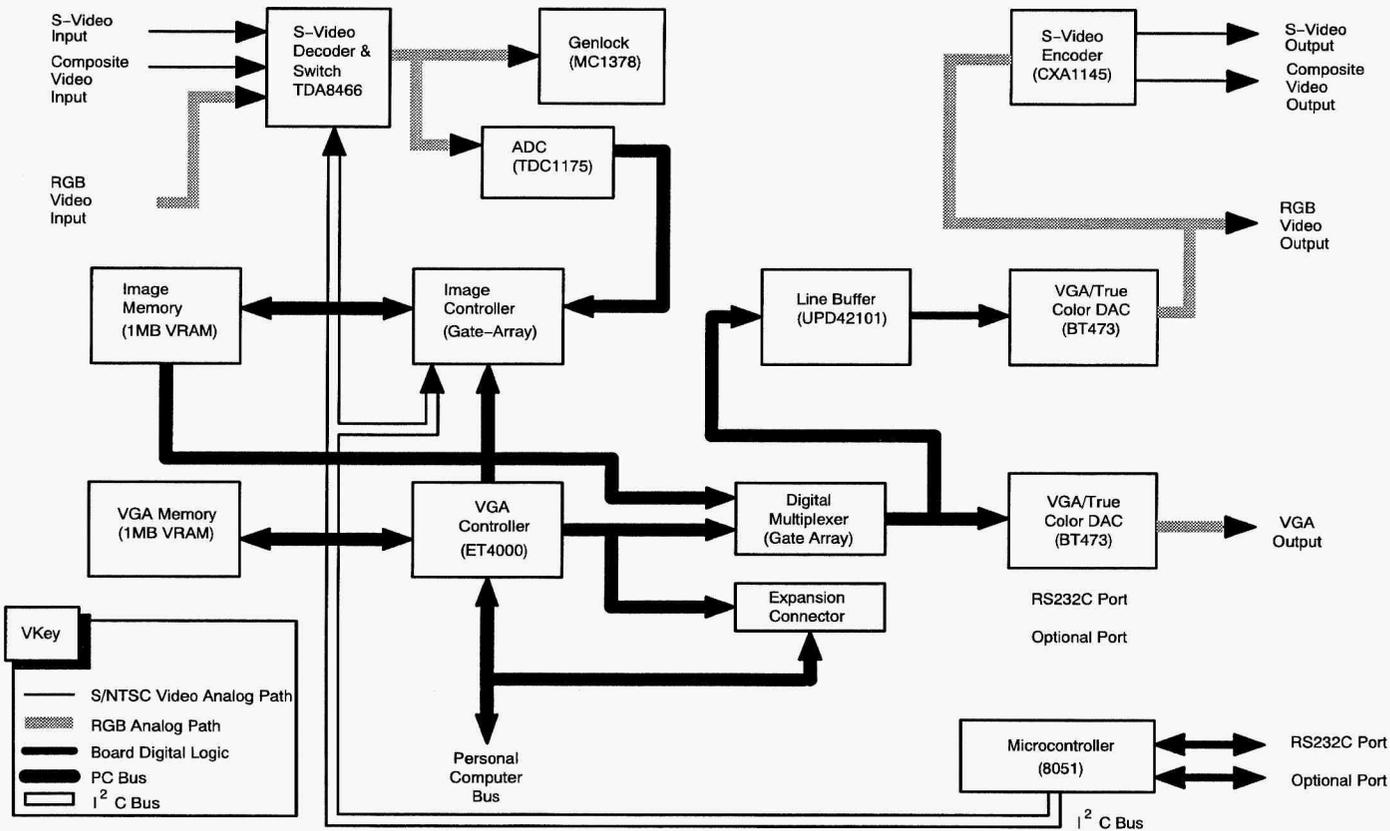
The VGA CONTROLLER and VGA MEMORY form a high-performance VGA graphics system. This graphics controller implements all of the standard graphics capabilities required by a PC, plus many additional ones. It is based on the popular Tseng Labs ET4000 architecture.

The **DIGITAL MULTIPLEXER** allows pixel-by-pixel switching of the video output between the digitized video and graphics data. The switching can be based on the graphics color or by X-Y coordinates of the video. The output of the multiplexer feeds the **VGA/TRUE COLOR DAC**, which converts the digital video data into analog form appropriate for driving monitors.

The **LINE BUFFER** converts the output of the digital multiplexer from VGA monitor rates to NTSC video rates. Another **VGA/TRUE COLOR DAC** converts digital video data

into analog form. This video (at NTSC rates) is output as RGB, and via the **S-Video ENCODER** as composite or S-Video.

The **MICRO CONTROLLER** implements a communication channel for controlling selected video equipment. As an option an **EXPANSION** socket can be added to accommodate daughter boards. These boards contain provisions for true 24-bit graphics, video compression/decompression and a large character font ROM.



24. Appendix

Specifications

The SNAPplus uses industry standard hardware to interface with peripheral devices.

Video input

RGB-video, S-Video and composite-video; either PAL rates or NTSC

All inputs are 75 Ω . The RGB-video and S-Video inputs are 0.7V p-p, while the composite-video input is 1.0V p-p. The composite sync input is RS170 and can range from 0.7V to 5.0V. Video input socket is a 8 pin mini-DIN

Video output

Provides RGB-video, S-Video and composite-video at NTSC rates.

NTSC output is enabled when running 640x480 graphics mode only.

All outputs are 75 Ω , 8 pin mini-DIN sockets.

VGA output

VGA socket is 15 pin hi-density D-subminiature

Video adjust

The following parameters are software-programmable: RGB-Video, S-Video, NTSC or PAL and composite-video input selection; brightness, contrast, hue (S-Video and composite-video only); saturation (S-Video and composite-video only); red, green and blue channel gains.

Video A/D

Video is digitized to 15, 16 or 24 bit resolution, up to a maximum of 640x480.

Scaling

Input can be scaled from 0 to 100% in increments of approximately 2.5%.

Graphics

Video input is permitted for all resolutions up to 860x600 (for resolutions exceeding 640x480 video input will not be full-screen.) For resolutions exceeding 640x480, only 15/16-bit video digitization is permitted.

Resolutions:

- all standard VGA resolutions
- 132x43, text
- 640x480, 32,768 or 65,536 colors
- 800x600, 32,768 or 65,536 colors
- 1024x768, 256 colors (interlaced, non-interlaced)
- 1280x1024, 16 color (interlaced)

Zooming

The digitized video can be zoomed (horizontally and/or vertically) by a factor of 1 to 15.

CPU bus

16-bit ISA (EISA compatible)

Card size

3.90 x 13.0, (PC/AT compatible)

Power

15 watt maximum

Registration

FCC Class A approved; (class B pending)

Options

One Input/Output cable kit, consisting of:

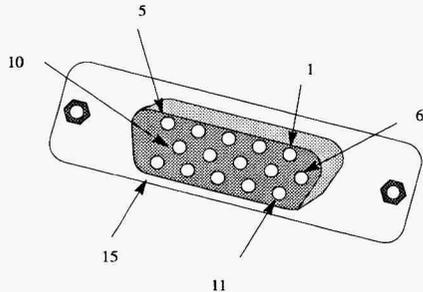
- One BNC type RGB-video cable
- One D-sub type RGB video cable
- One S-Video cable
- One composite-video cable
- A software developer's kit - SDK

Pin Descriptions

15 pin hi-density D-subminiature Output Socket;

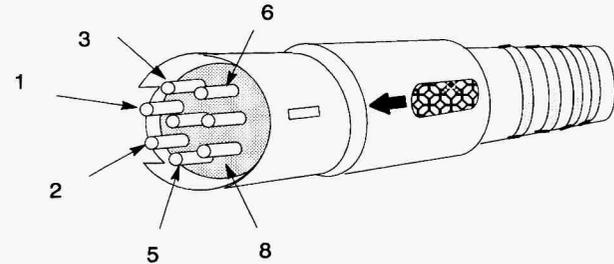
1	red	9	NC
2	green	10	sync gnd
3	blue	11	NC
4	NC	12	NC
5	gnd	13	hor. sync
6	red gnd	14	vert. sync
7	green gnd	15	NC
8	blue gnd		

NC = no connection
gnd = ground



Input and Output Video Connector; 8 pin mini-DIN

1	gnd	4	chrominance	7	green
2	luminance	5	composite video	8	blue
3	gnd	6	red		



24

SNAPplus MCI Drivers

The SNAPplus MCI driver includes support for the Microsoft MCI driver specification for Video Overlay devices and adds extended commands for features specific to the SNAPplus adapter. The Video Overlay commands are explained in detail in the Microsoft Multimedia Developer's Kit Programmers Reference and also in this document.

24

Installing the MCI Driver

1. Copy the file SNAP.DLL from the SNAPSHOT directory to the WINDOWS\SYSTEM sub-directory.
2. Start Windows with MME or 3.1.
3. Open the Control Panel application from the Main Program Group.
4. Click on the Drivers icon.
5. Click on the Add button.
6. Click on the New or Unknown Driver option.
7. Enter the name or path to the directory where the SNAPplus MCI driver resides. This would typically be SNAPSHOT\MCI.
8. A list containing only the SNAPplus MCI Driver (MCISNAP.DRV) should appear. Click on this to select it.
9. The SNAPplus MCI Driver Setup dialog box should appear. Select the correct video input and video rate for your equipment and adjust the BCSH and RGB values to get the best picture. Click on OK when you are done.
10. Your driver is now properly installed. You can change the setup options anytime by opening the Control Panel, selecting the SNAPplus MCI driver and clicking on the Setup button.
11. Close the Control Panel.

To use the SNAPplus MCI commands in your Windows applications with MCI support, use the commands as they are explained on the following pages.

Sample Application

To test a simple program using the SNAPplus MCI commands try the following sequence in your MCI application:

Open overlay style popup

Window overlay state show

Close overlay

You should see a video window with the video frame scaled to the size of the window you opened.

MCI Command Strings

Open overlay [param param param ...]

Opens the SNAPplus MCI driver.

Param:

ALIAS alias_name

Assign a shorthand name to replace 'overlay'.

PARENT hwnd

Set the parent pointer of the overlay window.

STYLE 0 – 4, 294, 967, 295

Set the style of the overlay window. The valid window styles are defined in Microsoft's WINDOWS.H file.

STYLE CHILD

Open the overlay window as a child window.

STYLE OVERLAPPED

Open the overlay window as an overlapped window.

STYLE POPUP

Open the overlay window as a popup window.

TYPE device_type

Type of device to open. Always use 'overlay' for the SNAPplus.

Close overlay

Closes the SNAPplus MCI driver. No parameters are needed.

Info overlay [param param param ...]

Gets information about the SNAPplus MCI driver.

Param

Return

PRODUCT

Cardinal SNAPplus MCI v0.90 Beta

WINDOW TEXT

video window caption

Capability overlay [param param param ...]

Gets capabilities of the SNAPplus MCI driver.

Param

Return

DEVICE TYPE

overlay

WINDOWS

1

CAN EJECT

False

CAN PLAY

False

CAN RECORD

False

COMPOUND DEVICE

False

USES FILES

False

CAN FREEZE

True

CAN STRETCH

True

HAS AUDIO

False

HAS VIDEO

True

CAN SAVE

True

Set overlay [param param param ...]

Controls the SNAPplus video functions.

Param**VIDEO on or off**

Turn video display on or off.

SOURCE composite or s-video or rgb separate sync or rgb sync on green or 1 or 2 or 3 or 4

Selects video source. 1 is composite video, 2 is s-video, 3 is rgb separate sync, 4 is rgb sync on green.

Param**HUE 0 – 255**

Set video hue value.

BRIGHTNESS 0 – 255

Set video brightness value.

CONTRAST 0 – 255

Set video contrast value.

SATURATION 0 – 255

Set video saturation value.

RED 0 – 255

Set video red component.

GREEN 0 – 255

Set video green component.

BLUE 0 – 255

Set video blue component.

KEY COLOR 0 – 4,294,967,295

Set video key color to the supplied RGB value. The color is set to a 24 bit (8-bits red/8-bits green/8-bits blue) RGB value. The key color command should only be used when using a 32,768 or 65,536 color graphics driver. When the key color command is received, the video window is turned off and video will pass through the specified key color in the current window.

Status overlay [param param param ...]

Retrieves the status of the current SNAPplus video settings.

Param**Return****VIDEO**

True or False (on or off)

SOURCE

1, 2, 3 or 4

HUE

0 – 255

BRIGHTNESS

0 – 255

CONTRAST

0 – 255

SATURATION

0 – 255

RED

0 – 255

GREEN

0 – 255

BLUE

0 – 255

KEY COLOR

0 – 4,294,967,295

STRETCH

True or False

READY

True or False

WINDOW HANDLE handle of current window

MEDIA PRESENT true

MODE stopped

Freeze overlay

Freeze (perform a frame or field grab) of the current frame or field of video from the current video source.

Unfreeze overlay

Display live video in the video window.

Put overlay [param param param ...]

Defines the destination, frame, source and video acquisition rectangles.

Param

DESTINATION

Sets the destination rectangle to its default. The destination rectangle is the rectangle within the overlay window where video will appear. The default is the entire inside area of the window.

DESTINATION AT x position y position width height

Set the destination rectangle to the specified value.

FRAME

Set the frame rectangle to its default. The frame rectangle is the rectangle within the video frame buffer where incoming video video will be stored. The default is the upper left corner of the frame buffer extending to the lower right corner of the scaled incoming video.

FRAME AT x position y position width height

Set the frame rectangle to the specified value.

SOURCE

Set the source rectangle to its default. The source rectangle is the rectangle viewable frame buffer area. The default is the upper left corner of the video extending to the lower right corner of the video.

SOURCE AT x position y position width height

Set the source rectangle to the specified value.

VIDEO

Set the video rectangle to its default. The video rectangle is the rectangle of incoming video stored in the frame buffer. The default is the entire video rectangle (640 x 480).

VIDEO AT x position y position width height

Set the video rectangle to the specified value.

Where overlay [param param param ...]

Get the current destination, frame, source and video acquisition rectangles.

Param	Return
DESTINATION	x position y position width height
FRAME	x position y position width height
SOURCE	x position y position width height
VIDEO	x position y position width height

Window overlay [param param param ...]

Specify the window and/or window state for video display.

Param
HANDLE hwnd

Set the video window to the window specified by hwnd.

HANDLE DEFAULT

Set the video window handle to the default overlay window created by the driver.

STATE HIDE

Hide the current video window.

STATE ICONIC

Make the current video window an icon.

STATE MAXIMIZED

Maximize the current video window.

STATE MINIMIZED

Minimize and de-activate the current video window.

STATE MINIMIZED

Minimize the current video window.

STATE NO ACTIVATE

Display the current video window without activating it.

STATE NO ACTION

Display but de-activate the current video window.

STATE NORMAL

Activate the current video window and display in a non-minimized non-maximized state.

STATE SHOW

Activate the current video window and display it in its current state.

TEXT caption

Set the caption in the title bar of the current video window.

FIXED

Incoming video is cropped rather than scaled to the size of the window.

STRETCH

Incoming video is scaled to the size of the video window.

AT x position y position width height

Move the current video window to the size and position specified.

Load overlay [param param param ...]

Lloads an image into the video buffer.

Param

filename

Filename and extension of the file to load.

AT x position y position width height

Set the position in the frame buffer to load the incoming image. Default position is the upper left corner.

FORMAT TGA or BMP

File type to load and display. Default is BMP.

Save overlay [param param param ...]

Saves the contents of the current video frame buffer to disk in either TGA or BMP format.

Param

filename

Filename and extension of the file to save.

AT x position y position width height

Position offset within the frame buffer to save from. Default position is the upper left corner.

FORMAT TGA16 or TGA24 or BMP

File type to save. Default is BMP.

SNAPplus AVI Drivers

The SNAPplus AVI driver includes support for the Microsoft Video For Windows software. The SNAPplus AVI driver supports video capture to 8-bit, 16-bit and 24-bit AVI files.

Installation

1. Copy the file SNAP.DLL from the SNAPSHOT directory or the SNAPSHOT diskette to the WINDOWS\SYSTEM sub-directory.
2. Start Windows with MME or 3.1.
3. Open the Control Panel application from the Main Program Group.
4. Click on the Drivers icon.
5. Click on the Add button.
6. Click on the New or Unknown Driver option.
7. Enter the name or path to the directory where the SNAPplus AVI driver resides. This would typically be SNAPSHOT\AVI or the AVI directory of the SNAPSHOT diskette.
8. A list containing only the SNAPplus AVI Driver (AVISNAP.DRV) should appear. Click on this to select it.
9. The SNAPplus AVI Driver Setup dialog should appear. Select the correct interrupt which you have set on your SNAPplus card. You have a choice of interrupt IRQ11 or IRQ12. See section 2.1, on page 3.
10. Your driver is now properly installed. You can change the setup options anytime by opening the Control Panel, selecting the SNAPplus AVI driver and clicking on the Set-up button.
11. Close the Control Panel.
12. Use VidCap and VidEdit in the Microsoft Video For Windows software to capture and edit video clips.

NOTE:

If you receive error messages from VidCap about not getting interrupts on the video vertical blanking period, make sure you have set the interrupts jumper on the SNAPplus board (i.e. jumper P12 – see page 3.) If you continue to have problems, please contact Cardinal Technologies Technical Support.

Please return this **Service Form** with your shipment.

Model: _____ Your Name: _____ Company Name: _____

Address: _____ Phone #: _____ State: _____ Zip: _____

Your RMA number: _____ Country: _____

Please indicate payment method: MC ___ Visa ___ Money Order ___ Certified Check ___

Please provide card#:

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Card expiration date: ____/____/____

Your signature: _____

Product will be returned to you via UPS surface carrier.

Complete information below if to be returned to another address:

Name: _____ Company Name: _____

Address: _____ State: _____ Zip: _____

Country: _____

List all other products installed in your system: graphics cards, disk controllers, etc.

PC brand/type: _____ Monitor brand/type: _____

Important Warranty Information

Cardinal® Technologies warrants this product to be free of defects in workmanship and materials under normal use and service; the warranty period is one year. During this period servicing of your product will be free of charge. This warranty applies to the **original purchaser only**. Customer's sole and exclusive remedy and Cardinal's liability in the event of a defect is expressly limited to correction of the defect by adjustment, repair, replacement or substitution at Cardinal's option.

This warranty does not cover, and Cardinal Technologies is not responsible for, damage caused by misuse, neglect, fire, lightning, electrostatic discharge or modification of this product or damage resulting from the use of this product with hardware or software programs not provided or specifically recommended by Cardinal Technologies. If a defect should occur, ship this product, *postage paid*, along with **proof of purchase**, to Cardinal Technologies in its original container or equivalent by a traceable, pre-insured method since Cardinal Technologies cannot be held responsible for product lost or damaged during transit.

Except as specifically provided herein, there are no other warranties expressed or implied, including, but not limited to, any implied warranties of merchantability or fitness for a particular purpose and in no event shall Cardinal Technologies be liable for indirect, incidental, consequential or other similar damages arising out of any breach of this warranty or otherwise. All software including application programs are provided on an **as is** basis without warranty.

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



Cardinal®

Registration Card

Please fill in and return within 30 days of purchase

Model: _____ Purchase Date: _____ Purchase Price: _____

Your Name: _____

Company Name: _____

Address: _____ Phone #: _____

City: _____ State: _____ Zip Code: _____ Country: _____

Purchased from (dealer name): _____

City: _____ State: _____ Zip Code: _____ Country: _____

PLACE
STAMP
HERE

Product Registration
Cardinal Technologies
1827 Freedom Road
Lancaster, Pa 17601

For Technical Support call:

717-293-3124

717-293-3043 (FAX)

between 8:00 a.m. and 5:00 p.m. EST, Monday through Friday.

Cardinal's Bulletin Board Service can be accessed by dialing:

717 293 3074 - (14400, 8, N, 1)

America Online's Keyword is: **Cardinal**

Preparing Your Product for Servicing

All units in need of repair must receive an **RMA** number prior to service. This number is to appear on the outside of the package. To receive your **RMA** number call:

717-293-3124

Pack the product in its original, anti-static material. **DO NOT** wrap your product in a plastic bag or foam material of any kind. These materials promote electrostatic discharge which can seriously damage your product. If the original packing material is not available, wrap the product in aluminum foil and pack in a strong corrugated box. Generously pad it to prevent damage. **Do not use styrofoam as padding material. Failure to follow these packing instructions and provide proper static protection may void your warranty.**

Please **DO NOT** return the other materials you received with your product; i.e. diskettes, user documentation. We prefer that you keep these items. Be sure to include the **original** proof of purchase. Your original receipt will be returned. If you do not have proof of purchase, you will be charged for the service!

We recommend that you ship the package via UPS, or registered mail so that, if necessary, the package can be traced. Cardinal will not accept packages sent COD. Send your package *postage paid* to:

Cardinal Technologies, Inc.
Technical Support Center
1832 Freedom Road
Lancaster, PA 17601

Canadian Department of Communications Information

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in radio interference regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicable aux appareils numeriques de Classe A prescrites dans le reglement sur le brouillage radioelectrique edicte par le Ministere des Communications du Canada.

Federal Communications Commission Radio Frequency Interference Statement

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

1. This device may not cause harmful interference
2. This device must accept any interference received, including interference that may cause undesired operation.

Note:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

(054)

160-0362-001R03