



# Release 177 Graphics Drivers ***Release Notes***

**Version 177.79**

**For Windows Vista 32-bit  
and Windows Vista 64-bit**

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## CHAPTER

## 1

# INTRODUCTION TO *RELEASE NOTES*

This edition of *Release Notes* describes the Release 177 ForceWare Graphics Drivers for Microsoft® Windows® Vista. NVIDIA provides these notes to describe performance improvements and bug fixes in each documented version of the driver.

## Structure of the Document

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This document is organized in the following sections:

- “[Release 177 Driver Changes](#)” on page 3 gives a summary of changes, and fixed and open issues in this version.
- “[The Release 177 Driver](#)” on page 19 describes the NVIDIA products and languages supported by this driver, the system requirements, and how to install the driver.
- “[Mode Support for Windows](#)” on page 23 lists the default resolutions supported by the driver.

## Changes in this Edition

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This edition of the *Release Notes* for Windows Vista includes information about NVIDIA ForceWare graphics driver version 177.79, and lists changes made to the driver since version 175.19. These changes are discussed beginning with the chapter “[Release 177 Driver Changes](#)” on page 3.



## CHAPTER

## 2

# RELEASE 177 DRIVER CHANGES

This chapter describes open issues for version 177.79, and resolved issues and driver enhancements for versions of the Release 177 driver up to version 177.79. The chapter contains these sections:

- “Version 177.79 Highlights” on page 4
- “Changes in Version 177.79” on page 7
- “Changes in Version 177.39” on page 9
- “Open Issues in Version 177.79” on page 10
- “Not NVIDIA Issues” on page 12
- “Known Product Limitations” on page 18

## Version 177.79 Highlights

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This section provides highlights of version 177.79 of the NVIDIA Release 177 Driver for Windows Vista.

- [What's New in Release 177](#)
- [What's New in Version 177.79](#)
- [Limitations in This Release](#)

### What's New in Release 177

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- Added support for the following NVIDIA products:
  - GeForce GTX 280
  - GeForce GTX 260
  - GeForce 9500 GT
  - GeForce 9800 GT
  - nForce 780a SLI
  - nForce 750a SLI
- Added support for hot-plug detection of VGA displays that provide EDID information.
- Added support for DDC-Ci/MCCS over the DisplayPort AUX channel.
- Added the NVIDIA Control Panel option to expose only consumer electronics (CE) resolutions for HDMI inputs.

## **What's New in Version 177.79**

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- Added support for the GeForce 9500 GT and GeForce 9800 GT
- See [“Changes in Version 177.39”](#) on page 9 for a list of resolved issues.

## Limitations in This Release

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The following are features that are not currently supported or have limited support in this driver release:

- **NVIDIA SLI Antialiasing**
- **NVIDIA SLI Mode for GeForce 6800 Ultra and GeForce 6800 GT**
- **INF Support for Restricted Timings**

This driver version does not support the use of Restricted Timing settings (R&T strings) in the INF to control mode validation and/or mode setting for custom mode/adaptor/monitor combinations. This capability is planned for a later driver release.

## NVIDIA Control Panel features that are Not Yet Available

Support for the following control panel features is under development and not yet available under Windows Vista:

- **Display Category**
  - The Graph tab on the Adjust Desktop Color Settings page is not available.

## Changes in Version 177.79

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The following sections list the changes made and issues resolved since driver version 177.39 and 175.19.

- “Fixed Issues–Windows Vista 32-bit” on page 7
- “Fixed Issues–Windows Vista 64-bit” on page 7

The NVIDIA bug number and driver module are provided for reference.

### Fixed Issues–Windows Vista 32-bit

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#### Single- GPU Issues

- GeForce GTX 280/260: Call of Duty 4 and Counterstrike–hitching occurs in the game. [439993]
- GeForce 9800 GX2: Civilization 4–white flickering occurs on the map after zooming out at high resolutions and with antialiasing enabled. [391640]
- GeForce 9800 GX2, GeForce 8800 GTX: With multiple displays connected, the NVIDIA Control Panel crashes when loading any saved profile after switching single display modes to another display. [401488]
- [SLI], GeForce 9600 GT: PT Boats: Knights of the Sea (DirectX 10) - there is texture corruption at 1600x1200 resolution and 8xAA. [374320]

#### Multi- GPU Issues

- [SLI], GeForce 9600 GT, GeForce 8600 GTS: Crysis–the sky becomes corrupted after changing the resolution while playing the game with SLI mode enabled. [385470]  
*NVIDIA recommends that you save and then exit the game before changing the resolution.*
- [SLI], GeForce 9600 GT, GeForce 6600: Prey– the SLI visual indicator does not appear when viewing SLI load balancing even though SLI mode is enabled and active. [379824]

### Fixed Issues–Windows Vista 64-bit

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#### Single- GPU Issues

- GeForce 9800 GX2: Civilization 4–white flickering occurs on the map after zooming out at high resolutions and with antialiasing enabled. [391640]

## Multi- GPU Issues

- [SLI], GeForce GTX 280/260: Medusa demo (DirectX 10) - the demo flickers when the character starts turning into stone, during the glow effect. [434883]
- [Quad SLI], GeForce 9800 GX2: Painkiller:Overdose—the game slows down periodically when Quad SLI is enabled. [396665]
- [Quad SLI], GeForce 9800 GX2: Repeatedly enabling/disabling SLI may cause the desktop to corrupt. [408652]
- [SLI], GeForce 9600 GT, GeForce 8600 GTS: Crysis - the sky becomes corrupted after changing resolution with SLI mode enabled. [385470]

*NVIDIA recommends that you save and then exit the game before changing the resolution.*

- [SLI], GeForce 9600 GT, GeForce 6600: Prey - the SLI visual indicator does not appear when viewing SLI load balancing even though SLI mode is enabled and active. [379824]

## Changes in Version 177.39

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The following sections list the changes made and issues resolved since driver version 177.35.

- “Fixed Issues–Windows Vista 64-bit” on page 9

The NVIDIA bug number and driver module are provided for reference.

### Fixed Issues–Windows Vista 64-bit

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#### Multi- GPU Issues

- [SLI]: Program settings cannot be applied for a newly added SLI profile if the profile duplicates an existing one. [393649]

## Open Issues in Version 177.79

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As with every released driver, version 177.79 of the Release 177 driver has open issues and enhancement requests associated with it. This section includes lists of issues that are either not fixed or not implemented in this version. Some problems listed may not have been thoroughly investigated and, in fact, may not be NVIDIA issues. Others may have workaround solutions.

- [“Windows Vista 32-bit Issues”](#) on page 10
- [“Windows Vista 64-bit Issues”](#) on page 11

### Windows Vista 32-bit Issues

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#### Single GPU Issues

##### All GPUs

- NVIDIA Control Panel: Adding a custom profile with an open bracket in the name results in an error. [437056]
- Counter Strike—the application crashes to the desktop if the resolution or bit-depth is changed from the in-game video options menu.

*The problem does not occur if you change the resolution or bit-depth from the game’s main menu and not while in a game.*

##### GeForce 9 Series

- GeForce 9 Series: Changes to the NVIDIA Control Panel “Change flat panel scaling” option are not applied with DVI+HDTV connected in Clone mode. [439308]
- GeForce 9800 GTX: City of Heroes—only a quarter of the screen is visible when launching the game. [448143]
- GeForce 9800 GTX: HellGate: London (DirectX 10)—textures for the character and objects disappear at high settings. [446424]
- GeForce 9800 GTX: Flight Simulator Acceleration (DirectX 10) - the sky box does not render correctly when zoomed all the way out. [436158]
- GeForce 9800 GTX: Flight Simulator Acceleration (DirectX 10) - there is no antialiasing preview window. [436156]

#### Multi-GPU Issues

- [3-way SLI], GeForce 9800 GTX/nForce 750/780a SLI: Portal –there are white lines at the borders of the textures when the game is launched with default settings. [441377]

- [SLI], GeForce 9800 GTX: Mass Effect—there is a band of corruption on the edge of the screen when switching from a high resolution to a lower resolution. [433929]
- [Quad SLI], GeForce 9800 GX2: Test Driver Unlimited—there is pausing/hitching during the cut scene transitions. [395207]

## Windows Vista 64-bit Issues

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### Single GPU Issues

#### GeForce 200 Series

- GeForce GTX 280/260: Half Life 2: Episode 2—in-game brightness is greatly reduced if Enhanced or Override AA is enabled from the NVIDIA Control Panel. [429254]

#### GeForce 9 Series

- GeForce 9800 GTX: City of Heroes—only a quarter of the screen is visible when launching the game. [448143]
- GeForce 9800 GTX: Flight Simulator Acceleration (DirectX 10) - the sky box does not render correctly when zoomed all the way out. [436158]
- GeForce 9800 GTX: Flight Simulator Acceleration (DirectX 10) - there is no antialiasing preview window. [436156]

### Multi-GPU Issues

#### GeForce 200 Series

- [Hybrid SLI], GeForce GTX 260/280+nForce 760/780a SLI: Fraps does not run if set to run at Windows launch in Hybrid SLI performance or save power modes. [443794]

#### GeForce 9 Series

- [3-way SLI], GeForce 9800 GTX: Crysis (64-bit)(DirectX 9)— there is a lengthy pause or the system freezes when firing a weapon.

*This issue does not occur with the DirectX 10 version of the game, and is recommended.*

- [SLI], GeForce 9600 GT: Pacific Fighters—the application crashes while changing any 16-bit color depth resolution to a 32-bit color depth resolution. [444897]
- [Quad SLI], GeForce 9800 GTX: Vanguard—there is texture corruption in the water when Rendering Quality is set to High performance. [441690]
- [SLI]: Program settings cannot be applied for a newly added SLI profile if the profile duplicates an existing one. [393649]
- [Quad SLI], GeForce 9800 GX2: Test Driver Unlimited—there is pausing/hitching during the cut scene transitions. [395207]

## Not NVIDIA Issues

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This section lists issues that are not due to the NVIDIA driver as well as features that are not meant to be supported by the NVIDIA driver for Windows Vista.

- “Windows Vista Limitations” on page 12
- “Unsupported Features” on page 13
- “OpenGL Application Issues” on page 15
- “Application Issues” on page 16
- “Operating System Issues” on page 17

## Windows Vista Limitations

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These are behaviors that may be different from Windows XP and are related directly to the Windows Vista operating system.

- **NVIDIA TurboCache**

Windows Vista now controls the allocation of system memory to the GPU for TurboCache functions. The Windows Vista Display Properties pages show the shared system memory (SSM), or how much memory is allocated for NVIDIA GPUs to use for TurboCache.

For more information on graphics memory reporting under Windows Vista, visit <http://www.microsoft.com/whdc/device/display/graphicsmemory.mspx>.

## Unsupported Features

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The following are features and functionality that were available in driver releases supporting Windows XP, but are not—and will not be—available in driver releases for Windows Vista:

- **High resolution scaling desktop (HRSD)**
- **MultiView Display Mode** (for NVIDIA Quadro NVS graphics cards)
- **NVKeystone**
- **Unified back buffer (UBB) controls**
- **OpenGL Video Overlays**

This is an operating system limitation.

Vista window manager features will provide new ways of accomplishing overlays, but will require application porting.

- **Overclocking**

GPU overclocking is no longer supported in the default GPU driver control panel. This feature is available in the NVIDIA System Tools software, which you can download from [NVIDIA.com](http://NVIDIA.com).

- **GPU Temperature Monitoring**

Temperature monitoring is no longer supported in the default GPU driver control panel. This feature is available in the NVIDIA System Tools software, which you can download from [NVIDIA.com](http://NVIDIA.com).

- **AGP Settings Adjustment**
- **Full-screen Video Mirror**
- **Video Zoom**

- **Pan & Scan** - the process of panning across the desktop in order to display a desktop on a monitor with lower resolution

- **Per-display Desktop Color Setting Adjustments**

For Clone mode, the desktop color setting adjustments through the NVIDIA Control Panel can only be made across all displays in a system, and not on a per-display basis.

- **Per-display Video Color Setting Adjustments**

For Dualview mode, the video color setting adjustments through the NVIDIA Control Panel can only be made across all displays in a system, and not on a per-display basis.

- **Edge Blending**
- **Run display optimization wizard**

- **Run multiple display wizard**
- **Run television setup wizard**
- **nView Horizontal and Vertical Span Modes**

Due to architectural changes in the new Windows Vista Window Display Driver Model (WDDM), span mode cannot be supported in NVIDIA graphics drivers. NVIDIA recommends using the built-in Windows Vista multi-display modes.

- **Display/Connection Wizard** (such as was provided with Windows Media Center Edition)
- **DVD/MPEG Extensions** (such as was provided with Windows Media Center Edition)
- **Audio Extensions** (such as was provided with Windows Media Center Edition)
- **Windowed quad-buffered stereo**

This is an operating system limitation.

- **NVIDIA nView Desktop Manager**

The nView Desktop Manager will not be included in drivers for GeForce products.

## OpenGL Application Issues

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The following are known compatibility issues for OpenGL applications developed under Windows XP:

- Mixed GDI and OpenGL rendering does not work.

A number of applications use GDI to render UI components and object highlighting. This is not supported in the Windows Vista driver model.

NVIDIA recommends converting GDI rendering to OpenGL.

The following are some applications that are known to have this issue:

- Maya 7.01
- OneSpace Designer Modeling
- Applications, Tools, and Benchmarks not Supported Under Windows Vista
  - GLperf
  - 3ds max 8 (later releases may be supported)
  - CATIA V5R15 (V5R16 is supported)
  - PTC's CDRS 2001
- Front buffered rendering may be slow, especially when DWM is enabled.

Flushing the rendering queue while rendering to the front buffer may cause the window manager to recomposite. Applications should therefore minimize the frequency with which they flush the rendering queue.

## Application Issues

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- Star Wars: Knights Of The Old Republic 2—the game fails to launch, and an “application has stopped working” error message appears. [420115]  
*This occurs because the application is not able to interpret the driver version correctly.*
- Tiger Woods PGA Tour 2007—Fly-by shot before each hole blacks-out textures. [274697]  
*NVIDIA is working with the developer to resolve this issue.*
- City of Heroes—The mouse cursor does not display. [259256]  
*This is an application issue that can be worked around in full-screen mode by adding “compatiblecursors 1” to the City of Heroes desktop shortcut.  
NVIDIA is pursuing a fix with the application developer.*
- Sims 2—“Smooth Edges (AA)” option is not available with Release 100 drivers. [272477]  
*This occurs because of an incorrect driver version check in the application.  
NVIDIA has worked around this issue in the operating system by changing the way the driver version is reported to this application.*
- Warhammer 40k Dawn of War (all versions) does not run with Release 100 drivers. [273154]  
*This occurs because of an incorrect driver version check in the application.  
NVIDIA has worked around this issue in the operating system by changing the way the driver version is reported to this application.*
- Need for Speed Carbon—After upgrading with patch 1.3, the game crashes when launched. [290506]  
*This is an issue with the application patch under Windows Vista.*
- Nascar Simracing—the game crashes when launched. [270792]  
*This is an issue with the application under Windows Vista.*
- Call of Duty 2—Only solid colors render during game play when 4xAA is enabled. [257454]  
*The application is not applying antialiasing properly. Please try selecting 2x AA, disabling antialiasing, or using NVIDIA Enhanced application or Override antialiasing modes.  
NVIDIA is pursuing a fix with the application developer*
- Age of Empires III—the game has rendering artifacts, such as textured squares for smoke. [258036]
- Flight Simulator X—pressing Alt+Tab to switch to the desktop does not work. [293729]

- Everquest 2– with NVIDIA driver versions 100.xx, the following error message appears: [273346]

"You currently have a (7.15.11.120) video card installed. We recommend that you download version 7772 drivers before playing Everquest."

*This occurs because the application is not checking the driver version correctly, but this does not affect game play. Please select "Continue Anyway" to launch the game. The problem does not occur with a previous Release 95 driver (xx.xx format).*

*NVIDIA is pursuing a fix with the application developer.*

## **Application Issues Under SLI Mode**

- [SLI]: NVIDIA SLI scaling on some applications under Windows Vista may not be as much as under Windows XP. Some applications include "S.T.A.L.K.E.R., Half-Life 2: Lost Coast, Company of Heroes, Battlefield 2142, Call of Duty 2, Hitman: Blood Money, and Far Cry. [302534 290803]

*This is an application issue which has been resolved with the latest Steam patch.*

## **Operating System Issues**

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- World of Warcraft – there is a 60% drop in performance when running the game in windowed mode with SLI or multi-GPU mode enabled. [289427]

*This is due to a limitation of the Windows Vista operating system and affects all multi-GPU systems. NVIDIA is investigating a workaround for this performance problem.*

## Known Product Limitations

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This section describes problems that will not be fixed. Usually, the source of the problem is beyond the control of NVIDIA. Following is the list of problems and where they are discussed in this document:

- “Image Sharpening Control not Available with GeForce 8 Series and later GPUs” on page 18
- “Gigabyte GA-6BX Motherboard” on page 18

### Image Sharpening Control not Available with GeForce 8 Series and later GPUs

---

With GeForce 8 Series and later graphics cards, the **Image sharpening** slider on the NVIDIA Control Panel->Display->Adjust Desktop Color Settings page is grayed out.

This control is intentionally disabled because image sharpening is not supported on GeForce 8 series and later GPUs.

### Gigabyte GA-6BX Motherboard

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This motherboard uses a Linfinity regulator on the 3.3-V rail that is rated to only 5 A—less than the AGP specification, which requires 6 A. When diagnostics or applications are running, the temperature of the regulator rises, causing the voltage to the NVIDIA chip to drop as low as 2.2 V. Under these circumstances, the regulator cannot supply the current on the 3.3-V rail that the NVIDIA chip requires.

This problem does not occur when the graphics board has a switching regulator or when an external power supply is connected to the 3.3-V rail.

## CHAPTER

## 3

# THE RELEASE 177 DRIVER

This chapter covers the following main topics:

- “Hardware and Software Support” on page 19
- “Driver Installation” on page 21
- “NVIDIA Driver History” on page 22

## Hardware and Software Support

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### Supported Operating Systems

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The Release 177 driver, version 177.79, has been tested with Microsoft Windows® Vista RTM OS builds version 6000 or higher, and supports both 32-bit and 64-bit versions of Windows Vista Editions:

- Windows Vista Home Basic
- Windows Vista Home Premium
- Windows Vista Business
- Windows Vista Enterprise Edition
- Windows Vista Ultimate

## Supported NVIDIA Products

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Table 3.1 lists the NVIDIA products supported by the Release 177 driver, version 177.79

**Table 3.1** Supported NVIDIA Products

### Consumer Products

GeForce GTX 280  
 GeForce GTX 260  
 GeForce 9800 GX2  
 GeForce 9800 GTX  
 GeForce 9800 GT  
 GeForce 9600 GT  
 GeForce 9600 GSO  
 GeForce 9500 GT  
 nForce 780a SLI  
 nForce 750a SLI

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## Supported Languages

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The Release 177 Graphics Drivers supports the following languages in the main driver Control Panel:

|                       |                     |                           |
|-----------------------|---------------------|---------------------------|
| English (USA)         | German              | Portuguese (Euro/Iberian) |
| English (UK)          | Greek               | Russian                   |
| Arabic                | Hebrew              | Slovak                    |
| Chinese (Simplified)  | Hungarian           | Slovenian                 |
| Chinese (Traditional) | Italian             | Spanish                   |
| Czech                 | Japanese            | Spanish (Latin America)   |
| Danish                | Korean              | Swedish                   |
| Dutch                 | Norwegian           | Thai                      |
| Finnish               | Polish              | Turkish                   |
| French                | Portuguese (Brazil) |                           |

# Driver Installation

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## Minimum Hard Disk Space

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The hard disk space requirement is minimum 38.2 MB for English-only, and 66.4 MB for International.

## Before You Begin

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If you have previously installed NVIDIA nTune, NVIDIA recommends that you uninstall nTune before installing this driver. After the driver install is complete, you can reinstall NVIDIA nTune.

## Installation Instructions

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- 1 Follow the instructions on the NVIDIA .com Web site driver download page to locate the appropriate driver to download, based on your hardware and operating system.
- 2 Click the driver download link.
- 3 The license agreement dialog box appears.
- 4 Click **Accept** if you accept the terms of the agreement, then either open the file or save the file to your PC and open it later.
- 5 Extract the zip files to a temporary folder on your PC.
- 6 Open the NVIDIA driver installation .EXE file to launch the NVIDIA InstallShield Wizard.
- 7 Follow the instructions in the NVIDIA InstallShield Wizard to complete the installation.

**Note:** After the driver installation, Windows may default to 16-bpp color and disable the Desktop Window Manager (DWM). To work around this issue, set the color to 32-bpp and then reboot the PC.

## NVIDIA Driver History

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Release 177 is the latest NVIDIA driver available. [Table 3.1](#) contains a summary of some previous driver releases and the versions associated with them. Some versions listed may not have been released outside of NVIDIA.

**Table 3.1** NVIDIA Drivers for Windows Vista

| Windows Vista Build   | NVIDIA ForceWare Driver   |
|---|---|
| RTM OS Builds 6000 or higher                                  | Release 177: Version 177.35, 177.39, 177.41, 177.79                         |
| RTM OS Builds 6000 or higher                                  | Release 175: Version 175.12, 175.16, 175.19                                 |
| RTM OS Builds 6000 or higher                                  | Release 174: Version 174.16, 174.53, 174.74                                 |
| RTM OS Builds 6000 or higher                                  | Release 169: Version 169.02, 169.04, 169.09, 169.12, 169.13, 169.21, 169.25 |
| RTM OS Builds 6000 or higher                                  | Release 167: Version 167.35   |
| RTM OS Builds 6000 or higher                                  | Release 163: Version 163.11, 163.44, 163.67, 163.69, 163.71, 163.75         |
| RTM OS Builds 6000 or higher                                  | Release 162: Version 162.22   |
| RTM OS Builds 6000 or higher                                  | Release 158: Version 158.14, 158.18, 158.24, 158.42, 158.43, 158.45         |
| RTM OS Builds 6000 or higher                                  | Release 100: Version 100.53, 100.54, 100.59, 100.64, 100.65, 101.41         |
|   | Release 95: Version 97.46   |
| RC2 OS Builds 5744 or higher                                  | Release 95: Version 96.85   |
| RC1 OS Builds 5520.RC1_16384.060812-2235 or higher            | Release 95: Version 96.33   |
| Build 5472.WinMain_idx01_5.060713-1900 or higher              | Release 95: Versions 95.60–96.00  |
| Windows Vista Beta2   | NVIDIA Driver version 88.61   |
| February 06 CTP build 5308.FebCTP_Final.060217-2200 or higher | NVIDIA Drivers 87.15, 87.45   |
| July 05 Vista Beta1   | NVIDIA Driver included 'in the box'.  |
| December 05 CTP build 5270.Winmain.051214-1910                | NVIDIA Driver included 'in the box'.  |

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## APPENDIX



## MODE SUPPORT FOR WINDOWS

This chapter details the Windows modes supported by the Release 177 driver for NVIDIA products. It contains these sections:

- “General Mode Support Information” on page 24
- “Default Modes Supported by GPU” on page 25
- “Modes Supported by TV Encoders” on page 34

## General Mode Support Information

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The NVIDIA graphics driver includes a standard list of display modes that are supported by default. These modes are listed in the section [“Default Modes Supported by GPU”](#) on page 25.

The actual modes available depend on the capabilities of the display. In addition, the NVIDIA graphics driver has a “dynamic EDID detection” capability and will make available *additional* modes that are listed in the display EDID, provided the graphics hardware can support it.

The NVIDIA graphics driver also supports the high resolutions available with the displays listed in [Table A.1](#) as well as the non-standard modes listed in [Table A.2](#).

**Table A.1** Modes Supported for High Resolution Displays

| Display                                     | Maximum Resolution | Hardware Requirements   |
|---|--------------------|---|
| Apple 30" Cinema HD Display (Dual link DVI) | 2560x1600 @ 60 Hz  | <ul style="list-style-type: none"> <li>• All GeForce 7 series GPUs and later</li> <li>• GeForce 6800 Ultra 512</li> <li>• GeForce 6800 with 512 MB</li> </ul> |
| Dell WFP 3007 (Dual Link DVI)               | 2560x1600 @ 60 Hz  |   |
| HP LP3065 dual-link DVI flat panel          | 2560x1600 @ 60Hz.  |   |

**Table A.2** Non-standard Modes Supported

| Resolution  |
|-------------|
| 1680 x 1050 |
| 1366 x 768  |

## Default Modes Supported by GPU

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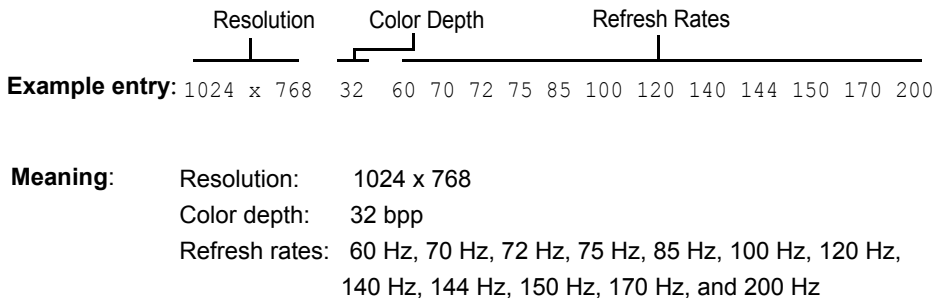
This section lists the modes that are included by default in the driver INF for the following product families:

- “GeForce 9800 GTX” on page 26
- “GeForce 200 Series of GPUs” on page 29
- “nForce 7xx Series” on page 31

## Understanding the Mode Format

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Figure A.1 gives an example of how to read the mode information presented in this section.



**Figure A.1** Mode Format

### Note:

- Horizontal spanning modes of 3840x1080 and above, and vertical spanning modes of 1920x2160 and above generally require at least 32 MB of video memory at 32 bpp.
- An “i” next to the refresh rate indicates an interlaced refresh rate.

## GeForce 9800 GTX

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This sections lists the supported display resolutions, color depths, and refresh rates for the the following products:

- GeForce 9800 GTX
- GeForce 9800 GX2
- GeForce 9800 GT
- GeForce 9600 GT
- GeForce 9600 GSO
- GeForce 9500 GT

### Standard Modes

|             |    |     |    |    |    |     |     |     |     |     |     |     |     |
|-------------|----|-----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|
| 640 x 480   | 8  | 60  | 72 | 75 | 85 | 100 |     |     |     |     |     |     |     |
| 720 x 480   | 8  | 60  |    |    |    |     |     |     |     |     |     |     |     |
| 720 x 576   | 8  | 50  | 60 |    |    |     |     |     |     |     |     |     |     |
| 800 x 600   | 8  | 60  | 72 | 75 | 85 | 100 |     |     |     |     |     |     |     |
| 1024 x 768  | 8  | 60  | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |
| 1152 x 864  | 8  | 60  | 70 | 72 | 75 | 85  | 100 | 120 | 140 | 144 | 150 | 170 | 200 |
| 1280 x 720  | 8  | 60  | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |
| 1280 x 768  | 8  | 60  | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |
| 1280 x 800  | 8  | 60  | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |
| 1280 x 960  | 8  | 60  | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |
| 1280 x 1024 | 8  | 60  | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |
| 1360 x 768  | 8  | 60  | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |
| 1440 x 900  | 8  | 60  | 70 | 72 | 75 | 85  | 100 | 120 | 140 | 144 | 150 | 170 | 200 |
| 1600 x 1200 | 8  | 60  | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |
| 1680 x 1050 | 8  | 60  |    |    |    |     |     |     |     |     |     |     |     |
| 1920 x 1080 | 8  | 30i |    |    |    |     |     |     |     |     |     |     |     |
| 1920 x 1200 | 8  | 60  | 72 | 75 | 85 | 100 |     |     |     |     |     |     |     |
| 1920 x 1440 | 8  | 60  | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |
| 2048 x 1536 | 8  | 60  | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |
| -----       |    |     |    |    |    |     |     |     |     |     |     |     |     |
| 640 x 480   | 16 | 60  | 72 | 75 | 85 | 100 |     |     |     |     |     |     |     |
| 720 x 480   | 16 | 60  |    |    |    |     |     |     |     |     |     |     |     |
| 720 x 576   | 16 | 50  | 60 |    |    |     |     |     |     |     |     |     |     |
| 800 x 600   | 16 | 60  | 72 | 75 | 85 | 100 |     |     |     |     |     |     |     |

|             |    |     |  |
|-------------|----|-----|--|
| 1024 x 768  | 16 |     | 60 70 72 75 85 100                         |
| 1152 x 864  | 16 |     | 60 70 72 75 85 100 120 140 144 150 170 200 |
| 1280 x 720  | 16 |     | 60 70 72 75 85 100                         |
| 1280 x 768  | 16 |     | 60 70 72 75 85 100                         |
| 1280 x 800  | 16 |     | 60 70 72 75 85 100                         |
| 1280 x 960  | 16 |     | 60 70 72 75 85 100                         |
| 1280 x 1024 | 16 |     | 60 70 72 75 85 100                         |
| 1360 x 768  | 16 |     | 60 70 72 75 85 100                         |
| 1440 x 900  | 16 |     | 60 70 72 75 85 100 120 140 144 150 170 200 |
| 1600 x 1200 | 16 |     | 60 70 72 75 85 100                         |
| 1680 x 1050 | 16 |     | 60   |
| 1920 x 1080 | 16 | 30i |  |
| 1920 x 1200 | 16 |     | 60 72 75 85 100                            |
| 1920 x 1440 | 16 |     | 60 70 72 75 85 100                         |
| 2048 x 1536 | 16 |     | 60 70 72 75 85 100                         |

---

|             |    |     |  |
|-------------|----|-----|--|
| 640 x 480   | 32 |     | 60 72 75 85 100                            |
| 720 x 480   | 32 |     | 60   |
| 720 x 576   | 32 | 50  | 60   |
| 800 x 600   | 32 |     | 60 72 75 85 100                            |
| 1024 x 768  | 32 |     | 60 70 72 75 85 100                         |
| 1152 x 864  | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200 |
| 1280 x 720  | 32 |     | 60 70 72 75 85 100                         |
| 1280 x 768  | 32 |     | 60 70 72 75 85 100                         |
| 1280 x 800  | 32 |     | 60 70 72 75 85 100                         |
| 1280 x 960  | 32 |     | 60 70 72 75 85 100                         |
| 1280 x 1024 | 32 |     | 60 70 72 75 85 100                         |
| 1360 x 768  | 32 |     | 60 70 72 75 85 100                         |
| 1440 x 900  | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200 |
| 1600 x 1200 | 32 |     | 60 70 72 75 85 100                         |
| 1680 x 1050 | 32 |     | 60   |
| 1920 x 1080 | 32 | 30i |  |
| 1920 x 1200 | 32 |     | 60 72 75 85                                |
| 1920 x 1440 | 32 |     | 60 70 75 85 100                            |
| 2048 x 1536 | 32 |     | 60 70 75 85 100                            |

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|           |    |    |                 |
|-----------|----|----|-----------------|
| 640 x 480 | 64 |    | 60 72 75 85 100 |
| 720 x 480 | 64 |    | 60              |
| 720 x 576 | 64 | 50 | 60              |

|             |    |     |    |    |    |    |     |     |     |     |     |     |     |     |  |  |  |  |     |
|-------------|----|-----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|-----|
| 800 x 600   | 64 |     | 60 | 72 | 75 | 85 | 100 |     |     |     |     |     |     |     |  |  |  |  |     |
| 1024 x 768  | 64 |     | 60 | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |  |  |  |  |     |
| 1152 x 864  | 64 |     | 60 | 70 | 72 | 75 | 85  | 100 | 120 | 140 | 144 | 150 | 170 | 200 |  |  |  |  |     |
| 1280 x 720  | 64 |     | 60 | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |  |  |  |  |     |
| 1280 x 768  | 64 |     | 60 | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |  |  |  |  |     |
| 1280 x 800  | 64 |     | 60 | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |  |  |  |  |     |
| 1280 x 960  | 64 |     | 60 | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |  |  |  |  |     |
| 1280 x 1024 | 64 |     | 60 | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |  |  |  |  |     |
| 1360 x 768  | 64 |     | 60 | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |  |  |  |  |     |
| 1440 x 900  | 64 |     | 60 | 70 | 72 | 75 | 85  | 100 | 120 | 140 | 144 | 150 | 170 | 200 |  |  |  |  |     |
| 1600 x 1200 | 64 |     | 60 | 70 | 72 | 75 | 85  | 100 |     |     |     |     |     |     |  |  |  |  |     |
| 1680 x 1050 | 64 |     | 60 |    |    |    |     |     |     |     |     |     |     |     |  |  |  |  |     |
| 1920 x 1080 | 64 | 30i |    |    |    |    |     |     |     |     |     |     |     |     |  |  |  |  |     |
| 1920 x 1440 | 64 |     |    |    |    |    |     |     |     |     |     |     |     |     |  |  |  |  | 100 |
| 2048 x 1536 | 64 |     |    |    |    |    |     |     |     |     |     |     |     |     |  |  |  |  | 100 |

## GeForce 200 Series of GPUs

---

This sections lists the supported display resolutions, color depths, and refresh rates for the following products:

- NVIDIA GeForce GTX 280
- NVIDIA GeForce GTX 260

### Standard Modes

|             |   |                 |
|-------------|---|-----------------|
| 640 x 480   | 8 | 60              |
| 800 x 600   | 8 | 60 70 75 85 100 |
| 848 x 480   | 8 | 60 70 75 85 100 |
| 960 x 600   | 8 | 60 70 75 85 100 |
| 1024 x 768  | 8 | 60 70 75 85 100 |
| 1152 x 864  | 8 | 60 70 75 85 100 |
| 1280 x 768  | 8 | 60              |
| 1280 x 800  | 8 | 60              |
| 1280 x 960  | 8 | 60 70 75 85 100 |
| 1280 x 1024 | 8 | 60 70 75 85 100 |
| 1360 x 768  | 8 | 60              |
| 1600 x 1200 | 8 | 60 70 75 85 100 |
| 1680 x 1050 | 8 | 60              |
| 1920 x 1200 | 8 | 60              |
| 1920 x 1440 | 8 | 60 70 75 85 100 |
| 2048 x 1536 | 8 | 60 70 75 85 100 |

---

|             |    |                 |
|-------------|----|-----------------|
| 640 x 480   | 16 | 60              |
| 800 x 600   | 16 | 60 70 75 85 100 |
| 848 x 480   | 16 | 60 70 75 85 100 |
| 960 x 600   | 16 | 60 70 75 85 100 |
| 1024 x 768  | 16 | 60 70 75 85 100 |
| 1152 x 864  | 16 | 60 70 75 85 100 |
| 1280 x 768  | 16 | 60              |
| 1280 x 800  | 16 | 60              |
| 1280 x 960  | 16 | 60 70 75 85 100 |
| 1280 x 1024 | 16 | 60 70 75 85 100 |
| 1360 x 768  | 16 | 60              |
| 1600 x 1200 | 16 | 60 70 75 85 100 |

|             |    |    |    |    |    |     |  |
|-------------|----|----|----|----|----|-----|--|
| 1680 x 1050 | 16 | 60 |    |    |    |     |  |
| 1920 x 1200 | 16 | 60 |    |    |    |     |  |
| 1920 x 1440 | 16 | 60 | 70 | 75 | 85 | 100 |  |
| 2048 x 1536 | 16 | 60 | 70 | 75 | 85 | 100 |  |

---

|             |    |    |    |    |    |     |  |
|-------------|----|----|----|----|----|-----|--|
| 640 x 480   | 32 | 60 |    |    |    |     |  |
| 800 x 600   | 32 | 60 | 70 | 75 | 85 | 100 |  |
| 848 x 480   | 32 | 60 | 70 | 75 | 85 | 100 |  |
| 960 x 600   | 32 | 60 | 70 | 75 | 85 | 100 |  |
| 1024 x 768  | 32 | 60 | 70 | 75 | 85 | 100 |  |
| 1152 x 864  | 32 | 60 | 70 | 75 | 85 | 100 |  |
| 1280 x 768  | 32 | 60 |    |    |    |     |  |
| 1280 x 800  | 32 | 60 |    |    |    |     |  |
| 1280 x 960  | 32 | 60 | 70 | 75 | 85 | 100 |  |
| 1280 x 1024 | 32 | 60 | 70 | 75 | 85 | 100 |  |
| 1360 x 768  | 32 | 60 |    |    |    |     |  |
| 1600 x 1200 | 32 | 60 | 70 | 75 | 85 | 100 |  |
| 1680 x 1050 | 32 | 60 |    |    |    |     |  |
| 1920 x 1200 | 32 | 60 |    |    |    |     |  |
| 1920 x 1440 | 32 | 60 | 70 | 75 | 85 | 100 |  |
| 2048 x 1536 | 32 | 60 | 70 | 75 | 85 | 100 |  |

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|             |    |    |    |    |    |     |  |
|-------------|----|----|----|----|----|-----|--|
| 640 x 480   | 64 | 60 |    |    |    |     |  |
| 800 x 600   | 64 | 60 | 70 | 75 | 85 | 100 |  |
| 848 x 480   | 64 | 60 | 70 | 75 | 85 | 100 |  |
| 960 x 600   | 64 | 60 | 70 | 75 | 85 | 100 |  |
| 1024 x 768  | 64 | 60 | 70 | 75 | 85 | 100 |  |
| 1152 x 864  | 64 | 60 | 70 | 75 | 85 | 100 |  |
| 1280 x 768  | 64 | 60 |    |    |    |     |  |
| 1280 x 800  | 64 | 60 |    |    |    |     |  |
| 1280 x 960  | 64 | 60 | 70 | 75 | 85 | 100 |  |
| 1280 x 1024 | 64 | 60 | 70 | 75 | 85 | 100 |  |
| 1360 x 768  | 64 | 60 |    |    |    |     |  |
| 1600 x 1200 | 64 | 60 | 70 | 75 | 85 | 100 |  |
| 1680 x 1050 | 64 | 60 |    |    |    |     |  |
| 1920 x 1200 | 64 | 60 |    |    |    |     |  |
| 1920 x 1440 | 64 | 60 | 70 | 75 | 85 | 100 |  |
| 2048 x 1536 | 64 | 60 | 70 | 75 | 85 | 100 |  |

## nForce 7xx Series

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This sections lists the supported display resolutions, color depths, and refresh rates for the following products:

- NVIDIA nForce 780a SLI
- NVIDIA nForce 750a SLI

### Standard Modes

|             |   |     |  |
|-------------|---|-----|--|
| 640 x 480   | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 800 x 600   | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 848 x 480   | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 960 x 600   | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1024 x 768  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1152 x 864  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1280 x 720  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 768  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 800  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 960  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 1024 | 8 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 1360 x 768  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 1440 x 900  | 8 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1600 x 1200 | 8 |     | 60 70 72 75 85 100 120                         |
| 1680 x 1050 | 8 |     | 60   |
| 1920 x 1080 | 8 | 30i | 60 70 72 75 85 100                             |
| 1920 x 1200 | 8 |     | 60 70 72 75 85 100                             |
| 1920 x 1440 | 8 |     | 60 70 72 75 85                                 |
| 2048 x 1536 | 8 |     | 60 70 72 75 85                                 |

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|             |    |  |  |
|-------------|----|--|--|
| 640 x 480   | 16 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 800 x 600   | 16 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 848 x 480   | 16 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 960 x 600   | 16 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1024 x 768  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1152 x 864  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1280 x 720  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 768  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 800  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 960  | 16 |  | 60 70 72 75 85 100 120 140 144 150 170         |
| 1280 x 1024 | 16 |  | 60 70 72 75 85 100 120 140 144 150 170         |

|             |    |     |  |
|-------------|----|-----|--|
| 1360 x 768  | 16 |     | 60 70 72 75 85 100 120 140 144 150 170         |
| 1440 x 900  | 16 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1600 x 1200 | 16 |     | 60 70 72 75 85 100 120                         |
| 1680 x 1050 | 16 |     | 60   |
| 1920 x 1080 | 16 | 30i | 60 70 72 75 85 100                             |
| 1920 x 1200 | 16 |     | 60 70 72 75 85 100                             |
| 1920 x 1440 | 16 |     | 60 70 72 75 85                                 |
| 2048 x 1536 | 16 |     | 60 70 72 75 85                                 |
| -----       |    |     |  |
| 640 x 480   | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 800 x 600   | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 848 x 480   | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 960 x 600   | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1024 x 768  | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1152 x 864  | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1280 x 720  | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 1280 x 768  | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 1280 x 800  | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 1280 x 960  | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 1280 x 1024 | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 1360 x 768  | 32 |     | 60 70 72 75 85 100 120 140 144 150             |
| 1440 x 900  | 32 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1600 x 1200 | 32 |     | 60 70 72 75 85 100                             |
| 1680 x 1050 | 32 |     | 60   |
| 1920 x 1080 | 32 | 30i | 60 70 72 75 85                                 |
| 1920 x 1200 | 32 |     | 60 70 72 75 85                                 |
| 1920 x 1440 | 32 |     | 60 70 72 75 85                                 |
| 2048 x 1536 | 32 |     | 60 70 72 75 85                                 |
| -----       |    |     |  |
| 640 x 480   | 64 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 800 x 600   | 64 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 848 x 480   | 64 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 960 x 600   | 64 |     | 60 70 72 75 85 100 120 140 144 150 170 200 240 |
| 1024 x 768  | 64 |     | 70   |
| 1152 x 864  | 64 |     | 60 70 72 75 85 100 120 140 144 150 170 200     |
| 1280 x 720  | 64 |     | 70   |
| 1280 x 768  | 64 |     | 60 70 72 75 85 100                             |
| 1280 x 800  | 64 |     | 60 70 72 75 85 100                             |
| 1280 x 960  | 64 |     | 60 70 72 75 85 100                             |

|             |    |     |  |
|-------------|----|-----|--|
| 1280 x 1024 | 64 |     | 60 70 72 75 85 100                         |
| 1360 x 768  | 64 |     | 60 70 72 75 85 100                         |
| 1440 x 900  | 64 |     | 60 70 72 75 85 100 120 140 144 150 170 200 |
| 1600 x 1200 | 64 |     | 60 70 72 75 85 100                         |
| 1680 x 1050 | 64 |     | 60   |
| 1920 x 1080 | 64 | 30i |  |
| 1920 x 1200 | 64 |     | 70   |
| 1920 x 1440 | 64 |     | 60 70 72 75 85                             |
| 2048 x 1536 | 64 |     | 60 70 72 75 85                             |

## Modes Supported by TV Encoders

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Table A.3 and Table A.4 list the NTSC, PAL, and HDTV TV-Out modes supported by the NVIDIA driver.

**Table A.3** Mode Support for S-Video and Composite Out

| Resolution | Bit depth | Comments   |
|------------|-----------|--|
| 320x200    | 8, 16, 32 | DirectDraw mode; not selectable as a Windows desktop |
| 320x240    | 8, 16, 32 | DirectDraw mode; not selectable as a Windows desktop |
| 640x400    | 8, 16, 32 | DirectDraw mode; not selectable as a Windows desktop |
| 640x480    | 8, 16, 32 |  |
| 720x480    | 8, 16, 32 | Overscans (for video)                                |
| 720x576    | 8, 16, 32 | Overscans (for video)                                |
| 800x600    | 8, 16, 32 |  |
| 1024x768   | 8, 16, 32 | Conexant 25871 only                                  |

**Table A.4** Mode Support for Component YPrPb Out and DVI Out

| Resolution   | Comments   |
|--------------|--|
| 480i (SDTV)  | Supported on graphics boards with Conexant 875 or Philips 7108 TV encoders and compatible connectors, and compatible GeForce 6 Series and GeForce 7 Series GPUs. |
| 480p (EDTV)  |  |
| 720p (HDTV)  |  |
| 1080i (HDTV) |  |
| 576i (PAL)   |  |
| 576p (PAL)   |  |

The driver supports manual overscan correction for component and DVI outputs. See the *ForceWare Graphics Driver User's Guide* for instructions on how to use the overscan correction features in the control panel.