



TECH SOURCE, INC.

**Raptor GFX-C
Installation and Reference
Manual**

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Chapter 1

INTRODUCTION

1.1 Overview

Thank you for purchasing a Tech Source Raptor GFX-C series product. This manual discusses the hardware and software installation and some technical reference material for the following products:

- Raptor GFX-FP graphics card which drives the 1600SW Digital Flat Panel display and/or analog monitors.
- Raptor GFX-32C graphics card which supports analog monitors with resolutions up to 1920x1200.

All systems vary to a degree, therefore knowledge of the features of your system and an understanding of UNIX shell scripts are helpful during the installation process.

The Tech Source Raptor GFX-C family of graphics cards is designed to enhance the capabilities of your Sun Microsystems PCI-based Ultra workstations and Enterprise servers. The Raptor GFX-FP and Raptor GFX-32C are the follow-on products to the popular Raptor GFX-8P (PGX32 from Sun Microsystems) graphics card.

The Raptor GFX-FP product is designed to drive the 1600SW Digital Flat Panel. All Raptor GFX-C products support 8 and 24-bit visuals (depths) simultaneously and resolutions up to 1920x1200. The resolutions and bit depths are software configurable.

NOTE: Raptor GFX-C will be used as a generic name for all the cards in the family throughout this manual.
--

1.2 Conventions

This manual will follow certain conventions throughout.

Whenever a variable name, command name, directory, or filename is used in a paragraph they will appear in a `mono-spaced` font.

At times the reader will be instructed to enter commands at a prompt. In this case a transcript of a sample session will be provided where a prompt similar to one the reader might see will be followed by the commands the reader is to enter. The entire transcript will be in a `mono-spaced` font with the prompt in a normal weight and the user's entries in **bold**.

The prompt used in a transcript varies depending on the circumstances. The following are some common prompts and when they are used:

<code>prompt#</code>	used when the user is required to have root privileges
<code>prompt%</code>	used when the user is not required to have root privileges
<code>ok</code>	prompt displayed when the user is in Boot PROM mode

Chapter 2

HARDWARE INSTALLATION

2.1 Installation Instructions

The Raptor GFX-C graphics card installation is simple and consists of a few easy steps. These installation instructions presume that you are familiar with the Solaris operating system.

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

- Step 1: Turn your computer OFF, remove the computer's cover, find an available PCI Local Bus slot, and remove the bracket and screw. Ground yourself by touching the metal part on the case.
- Step 2: Install the Raptor GFX-C card firmly into the PCI Local Bus slot. Take care to press it evenly and snugly into the slot. Once you are certain the card is installed properly into the slot, secure it with the bracket screw.
- Step 3: Secure the computer's cover, attach any previously removed cables, and connect the video cable to your monitor. If installing the GFX-FP, connect the 36 pin D ribbon cable to the 1600SW Digital Flat Panel connector located beside the DB-15 analog connector, on the front panel of the card.

If using the analog output, please note that some Sun monitors may require the DB-15 to 13W3 adapter (Refer to Appendix Section B.3).

NOTE: Simultaneous use of the analog and digital video outputs is not supported on the GFX-FP card.

Step 4: Turn ON the monitor before turning ON the computer so that the Raptor GFX-C can autodetect the proper resolution for your monitor.

NOTE: If the system is currently using a secondary graphics device, read section 3.5 on configuring the console device. The console device is the screen on which the boot up messages appear. The monitor must be connected to the console device before you proceed to Chapter 3 Software Installation.

The Raptor GFX-C is now installed and ready for software installation. Refer to Chapter 3 for installing the Raptor GFX-C Driver Software.

2.2 Resolution Settings

The resolution of the Raptor GFX-C is software configurable. For more information on changing resolutions refer to Section 3.4 and Appendix A.

The default resolution for the Raptor GFX-C card is listed in the table below.

Board	Resolution	Refresh	Bits/Pixels	Sync
GFX-C	Auto Detect	-	8+24	separate/composite

If the monitor does not support DDC2B/EDID protocol (auto-detect), and the console resolution is not set using methods described in Appendix A, the resolution will default to 1152x900@66Hz.

Chapter 3

SOFTWARE INSTALLATION

3.1 Overview

This chapter describes the software installation for a “Raptor GFX-C Driver Software”, which supports the following Tech Source, Inc. products:

- Raptor GFX-32C
- Raptor GFX-FP

NOTE: Please note that this software must be installed on your system prior to running X Windows on these cards.

The software is provided on CD-ROM or by FTP and is composed of the following packages:

- TSigfc 32-bit System Software/Device Driver
- TSigfcx 64-bit System Software/Device Driver
- TSigfcw Windows System Support Software
- TSigfcmm Manual pages

3.2 Requirements

The software currently supports the following Sun PCI based systems:

- Ultra 5
- Ultra 10
- Ultra 30
- Ultra 60

- Ultra 80
- Ultra AX
- Ultra AXi
- Enterprise 250
- Enterprise 450
- Enterprise 2500
- Enterprise 4500

NOTE: If your Sun PCI system is not listed here, please contact Tech Source, Inc..

The following are prerequisites for installing the “Raptor GFX-C Driver Software”:

- The system is running Solaris 2.6 or higher.
- OpenWindows Version 3.6 or higher has already been installed on the system.
- At least 2MB of disk space is available in `"/usr"` and `"/."`
- One or more of the cards listed in Section 3.1 are presently installed in the workstation.

NOTE: All device drivers are loadable. No kernel changes are required.

3.3 Installing Raptor GFX-C Driver Software

This section describes software installation from a CD-ROM.

3.3.1 CD-ROM Installation

The following are step-by-step instructions for installing the “Raptor GFX-C Driver Software” from a CD-ROM.

1. Install a Raptor GFX-C card in the computer as described in Chapter 2.

2. Boot the computer with the "-r" (reconfiguration) option. To do this on an Ultrasparc workstation, perform the following steps:
 - Power ON the computer.
 - Wait until you see boot messages displaying on the screen, then press and hold the `STOP` (L1) key, and then press the "A" key.
 - At the "ok" prompt, type `boot -r`.
3. Log in as `root`.
4. Insert the CD-ROM labeled "Raptor GFX-C Driver Software" into the drive.
5. If `/cdrom/cdrom0` exists, type:

```
prompt# cd /cdrom/cdrom0
```

Skip to step 6. Otherwise, mount the CD-ROM by typing the following:

```
prompt# mount -F hsfs -O -o ro  
/dev/dsk/c0t6d0s0 /cdrom
```

```
prompt# cd /cdrom
```
6. The CD-ROM contains an `install_all` script. To install the software, type:

```
prompt# ./install_all
```

This script will ask you a number of yes-or-no questions (generated by Sun's `pkgadd` install script). Answer these questions appropriately.
7. Reboot the system to complete the installation.

3.4 Changing Resolutions on Raptor GFX-C

After installation you may want to configure the X Window screen resolution, bit-depth, and refresh rate for your monitor. (This resolution is independent of the console resolution described in the Appendix A.) The default resolution is accepted by skipping this section. The default for the Raptor GFX-C is as follows:

Board	Resolution	Refresh	Bits/Pixels	Sync
GFX-C	Auto Detect	-	8+24	separate/composite

The `gfccconfig` utility can be used any time after installation to change these parameters.

NOTE: You must be `root` to execute this program.

Please see the man page on `gfccconfig` for a detailed description.

The next two sections describe two methods of using `gfccconfig` to configure the Raptor GFX-C card.

3.4.1 Interactive Configuration

`gfccconfig` has an interactive menu-style interface (See Figure 3.1). To use this program to configure your Raptor GFX-C card, type:

```
prompt# gfccconfig -i
```

NOTE: If X Windows is running on the Raptor GFX-C cards(s) to be configured, please exit out of it before running `gfccconfig`. Failure to do so could result in a corrupted screen for the remainder of the X Window session.

The Raptor GFX-C device(s) will be listed in the left column of the configuration screen displayed by `gfccconfig`. (See Figure 3.1) A description of the commands is as follows:

Chapter 3 – Software Installation

Up/Down Arrow	selects the desired graphics device to modify
Left/Right Arrow	selects the parameter to modify (e.g. resolution, bit-depth, or sync)
Space Bar	modifies the parameter for the selected graphics device (will bring up a menu when applicable)
`t`	puts a test pattern on the entire display (hit any key to return to the main screen)
`s`	saves current settings and exits
`h`	help
`q`	exits the program without saving any changes

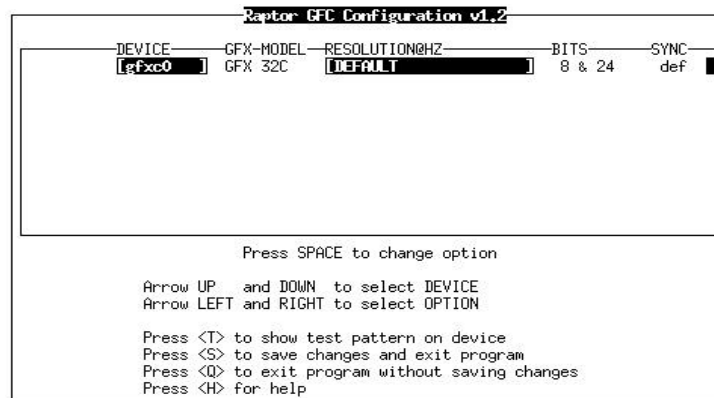


Figure 3.1 Raptor GFX-C Configuration

3.4.2 Non-Interactive Configuration

Sometimes it is convenient to configure the Raptor GFX-C card non-interactively. This method is especially useful when configuring many systems identically or when the appropriate configuration for the system is already known.

`gfcconfig` uses the same conventions as Sun's `m64config` or `ffbconfig` utilities. All of the parameters which are set using the interactive version can be set by specifying the option followed by a desired value. The parameters are:

<code>-dev <device></code>	selects the device to configure
<code>-res <resolution></code>	sets the resolution
<code>-res \?</code>	shows resolutions
<code>-file machine system</code>	specifies whether to modify <code>OWconfig</code> from <code>/etc/openwin/server/etc</code> or <code>/usr/openwin/server/etc</code>
<code>-depth 8 24</code>	changes the bit depth to 8 only or 8+24 mode
<code>-defaults</code>	resets device to default parameters
<code>-24only [true false]</code>	forces all windows to use 24-bit visuals. This will disable 8+24 mode and may prohibit some 8-bit applications from working

<code>-propt</code>	displays current settings
<code>-prconf</code>	displays hardware information
<code>-help</code>	shows usage
<code>-setbright</code>	sets the brightness of the 1600SW Digital Flat Panel monitor. The range of values is 0 to 64 with 0 being the brightest
<code>-getbright</code>	Gets the current brightness setting of the 1600SW Digital Flat Panel monitor

NOTE: By default the bit depth will be set to 8/24 for all resolutions. The GFX-FP card supports only 1600x1024@60 as its digital video output.

3.4.2.1 Examples

To configure the resolution on the Raptor GFX-C to 1152x900x66, type the following:

```
prompt# gfcconfig -res 1152x900x66
```

NOTE: If no device is specified, `gfcconfig` assumes that the GFX-C device is the console or the first available GFX-C device.

To verify the resolution prior to setting it permanently, add the word "try" after the resolution name. This option will display a test pattern on the screen until a return key is hit. Then the resolution can be accepted or rejected. For example:

```
prompt# gfcconfig -dev /dev/fbs/gfxc0
        -res 1152x900x66 try
```

To set the resolution to 1024x768x60 with a single TrueColor visual (no 8-bit PseudoColor visual):

```
prompt# gfcconfig -res 1024x768x60
        -24only true
```

To display the current settings for /dev/fbs/gfxc0:

```
prompt# gfcconfig -dev /dev/fbs/gfxc0 -propt
```

3.5 Setting Raptor GFX-C as the Console (Optional)

This section describes how to configure the Raptor GFX-C as the console device in your system.

NOTE: If the procedure for your system is not described below, please contact Tech Source, Inc..

3.5.1 Raptor GFX-C as the only framebuffer

3.5.1.1 Ultra 5 and Ultra 10

To use the Raptor GFX-C as the system console on an Ultra 5 or Ultra 10 as the only framebuffer, first disable the onboard card, which comes built into the Ultra 5 and Ultra 10. At the "ok" prompt, type:

```
ok setenv pcib-probe-list 1,3
ok reset
```

Once the system is reset, all console messages will be directed to the Raptor GFX-C card.

NOTE: To restore the motherboard's 8-bit graphics device as the console for any reason, simply add it back to the `pcib-probe-list` as below:

```
ok setenv pcib-probe-list 1,2,3
ok reset
```

3.5.1.2 Ultra 30, Ultra 60, Ultra 80 and other systems without any built-in frame buffers

If no other framebuffer is present in an Ultra 30, Ultra 60, Ultra 80 or another supported system, then the Raptor GFX-C will be the console by default, provided that the board is in a valid probed PCI slot.

3.5.2 Raptor GFX-C with a secondary framebuffer

The Raptor GFX-C can be made the console device when other secondary framebuffers are present in the system.

To configure the Raptor GFX-C card as the console when UPA or other framebuffers are in the system, the `output-device` variable in NVRAM must be changed to the actual path of the desired Raptor GFX-C cards. This path can best be determined by searching for the string "TSI" in the `/ tree` at the "ok" prompt.

For example, to find the PCI devices, at the "ok" prompt, type the following:

```
ok show-devs
```

You should see at least one entry containing the string "TSI", ie. "TSI,gfxc@#", where '#' will be a digit representing your Raptor GFX-C's slot location.

Use this entry as the console device for your desired Raptor

GFX-C. For example, if the path is `"/pci@1f,4000"` to the device `"TSI,gfxc@#"`, then type the following command:

NOTE: Replace ``#'` with whatever your Raptor GFX-C device requires.

```
ok setenv output-device /pci@1f,4000/TSI,gfxc@#
ok reset
```

Once the system is reset, all console messages will be directed to the Raptor GFX-C card.

NOTE: To restore the default graphics device as the console for any reason, simply set the `output-device` variable back to its default value of `screen` as below:

```
ok setenv output-device screen
ok reset
```

3.5.2.1 Other PCI framebuffer

To make the Raptor GFX-C the console device when other PCI framebuffers are present in the system, it may be necessary to change the `pcia-probe-list` to probe the Raptor GFX-C's slot before that of the secondary framebuffer (in addition to making the changes in 3.5.1.1., if applicable).

Determine the slot numbers that correspond to these framebuffers, then ensure that the Raptor GFX-C slot number precedes that of the secondary framebuffer in the `pcia-probe-list`.

For example, if the Raptor GFX-C is located in slot 3, and the secondary framebuffer is located in slot 1, then update the `pcia-probe-list` so that slot 3 is probed BEFORE slot 1. A possible configuration may resemble the following:

```
ok setenv pcia-probe-list 3,2,1,4  
ok reset
```

Once the system is reset, all console messages will be directed to the Raptor GFX-C card.

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Chapter 4

OPENWINDOWS

4.1 Overview

This section describes how to start up OpenWindows on the Raptor GFX-C cards. The Raptor GFX-C device name will be `gfxc#`, where '#' represents an assigned PCI slot number.

4.1.1 Raptor GFX-C as the console

If the Raptor GFX-C is the console, type:

```
prompt# openwin
```

4.1.2 Raptor GFX-C as the secondary framebuffer

If the PGX card is the console and the GFX-C is the second card, to start OpenWindows on both cards, in multiscreen mode, type:

```
prompt# openwin -dev /dev/fbs/m640 \  
              -dev /dev/fbs/gfxc0
```

The order of the devices corresponds to the order of the screens.

<p>NOTE: In the above example, the <code>gfxc</code> device number is 0. This may be different in your configuration. Please check in <code>/dev/fbs/</code> or <code>dmesg</code> for correct device numbers.</p>

4.2 Common Desktop Environment (CDE)

If you have installed CDE and would like CDE to appear on the Raptor GFX-C display, you may need to modify your `/etc/dt/config/Xservers` file.

If the file `/etc/dt/config/Xservers` does not exist, please copy it from the `/usr/dt/config` directory. Type:

```
prompt# cp /usr/dt/config/Xservers \
        /etc/dt/config
```

If the directory does not exist, type:

```
prompt# mkdir /etc/dt/config
prompt# cp /usr/dt/config/Xservers \
        /etc/dt/config
```

If the Raptor GFX-C card is the console device, then there is no need to modify the `Xservers` file.

The sample `Xservers.gfc` file which is provided, assumes that the Raptor GFX-C is the only framebuffer on which to start CDE:

```
:0 Local local_uid@console root \
/usr/openwin/bin/Xsun :0 -dev \
/dev/fbs/gfxc0 -nobanner
```

NOTE: If for some reason the name of your Raptor *GFX-C* device is something other than `gfxc0`, please substitute the correct name in the file.

You may add any other desired command line arguments to the end of this line.

For example, you may start CDE on multiple displays. To do this, list each display device following the convention above. The following configuration displays CDE on the display named `/dev/fbs/gfxc0` and uses the device named `/dev/fbs/m640` (the built in graphics device on Sun Ultra 5/10 systems) as a secondary framebuffer:

```
:0 Local local_uid@console root \
/usr/openwin/bin/Xsun :0 -dev /dev/fbs/gfxc0 \
-dev /dev/fbs/m640
```

Chapter 5

ADVANCED FEATURES

5.1 Overview

The Raptor GFX-C has several advanced features available through the X Server. They are:

- 8/24-bit simultaneous visuals
- Off-screen pixmap caching
- OpenGL support

5.2 8/24 Simultaneous Visuals

The 8/24 mode supports 8 and 24-bit visuals simultaneously. This addresses the classic colormap flashing issue with a 24-bit visual while providing the 8-bit visual that is required by some legacy applications, such as SoftWindows.

The available visuals are PseudoColor and TrueColor. PseudoColor is the default visual.

5.3 Cached Pixmap

All Raptor GFX-C cards support off-screen pixmap caching. Cached pixmaps are those which are stored in the off-screen memory. These off-screen pixmaps allow faster transfer rates to and from on-screen windows. The default minimum size of pixmaps allocated in this manner is 4096 pixels (width x height).

The available off-screen memory depends on the amount of video memory, the current resolution, and depth settings. For example, consider the Raptor GFX-32C card, which has 32MB of video memory. If it is running at 1024x768 resolution with a

depth of 8-bits, 768K is used for on-screen memory. That leaves 31.2MB available for pixmaps. In 24-bit mode, the on-screen memory that is used is 4 times larger than what is used in the 8-bit mode.

The largest pixmaps are stored in off-screen memory. If a larger pixmap replaces a smaller pixmap in the off-screen memory, the smaller pixmap will move to system memory and remain there even after the larger pixmap is destroyed.

5.4 OpenGL Support

OpenGL support is provided through the Direct Pixel Access (DPA) Extension. To use this function, OpenGL v1.1.1 or higher must be already installed on your system.

<p>NOTE: In OpenGL v1.1.1 for Solaris, there is a bug in the DPA PCI 24-bit support that causes the red and blue colors to be swapped. There is a patch from Sun (Patch ID 106022-07) that fixes this problem. It is fixed in OpenGL v1.1.2.</p>

Chapter 6

REMOVING Raptor GFX-C SOFTWARE

6.1 Overview

To find out if any “Raptor GFX-C software” exists on your system, type:

```
prompt# pkginfo | grep TSigfc
```

If you see any response to the command, then you have some existing “Raptor GFX-C software” which needs to be removed.

To uninstall the “Raptor GFX-C software”, enter the following command:

For Solaris 2.6, type:

```
prompt# pkgrm TSigfcw TSigfcmn TSigfc
```

For Solaris 7 and Solaris 8, type:

```
prompt# pkgrm TSigfcw TSigfcmn TSigfc TSigfcx
```

<p>Warning: This uninstall procedure may not work with older versions of the TSI software. It is important to use the procedure provided with the previous version.</p>
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Chapter 7

TECHNICAL ASSISTANCE

7.1 Who to Call for Help

If you need help, please call our Technical Support Team at (800) 330-8301, or directly at (407) 262-7100 between the hours of 8:30am and 5:30pm EST.

Please have the software part number, version, and serial number for your Raptor GFX-C card(s) available when contacting Tech Source, Inc. in order to expedite support.

NOTE: Technical Assistance will be available only for products under standard or extended warranty.
--

7.2 Email Address

Our email address is hotline@techsource.com. International customers should use email or our fax line at (407) 339-2554.

7.3 Website

Detailed product information, FAQ's, bug lists, and patches are available on our website located at:

<http://www.techsource.com>

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Appendix A

CHANGING THE CONSOLE RESOLUTION

A.1 Overview

The Raptor GFX-C card can be configured to be the console in the UltraSparc workstation. Every Raptor GFX-C card type has its own default console resolution and default depth as shown in the following table:

Board	Resolution	Refresh	Bits/Pixels	Sync
GFX-C	Auto Detect	-	8+24	separate/composite

It is possible to change the console resolution on all Raptor GFX-C cards. The procedures described in this appendix are:

- EDID Auto-Detect feature
- Output Device Method
- Video-Mode Method
- Video-Timing Method

This appendix includes a troubleshooting section describing possible problems and answers associated with changing the console resolution.

A.1.1 Reason for changing the console resolution

Normally the default console resolution is sufficient for most users. An example of when you might be required to change the default resolution is described below:

- If the monitor does not "sync up" at the default console resolution, it may be necessary to choose a different console resolution.

A.1.2 Guidelines for changing the console resolution

There are some general guidelines to follow when changing the default console resolutions. They are as follows:

- By default, console resolutions 1600x1280 and lower will automatically be set to 24-bit mode. Higher resolutions will default to 8-bit mode.
- It is recommended that you use `gfccnfig -i` to test a resolution before configuring the console to that resolution.

A.1.3 EDID Auto-Detect feature

If you are using a monitor with DDC2B/EDID protocol the default resolution will be determined using the Auto-Detect feature.

With this protocol, the GFX-C card first checks the Standard Timing Identifiers (taking the first one supported) then tries to match the Established Timings.

NOTE: The monitor must be turned ON prior to booting the system in order for the Raptor GFX-C to communicate with it. Some adapters and cables may block this signal.
--

If the Auto-Detect feature fails the card will default to 1152x900x66.

Other methods described in this appendix will override any information obtained via EDID.

A.2 Output-Device Method

To specify the console resolution of a Raptor GFX-C card via the `output-device` environment variable, use the format `screen:rAxBxC` where:

Appendix A – Changing the Console Resolution

A is the desired horizontal resolution,
B is the desired vertical resolution,
C is the desired refresh rate.

The system will check these values against an internal list of resolutions (see section A.3 for valid list) and use the corresponding entry as the console resolution.

For example, to use VESA 1024x768x75 as the console resolution, type the following at the ok prompt:

```
ok setenv output-device screen:r1024x768x75  
ok reset
```

NOTE: The new console resolution will take effect following the reset, and will hold the resolution information until the `output-device` variable is changed manually.

A.3 Video-Mode Method

At the "ok" prompt in Boot PROM mode, the console resolution can be easily set on Raptor GFX-C cards by using one of the 39 preinstalled resolution modes. These resolution settings are identified by video modes 0-38.

NOTE: The default console of all video modes is 24 bits.

0	640x480@60
1	640x480@72
2	640x480@75
3	640x480@85
4	800x600@60
5	800x600@72
6	800x600@75
7	800x600@85
8	1024x768@60
9	1024x768@70

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10	1024x768@75
11	1024x768@77 *
12	1024x768@76
13	1024x800@85 *
14	1152x900@60
15	1152x900@66 *
16	1152x900@70
17	1152x900@75
18	1152x900@76 *
19	1152x900@85
20	1280x800@76 *
21	1280x1024@60
22	1280x1024@67 *
23	1280x1024@75
24	1280x1024@76 *
25	1280x1024@85
26	1600x1000@66 *
27	1600x1000@76 *
28	1600x1024@60 (FP)
29	1600x1200@60
30	1600x1200@65
31	1600x1200@70
32	1600x1200@75
33	1600x1200@85
34	1600x1280@76*
35	1920X1080X60
36	1920X1080X72*
37	1920X1080X80
38	1920X1200X60

NOTE: The resolution followed by an * uses composite sync.

NOTE: Please refer to Appendix C for a description of `nvedit` commands.

```
ok nvedit
  0: 8 value video-mode
  1: <ctrl-c>
ok nvstore
ok setenv use-nvramrc? true
ok reset
```

NOTE: The last three commands enable the NVRAM. Without these lines, the changes you make with `nvedit` will be ignored.

A.4 Video-Timing Method

If all of the previously described methods fail for your configuration, it is possible to specify the exact timing numbers for a particular resolution. The last method for setting the console resolution also uses `nvedit`. This method is more involved and requires knowledge of all timing parameters for the desired resolution, and is only meant for monitors whose resolutions are not available in the `video-mode` method. Please refer to Appendix C for detailed instructions on using `nvedit`.

NOTE: The video-timing method should be used **only** if the previous methods have been unsuccessful.

For example, to set the console resolution to 1280x1024@76Hz, type the following:

```
ok nvedit
  0: : video-timing " 1280, 384, 32, 64,
      1024, 43, 3, 8, 135000000, 0" ;
  1: <ctrl-c>
ok nvstore
ok setenv use-nvramrc? true
ok reset
```

NOTE: The syntax is very important. The spaces must be present exactly as they appear in the example.

NOTE: The last three commands enable the NVRAM. Without these lines, the changes you make with `nvedit` will be ignored.

The following is a brief description of the 10 parameters used in this method.

- horizontal resolution (in pixels)
- horizontal blanking total
- horizontal front porch
- horizontal sync width
- vertical resolution (in lines)
- vertical blanking total
- vertical front porch
- vertical sync width
- dotclock in Hz
- sync value:

0	separate sync
256	sync on green
512	positive vertical sync pulse
1024	positive horizontal sync pulse
2048	composite sync

The sync values can be added together to select more than one of the above.

NOTE: To obtain the timing parameters required to use the video-timing method, please contact Tech Source, Inc. with your monitor's requirements.

A.5 Troubleshooting

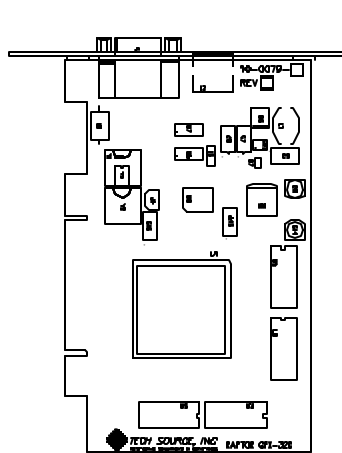
Problem	Solution
Used the method described in the Appendix to configure the console resolution, but the card still defaults to something other than the resolution specified.	<p>A priority scheme is used to determine the boot console resolution. The GFX-C firmware checks the various methods in the order of priority discussed below. If it finds the resolution from the current method, it uses it; otherwise, it goes down the priority list to find the resolution information. Finally, if there is no resolution information, it uses the default resolution. The resolution-setting methods are enumerated in order of decreasing priority:</p> <ol style="list-style-type: none">1. <code>output-device</code> method (Section A.2)2. <code>video-timing</code> method (Section A.4)3. <code>video-mode</code> method (Section A.3)4. DDC2B/EDID (Section A.1.3)5. Default resolution for the card

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Appendix B

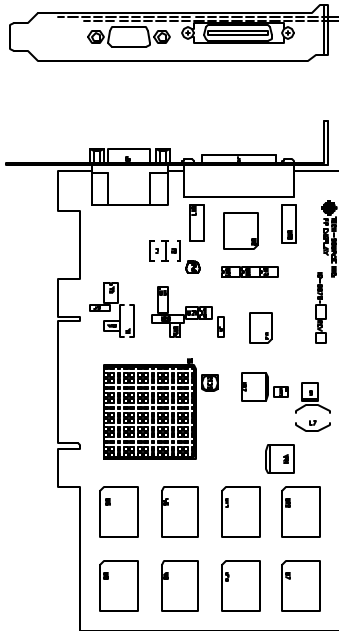
CARD SPECIFICATIONS

B.1 Raptor GFX-32C PCI Card and Specifications



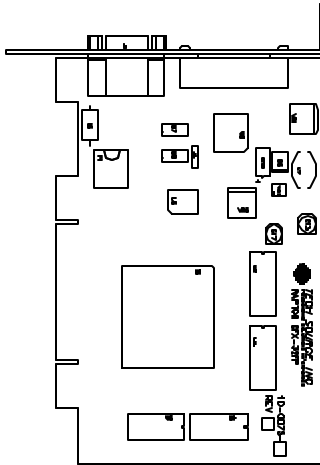
Frame Buffer:	32 Megabytes SDRAM
Hardware Cursor:	3 color, 64 x 64 bitmap
Horizontal Sync Signals	31.5kHz – 110kHz
Vertical Refresh Rates	60Hz – 200Hz
Dot Clock Maximum	270MHz
PCI Interface:	66/33 MHz, 32-bit
Video Interface:	Analog RS-343 (75 ohm)
Video Sync:	Separate and Composite
Video Connector:	Standard 15 pin D-shell (VGA)
Temperature Rating:	0° to 60°C operating -40° to 75°C non-operating
Humidity Rating:	10 to 95% (non-condensing)
Power Rating:	+5V @ 3 Amps (max)
PCB Dimensions:	140mm x 89mm (5.5" x 3.5")
Boot Support OBP	IEEE 1275 Compliant FCode

B.2 Raptor GFX-FP PCI Card and Specifications



Frame Buffer:	16 Megabytes SGRAM
Hardware Cursor:	3 color, 64 x 64 bitmap
Horizontal Sync Signals	31.5kHz – 100kHz
Vertical Refresh Rates	60Hz – 200Hz
Dot Clock Maximum	270MHz
PCI Interface:	66/33 MHz, 32-bit
Video Interface:	LVDS Digital FP Interface Analog RS-343 (75 ohm)
Video Sync:	Separate and Composite
Video Connectors:	36 pin D ribbon AND Standard 15 pin D-shell (VGA)
Temperature Rating:	15 ^o to 50 ^o C operating -40 ^o to 70 ^o C non-operating
Humidity Rating:	10 to 95% (non-condensing)
Power Rating:	+5V @ 3 Amps (max)
PCB Dimensions:	178mm x 107mm (6.875" x 4.2")
Boot Support OBP	IEEE 1275 Compliant FCode

B.3 Raptor GFX-FP PCI Card and Specifications (32MB Version)



Frame Buffer:	32 Megabytes SDRAM
Hardware Cursor:	3 color, 64 x 64 bitmap
Horizontal Sync Signals:	31.5kHz – 100kHz
Vertical Refresh Rates:	60Hz – 200Hz
Dot Clock Maximum:	270MHz
PCI Interface:	66/33 MHz, 32-bit
Video Interface:	LVDS Digital FP Interface Analog RS-343 (75 ohm)
Video Sync:	Separate and Composite
Video Connectors:	36 pin D ribbon AND Standard 15 pin D-shell (VGA)
Temperature Rating:	15 ^o to 50 ^o C operating -40 ^o to 70 ^o C non-operating
Humidity Rating:	10 to 95% (non-condensing)
Power Rating:	+5V @ 3 Amps (max)
PCB Dimensions:	140mm x 90mm (5.5" x 3.5")
Boot Support OBP:	IEEE 1275 Compliant FCode

B.4 Special Adapter for Sun Monitors

The Raptor GFX-C series cards have a VGA connector for video output. This works with all PC monitors and most new Sun monitors. Some Sun monitors require the 13W3 connector. A 13W3-to-VGA adapter to support these monitors is available from Tech Source, Inc.

Appendix C

USING NVEDIT TO MODIFY NVRAM

C.1 NVRAM Edit Commands

This section discusses the use of NVRAM. The NVRAM is used for setting resolution in the Video-Mode and Video-Timing methods. To edit the NVRAM, begin `nvedit` at the `ok` prompt. There are several commands that you must use to edit the variables in NVRAM:

<Backspace>	deletes the character preceding the cursor
<Ctrl-l>	lists NVRAM current values
<Ctrl-p>	moves to the previous line
<Ctrl-n>	moves to the next line
<Ctrl-b>	moves to the previous character
<Ctrl-f>	moves to the next character
<Ctrl-u>	deletes to the beginning of the line
<Ctrl-k>	joins the current and next line
<Ctrl-u><Ctrl-k>	deletes the current line
<Ctrl-c>	exits the NVRAM editor (back to the <code>ok</code> prompt)

The changes will only take effect if they are stored using the **`nvstore`** command entered at the `ok` prompt. Once the changes are stored, the NVRAM must be enabled before the system will execute it. This is done by setting the environment variable `use-nvramrc?` to `true`. Please reset the system to make the changes effective.

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