Hercules

Installation Guide

Stingray

Hercules

Hercules Stingray™

Installation Guide

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Introduction

About Your Card

Thank you for purchasing one of our Hercules Stingray™ cards. For the most part, the various models available in the Stingray family operate identically. Model specific information will be identified by displaying the relevant model names or numbers in italics.

Other model specific information can be found in the README.TXT file located on the Stingray Installation Diskette. Instructions for viewing the README file can be found under "Getting Help" in this chapter.

A little later on, you'll learn how to use our installation software to tell which Stingray product you're using.

About Power Playback™ for Video

(Stingray/Video models only)

Available on all models in the Stingray/Video line, Hercules' new Power Playback for Video significantly enhances the playback of video clips by combining hardware and software to offload certain video playback functions from the CPU.

If you've ever played a video clip with the Windows media player and attempted to scale it to a larger size by dragging the corner of the video window, you've probably noticed that playback performance drops significantly. This is because your PC must now expand the video image "on the fly" by inserting extra pixels when it displays each frame. This is a CPU-intensive process, and the extra work that must be done for each frame interferes with the PC's ability to keep the sound in synchronization with the video image, and reduces the number of frames that your system can display per second. The result is choppy playback with a high percentage of dropped frames. In many cases, you're limited to playing video clips at their original resolution to get acceptable performance. Since most video clips have a resolution of 320x200 or lower, running Windows at an 800x600 resolution or higher results in the effect commonly known as "postage stamp video."

Another problem with scaling video playback to fit your screen is the "blocky" effect of increasing the pixel size. Windows increases the size of the video image by simply replicating individual pixels. This results in images that are less sharp, with jagged lines and lower definition.

The Stingray/Video models eliminate these problems in most cases by allowing the PC to offload the work of scaling video clips. The result is smoother playback with better audio synchronization and fewer dropped frames. Power Playback also provides automatic filtering and smoothing, which improves the quality of expanded video images through a process called *interpolation*: instead of simply duplicating pixels, Power Playback computes the chromatic average of the surrounding pixels and sets the color of the new pixels accordingly.

Power Playback on the Stingray/Video series of graphics accelerators works with Microsoft's Video For Windows 1.1D or later (earlier versions did not offer the DCI support necessary for hardware multimedia acceleration) and video clips encoded with DCI-compliant CODECs (compression-decompression methods). For the latest information on CODECs with DCI support, please see the README.TXT file on your Stingray Installation Diskette.

The Stingray family's excellent memory transfer rate makes it an ideal product for

both Windows and MS-DOS multimedia applications. However, Power Playback is available only under Windows when the video can be scaled to larger or smaller than its original size. Some multimedia applications do not give you the ability to scale video playback, and cannot take advantage of Power Playback on the Stingray/Video line.

Before You Begin

One of the most important things you can do before installing your card is to read through the "Quick Start" chapter immediately following this introduction. Make sure you understand all the instructions *before* you begin the installation. If you don't, please follow the detailed instructions found in the chapter titled "Installing Your Stingray."

Register your card!

Please take a moment and fill out the enclosed Warranty Registration Card. Our technical support, driver updates and other services are available only to registered users. Don't be just another pretty face in the crowd...register your card today!

For reference, please record your serial number and purchase information here:

_____
Model Number

_____
Serial Number

_____
Date of purchase

Getting Help

We've tried to make the installation, configuration and use of Stingray as simple and painless as possible. However, system configurations vary widely and there is no way to guarantee you won't have a problem. If you do encounter a problem, please follow these steps:

1. Read the manual and double check that you've followed the instructions.
2. Look under "Troubleshooting" in this manual.
3. Look in the README.TXT file. It's on the Installation diskette and can be viewed by placing the diskette in your drive, switching to that drive and typing:

   `README [Enter]`

at the DOS prompt. The instructions for viewing the file will appear on the screen.

If you still have problems after trying all the above, please contact our Technical Support Department.

Contacting Hercules Technical Support

There are now six ways to contact our Technical Support Department:

- Phone them at 510-623-6050. The hours are 6:00am to 6:00pm Pacific Time, Monday through Friday.
- Send a fax to 510-490-6745.
- Visit our CompuServe forum. Just type GO HERCULES at any "!" prompt to get there. Please post your questions publicly in our section; sending them as private e-mail will delay a response.
- Call our BBS at 510-623-7449. It's available 24 hours a day, 365 days a year and supports 2400 to 14.4K bps rates. The communication parameters are N,8,1. Along with technical support and drivers, our BBS has many popular shareware programs and utilities.
- Send e-mail via the Internet to support@hercules.com.
- Send a letter by U.S. mail:

  Hercules Technical Support
  3839 Spinnaker Court
  Fremont, CA 94538

If you have a modem, CompuServe and our BBS offer another advantage: you can get help from other Hercules users. Unless you've found an obscure problem, the chances are good you'll find the answer just by browsing through the current messages. If not, another user will probably have the answer handy – a big help during the hours we're not available!

Obtaining The Latest Drivers

If you are experiencing problems, especially with newly released applications or upgrades, you should check to make sure you're using the latest release of our software. We are constantly improving our drivers and the newest version may already have a fix for your problem.

The latest shipping version of our software is always available for downloading from CompuServe and our BBS, and can be found on Anonymous FTP sites on the Internet. (A list of FTP sites can be found in the README.TXT file on your Stingray Installation Diskette.)

You can also obtain a copy, for a nominal shipping and handling charge, by contacting our Customer Service department at 800-532-0600.

Update Notification

Whenever we release new drivers, notices are posted on the following services: CompuServe, the Hercules BBS, and our Internet-based Hercules Information Server mailing list. We do not automatically send release notification to our end-users.

Users with Internet access can subscribe to the Hercules Information Server mailing list by sending an e-mail message to:

`update@hercules.com`

with the word `subscribe` in the message body on a line by itself. An automated reply will acknowledge your subscription. When a new version of software for any of our products is released, you will receive an e-mail message telling you where you can obtain the drivers.

CompuServe customers can subscribe to the Hercules Information Server mailing list using the following address:

`>INTERNET:update@hercules.com`

You may also send Internet mail via Prodigy, America Online, and other online services. Please see your online service documentation for instructions.

Quick Start

Don't start yet!

This is the abbreviated version of the installation documentation. We're assuming you're already familiar with issues like installing cards in your computer, preventing static discharge, monitor timings, etc. If you aren't, *please* skip ahead to the chapter titled "Basic Installation." You can damage your monitor, your system or your new Stingray card if you do not install the hardware and software correctly.

Make sure you read the whole Quick Start chapter before you start installing your Stingray. Spending a few minutes now can save you a lot of time later!

A note on Memory Managers

If you are using a memory manager, such as QEMM, 386MAX or EMM386, Stingray requires the following memory range to be excluded:

A000-C7FF

Make sure that this area is excluded *before* proceeding with the installation.

In addition, there may be some settings that are not compatible with the Stingray. Please refer to "Appendix B: Memory Managers" found in this manual and the README file found on the installation diskette for additional information.

A note on Windows 3.1 Drivers

If you will be installing the Windows 3.1 drivers, Windows must be installed and running with the *standard* Windows VGA drivers before installing the Stingray drivers. If Windows is not yet on your system, or isn't configured with the Microsoft VGA drivers, please do this *before* proceeding with the Stingray software installation.

If you are using a replacement for Windows' Program Manager, such as Symantec's Norton Desktop for Windows or Central Point Software's PC Tools for Windows, the creation of the Hercules program group may fail. You have two options: you can temporarily disable the alternate desktop manager *before* installing the Stingray software; or you can follow the directions in the chapter titled "Using Windows 3.1" for manually creating the program group.

Installing the hardware

NOTE: If your AUTOEXEC.BAT file launches Windows, you should temporarily comment out the WIN command before installing either the hardware or the software. After the installation is complete, you can go back to booting straight into Windows.

1. Remove any existing EGA, VGA or SuperVGA card from your system, or disable the built-in VGA. You cannot disable Stingray's built-in VGA circuitry.
2. Confirm the jumper settings on your card by looking in Appendix A. In most configurations, you shouldn't have to change any of the settings.
3. Install the Stingray into the appropriate slot and secure it in place. Close up your system.

Installing the software

Stingray comes with a simple, menu-driven installation process. The install software sets up the monitor type and optionally installs the Windows 3.1 drivers. At your option, it can also make any required modifications to your system files.

Support for the VESA Video BIOS Extensions (VBE) is included in Stingray's BIOS, so there is no VESA driver to install. Because VBE is integrated into the BIOS, the VESA "SuperVGA" modes are always available.

Running Install

To install the software, follow these steps:

1. Power up your system and place the Hercules Stingray Installation Diskette into a floppy drive. Log on to that drive.
2. Look at the README.TXT file. Type:

   ```
   README [Enter]
   ```

   The directions for using the file viewing software are on the screen.

   Please don't skip this step! Important, last minute changes are documented in README.TXT and reviewing this file now could save you a lot of time and effort later.
3. To begin installing the software, type:

   ```
   INSTALL [Enter]
   ```

   Just follow the on-screen prompts. You'll be asked to supply the following information:

   a. The drive and directory for the Stingray file. The default is C:\HERCULES.

   b. The manufacturer and model of monitor you are using (or if that isn't listed, its maximum horizontal scan rate).

   c. Whether or not you would like to install the Windows 3.1 drivers.

   d. Whether or not you would like INSTALL to modify your system files. If you answer NO, you'll need to make the changes yourself.
4. If you installed the Windows drivers, you must run the DOS-based Windows SETUP program *before* starting Windows. Select "Hercules Stingray..." from the list of available video drivers. When prompted, choose "Keep Driver."

When you start Windows, a new program group, called Hercules, will automatically be created. Details on the contents of this group can be found in the "Using Windows 3.1" chapter in this manual.

Additional Drivers

Video for Windows

(Stingray/Video models only)

We've included a copy of the runtime version of Microsoft's Video for Windows with your Stingray/Video product so you can get the most out of Power Playback. If you don't already have Video for Windows installed on your PC, or if the version you have is older than the version we've supplied (particularly if your version is prior to 1.1D, the first version to fully support the DCI standard), you'll want to install the runtime version of Video for Windows that we've supplied. After you've installed the Stingray Windows drivers according to the instructions, start Windows and run the SETUP.EXE program on the Video for Windows diskette. If you are using Program Manager, this is accomplished by following these steps:

1. Place the Video for Windows Runtime diskette in drive A:.

2. Select File/Run from the Program Manager.
3. Type A:\SETUP at the prompt.

Supplemental Display Drivers

One or more Supplemental Drivers Diskettes (depending on your model of Stingray) are available by downloading from our BBS and CompuServe, via Anonymous FTP sites on the Internet, or by calling our Customer Service department. These diskettes contain drivers for the following operating systems and applications:

- IBM OS/2
- Microsoft Windows NT

Instructions for installing each of these drivers are in the README files on the Supplemental Drivers diskettes.

That's all, folks!

You're finished with the installation! If you encounter any problems running Stingray, please review the full instructions in "Basic Installation" and the "Troubleshooting" chapter.

Basic Installation

Before you start

Before you begin installing your new Stingray, it is important that you follow these steps. You're probably eager to get started, but following these directions step by step will save you a lot of time!

A note on the README file

Throughout this manual, you'll find references to README.TXT. This important file contains all of the last minute information we couldn't put into the documentation. Please look over the file before you begin.

We've provided an easy to use program to display or print the file. To use it, just put the Installation Diskette into your disk drive, make that drive the current one, and type:

```
README [Enter]
```

at the DOS prompt. The directions for viewing the file are on the screen.

About your Monitor

Your Stingray card can work with almost any analog RGB monitor, from simple, VGA only monitors to high-end, multi-frequency monitors with scan rates as high as 78kHz or more.

The installation software for Stingray will prompt you to select your monitor from a list of the most popular manufacturers and models. If your monitor isn't listed, you can select from a number of "generic" monitors. These are listed by their maximum horizontal scan rate (also called horizontal frequency), or by a generic name like "SuperVGA monitor."

To select the proper generic monitor type, you should consult your monitor's technical documentation, or contact the monitor manufacturer, and determine the monitor's maximum horizontal scan rate.

This is a very important step! Selecting an incorrect monitor type can result in something a simple as a scrambled screen or as severe as a damaged monitor.

If you cannot find your monitor on the list, and you are unable to locate the horizontal scan rate but still want to get your Stingray card installed, please select the generic "31.5 kHz" monitor type. This will limit you to 640x480 resolution, but won't allow you to damage your monitor. After you've contacted your monitor manufacturer and determined the appropriate settings for your monitor, it is easy to go back and reconfigure Stingray's software.

Boot to DOS!

Your system may be set up to go right into Windows, bypassing the DOS prompt, whenever you boot. If this is true of your system, you *must* edit your AUTOEXEC.BAT file before installing the Stingray hardware.

Using any text editor, like EDIT or NOTEPAD, open AUTOEXEC.BAT and locate the line that starts with:

```
WIN
```

Comment out the WIN command by entering REM at the beginning of the line. It should look like this:

```
REM WIN
```

NOTE: There may be additional switches (e.g., /S) after the WIN command; do not change or edit them!

Save the file and reboot your system. Instead of going straight into Windows, you should be at the standard DOS prompt.

At this point, you're ready to start installing the hardware.

After Stingray has successfully been installed, you can go back and remove the REM command so your system will again boot directly into Windows.

A note on Memory Managers

Many systems use memory managers. These highly sophisticated applications work with your 386 and higher processor to optimize the use of your system's memory.

If you are using an extended memory manager, like EMM386, QEMM or 386MAX, you will probably need to make some adjustments to your configuration before installing the Stingray.

Stingray uses memory in the VGA range and you must exclude this area from use or relocation by your memory manager. If you don't, you will probably experience a wide range of problems, including complete system lock-ups.

The range to exclude is:

A000-C7FF

Consult the documentation on your memory manager for a detailed explanation of excluding memory ranges.

Other features of memory managers, such as QEMM's Stealth Mode, may be incompatible with Stingray. Please refer to "Appendix B: Memory Managers" in this manual for additional information on some of the most popular memory managers.

A note on Windows 3.1 Drivers

If you will be installing the Windows 3.1 drivers, Windows must be installed and running with the *standard* Windows VGA drivers before installing the Stingray drivers. If Windows is not yet on your system, or isn't configured with the Microsoft VGA drivers, please do this *before* proceeding with the Stingray software installation.

During the installation process, a new program group, called Hercules, will be created. The group contains the Windows utility software, like Picture Window, provided with Stingray. If you are using a replacement for Windows' Program Manager, such as Symantec's Norton Desktop for Windows or Central Point Software's PC Tools for Windows, the creation of the Hercules program group may fail.

When using replacement desktops, you have two options: you can temporarily disable the alternate desktop manager *before* installing the Stingray software; or you can follow the directions in the chapter titled "Using Windows 3.1" for manually creating the program group.

A note on VESA drivers

VESA is an acronym for Video Electronics Standard Association. It is a group of hardware and software manufacturers dedicated to creating standards for simplifying and improving the interface between video hardware devices, like monitors and cards, and software applications.

When you see the term "VESA driver," it is referring to the BIOS extensions, commonly called VBE (for Video BIOS Extensions), developed by VESA. These extensions allow for software to set the video mode and display text and graphics with a single driver. This should not be confused with the VESA VL-Bus, or VESA Local Bus, specification!

The VL-Bus is a hardware specification for connecting video cards directly to the CPU for better performance. You can run software written to use VESA drivers on any system, whether it has a VL-Bus slot or not. Conversely, even if you have a VL-Bus system, you'll need to have VESA drivers if your software requires them.

Many of today's hottest DOS-based software applications either support or require the VESA VBE. Stingray has the VESA VBE right in the BIOS, so you don't have to load a TSR program to take advantage of the VESA modes!

Installing the hardware

WARNING! Before handling your Stingray, be sure to ground yourself by touching the system unit. This will help prevent an inadvertent discharge of static electricity that may harm the board.

If you haven't installed a card in your system before, you may want to review your system documentation before proceeding. Familiarize yourself with how the system unit cover is removed/replaced and any special instructions your system manufacturer provides for installing new cards.

1. Turn off the power to your system unit and all peripherals. Unplug the monitor and power cords from the system unit. Remove the system unit cover.
2. Remove any existing CGA, EGA, VGA, SuperVGA or Windows accelerator card. Stingray includes support for these standards and cannot coexist with other video cards that have the same capabilities.

   Similarly, if your motherboard includes a built-in VGA or Windows accelerator, you must disable it before proceeding. If you are unsure of how to do this, consult your system documentation or contact the manufacturer.
3. Select an appropriate slot for your Stingray:

   VL-Bus Stingray models require a VESA Local Bus slot and will not work in any other slot.

   PCI local bus Stingray models require a PCI slot and will not work in any other slot.
4. Align the card with the slot. Apply even downward pressure until the card is fully seated. When installing VL-Bus versions of Stingray, note that the Stingray has two sets of connectors about 2.5 inches (6.35 cm) apart. Make sure both the connectors go in at the same time – don't push one end in before the other or you may damage the motherboard.
5. Make sure the board is fully seated and then secure the board with the screw you removed in step 2. .
6. Replace the system unit cover and reattach the monitor and power cord.

Installing the software

Before starting the software installation process, please be sure that you've followed the directions found in this chapter under the section titled "Before You Start." It will save you a lot of time and trouble later.

In the following examples, we'll assume the defaults for the installation process: you'll be installing the software from drive A: and into the C:\HERCULES directory. If you are installing from a different floppy disk drive or to a different drive and directory, just substitute those in the examples.

To install the Stingray's software, follow these steps:

1. Place the Installation Diskette in drive A: and log to that drive by typing:

   `A: [Enter]`

2. Start the installation software by typing:

   `INSTALL [Enter]`

   NOTE: The installation program was designed to be used with a mouse. If you do not have a mouse, or your mouse driver is not loaded in DOS, you'll need to use your keyboard to navigate through INSTALL. Press [F1] for additional information on using the keyboard in INSTALL.

3. You will be presented a dialog box asking for the source and destination for the Stingray software. If the source drive is incorrect, backspace over it and enter the correct drive.

   If you want to use a different drive or directory name for the Stingray files, replace the default, C:\HERCULES, with the drive and directory you choose. If the directory doesn't exist, INSTALL will create it.

4. Click on the Okay button or press O to begin installing the Stingray software. INSTALL will copy a number of files to your hard drive.

5. Once INSTALL has finished copying the basic files, you will be asked if INSTALL should modify your AUTOEXEC.BAT file, adding the C:\HERCULES directory to your DOS PATH setting. If you select "Yes," INSTALL will save a copy of the original file under AUTOEXEC.SAV and then make the modification.

   If you select "No," no changes will be made. You can go back later and modify your AUTOEXEC.BAT yourself. If you are not familiar with editing files, with AUTOEXEC.BAT or with the DOS PATH, we recommend that you allow INSTALL to make the changes for you.

6. Next, you'll be asked to specify the monitor you are using. If your monitor is in the list presented, just highlight it and select "Okay" to continue. If your monitor is not on the list, select "None of the above."

   If you select "None of the above," you will be presented a list of generic monitor classes, defined by the horizontal scan rate of your monitor. Highlight the scan rate that corresponds to your monitor, and select "Okay" to continue.

   NOTE: Some of the generic monitor classes have ExtraStable™ or SuperStable™ refresh rates. These video modes can deliver up to 75Hz or 90Hz vertical refresh rates (depending on your model of Stingray) for improved visual ergonomics. For complete details on using ExtraStable or SuperStable video modes, please see "SETCRT" in the "Stingray Utilities" chapter.

7. Once INSTALL has copied the appropriate monitor settings to a file called MYSCREEN.CRT in the C:\HERCULES directory, you will be asked if INSTALL should modify your AUTOEXEC.BAT file to add the SETCRT utility.

   SETCRT configures the Stingray for your monitor by loading the settings contained in MYSCREEN.CRT. If you do not run SETCRT, you may not be able to use all of the video modes supported by your monitor.

   In order to maximize Stingray's performance with your monitor, we strongly recommend that you allow INSTALL to add this lines to your AUTOEXEC.BAT. If you decide not to have INSTALL make this change, you will need to make it yourself. INSTALL will copy your original AUTOEXEC.BAT file as AUTOEXEC.SAV before making any changes.

   For additional information on the SETCRT utility, please refer to the chapter titled "Stingray Utilities" in this guide.

8. The next dialog box presents you with a list of the application drivers that can be installed.

   You will be presented with one option:

   [ ] Copy Windows 3.1 drivers

   If you want to install the Windows 3.1 drivers, select them – an "X" will appear in the box. If you do not, simply leave the box blank. Select "Okay" to continue.

   NOTE: The drivers found on the Supplemental Drivers Diskettes, such as OS/2 or Windows NT will not appear on this list. Instructions for installing these drivers can be found in the README.TXT file on the diskettes.

If you did not select the Windows drivers, you may skip ahead to step 10.

9. If you selected "Copy Windows 3.1 Drivers," you'll be asked to specify your Windows directory (for example, C:\WINDOWS). If the path suggested by INSTALL is incorrect, backspace over it and enter the correct drive and directory. For network installations, be sure to specify your local directory.

   You will then be asked if you would like INSTALL to copy the standard Windows font files during the installation of the drivers. Stingray ships with the standard Microsoft Windows screen fonts for the English character set. If you are using a different character set, such as German, select "No" to preserve your existing screen fonts. Otherwise, we recommend that you select "Yes."

   Before you can run Windows with the high-performance Windows drivers, you will need to run the DOS-based Windows SETUP utility. Please refer to the section titled "Using Windows 3.1" for complete instructions.

10. You are now finished with the installation of the Stingray software. You may exit the INSTALL program by selecting "Exit," or choose "Continue" to remain in INSTALL.

    Be sure to reboot your computer before proceeding, so that any changes made to your AUTOEXEC.BAT will be reflected in your system.

Additional Drivers

Video for Windows

(Stingray/Video models only)

We've included a copy of the runtime version of Microsoft's Video for Windows with your Stingray/Video product so you can get the most out of Power Playback. If you don't already have Video for Windows installed on your PC, or if the version you have is older than the version we've supplied (particularly if your version is prior to 1.1D, the first version to fully support

the DCI standard), you'll want to install the runtime version of Video for Windows that we've supplied. After you've installed the Stingray Windows drivers according to the instructions, start Windows and run the SETUP.EXE program on the Video for Windows diskette. If you are using Program Manager, this is accomplished by following these steps:

1. Place the Video for Windows Runtime diskette in drive A:.
2. Select File/Run from the Program Manager.
3. Type A:\SETUP at the prompt.

Supplemental Display Drivers

One or more Supplemental Drivers Diskettes (depending on your model of Stingray) are available by downloading from our BBS, CompuServe, via Anonymous FTP sites on the Internet, or by calling our Customer Service department. They contain drivers for the following:

- IBM OS/2
- Microsoft Windows NT

Instructions for installing these drivers can be found in the README.TXT file on the Supplemental Drivers diskettes.

Using Windows 3.1

Configuring Windows

Before you can use Stingray's high performance drivers in Windows, you must configure Windows. To do this, you must have the following:

1. Windows installed and running the standard VGA drivers.
2. The Stingray drivers copied into your Windows SYSTEM directory using Hercules' INSTALL program.

If you haven't installed Windows or the Stingray drivers, please do so before continuing.

The following examples assume that Windows is installed in C:\WINDOWS. If you've installed Windows on a different drive or in a different subdirectory, just substitute those wherever you see C:\WINDOWS.

Running Windows Setup

You only need to run Windows' SETUP whenever you install or update the Stingray drivers or change monitor types. To change resolutions or color depths, you can use the Picture Window application. You'll find information on Picture Window a little later in this chapter. If you encounter any problems, please refer to the "Troubleshooting" section in this guide.

To configure Windows to use the Stingray drivers, you need to run the DOS-based Windows SETUP program.

1. Change to your Windows subdirectory by typing:

   ```
   CD \WINDOWS [Enter]
   ```

2. Run SETUP by typing:

   ```
   SETUP [Enter]
   ```

   SETUP will analyze your current system configuration and display the settings. Move the highlight bar up to the line that says "Display" and press [Enter].

3. You will see a list of all the display drivers available on your system. Using the Up and Down arrow keys, scroll through the list and select the "Hercules Stingray..." entry. Press [Enter] to select the drivers.
4. After a moment, you'll be asked to either replace or keep the existing Stingray display driver. Just press [Enter] to keep the current driver.
5. After another moment or two, you will be returned to the DOS prompt. You may now start Windows by typing:

   ```
   WIN [Enter]
   ```

   Whenever you start Windows after running SETUP, it will appear in 640x480 resolution. To change resolutions, use the Picture Window utility.

Creating The Hercules Program Group

The first time you run Windows after installing the Stingray software using INSTALL , a program group called Hercules will be created. This group contains The Hercules Touch™, our integrated suite of utilities for your Stingray.

The program group is automatically created by an application called WINSTALL that uses DDE (Dynamic Data Exchange) with Windows' Program Manager. Occasionally, the DDE link fails, and the program group will not be created. If this happens, you need to create the program group by hand.

To manually create the program group, follow these steps.

1. Switch your desktop back to Program Manager. Consult the documentation that came with your software for details on how to do this.
2. Select File, New... from the Program Manager menu.
3. Select Program Group and click on the Okay button. Enter Hercules for the name of the group.
4. Select File, New... from the Program Manager menu again.
5. This time, select Program Item and click on the Okay button.
6. You will get a dialog box that asks for the program description, the filename and the working directory. Assuming you've installed the Stingray software in the default (C:\HERCULES) directory, here is the program item you want to create:

   Description:
   The Hercules Touch
   Command Line:
   C:\HERCULES\TOUCH.EXE
   Working Directory:
   C:\HERCULES

The Hercules Touch

The Hercules Touch is an integrated set of Windows 3.1 utilities for managing the Stingray. It consists of the following programs:

Picture Window™– Use a simple, intuitive interface to select your resolution, pixel depth and other Windows' desktop settings.

Adjust™ (not available on Stingray models S501 and S801) – Change screen size and position, then save the settings for use every time you boot. Ideal for monitors without digital controls.

Refresh Rate Meter™– Calculate and display your current refresh rate.

Speedy™– A Windows benchmark for measuring the performance of your Stingray.

Wallpaper Express™– No more wading through clunky Control Panel applets to change your Windows wallpaper! Makes selecting wallpaper a breeze.

Zoom In™ – Magnify and edit select areas of your desktop up to 8x. Gives you an up-close view when you really need it..

Power Down™ – Controls the VESA Display Power Management Signaling features on your Stingray to help reduce power consumption on DPMS-equipped monitors.

Power Preview™ – View and launch AVI files with this powerful control center for your video clip library.

Power Player™ – An easy-to-use AVI player with a VCR-style interface.

Complete directions for using these utilities are available through extensive, on-line context-sensitive help.

Updating Windows 3.1 Drivers

From time to time, Hercules may release new Windows drivers for your Stingray card. These updated drivers may include enhancements to performance or stability, or new features. The latest production drivers are available by downloading from CompuServe or our BBS, or from our Customer Service department for a nominal shipping and handling charge.

To update your current Stingray drivers, follow these steps. We're assuming you're starting with Windows installed and running Stingray's drivers already, and that you've installed your Stingray software in the default C:\HERCULES directory.

Two sets of directions are provided: updating from a complete Stingray Windows Display Driver Diskette; and updating when you just have one or more specific driver files.

Updating with a Windows Display Driver Diskette

You use Stingray's INSTALL utility to update your Windows drivers. Just follow these steps:

1. Exit Windows completely. DO NOT run INSTALL in a DOS shell launched from Windows.
2. Change to the \HERCULES directory by typing:

   `CD \HERCULES [Enter]`
3. Launch the INSTALL program by typing:

   `HERCULES [Enter]`

   This starts the INSTALL program without causing it to do a complete re-installation of your software.
4. Select the Options menu. If you are not using a mouse, press [Alt O]. Choose "Install Application Drivers."
5. When the dialog box appears, select "Install Windows 3.1 Drivers" and click "Okay" to continue.
6. Now you'll be asked to specify your Windows directory (for example, C:\WINDOWS). If the path suggested by INSTALL is incorrect, backspace over it and enter the correct drive and directory.
7. Since you are updating your drivers, INSTALL will warn you that it has found Stingray drivers already installed and will ask you if you would like to continue. Click "Okay" to continue.
8. Next, you will be asked if you would like INSTALL to copy the standard Windows font files during the installation of the drivers. Stingray ships with the standard Microsoft Windows screen fonts for the English character set. If you are using a different character set, such as German, select "No" to preserve your existing screen fonts.
9. Once INSTALL has completed copying all of the files, you can exit by pressing [Alt X].

You must re-run Windows SETUP to initialize the new drivers. For complete instructions, see "Running Windows Setup" under the section titled "Configuring Windows" in this chapter.

Updating with specific driver files

This method for updating will rarely be used. Most often, this type of update will occur when our Technical Support department is working with you to resolve a problem.

If you have one or more replacement Windows drivers – these are files with a .DRV extension – or a replacement VDD driver, you can install them using the following steps. We are assuming you are copying the files from drive A: and that Windows is installed in C:\WINDOWS.

NOTE: DO NOT use this method unless the complete set of Stingray Windows Display Drivers has already been installed. If it hasn't, please do so before proceeding.

1. Place the diskette with the new drivers in driver A: and log to that drive by typing:

   ```
   A: [Enter]
   ```

2. Copy the driver files to your Windows \SYSTEM subdirectory:

   ```
   COPY *.DRV C:\WINDOWS\SYSTEM
   ```

3. If you have a new VDD*.386 file, copy it as well:

   ```
   COPY *.386 C:\WINDOWS\SYSTEM
   ```

4. If you have a new "386 Grabber" file, you'll want to copy it, too:

   ```
   COPY *.3GR C:\WINDOWS\SYSTEM
   ```

Once the files are copied, you can start Windows by typing:

```
WIN [Enter]
```


Stingray Utilities

This chapter covers the various utility programs that ship with Stingray. As we are constantly updating our software, there may be new or improved utilities on your Stingray software disks. Please see the README.TXT file on the Installation Diskette for the latest information.

Install and Configure

INSTALL is the easy to use, menu-driven application that is responsible for installing and configuring Stingray's software. Generally, you run INSTALL from the Installation Diskette to install the Stingray software. In some cases, you may want to go back and change a monitor setting, install a driver you skipped during the original installation or just check on Stingray's operating status.

Assuming you've installed your Stingray software in C:\HERCULES, follow these steps:

1. Change to the \HERCULES directory by typing:

   ```
   CD \HERCULES [Enter]
   ```

2. Launch INSTALL by typing:

   ```
   HERCULES [Enter]
   ```

This will launch INSTALL and allow you to specify what you want to do. The options are detailed below.

Changing your monitor selection

Before changing your monitor selection, it is a good idea to remove any previous SETCRT commands from your AUTOEXEC.BAT file. This eliminates the possibility of having multiple SETCRT statements.

Using any ASCII text editor, such as EDIT, open your AUTOEXEC.BAT file and delete all SETCRT commands. Typically, they look like this:

```
C:\HERCULES\SETCRT filename
```

After you've selected a new monitor, INSTALL can add this command back into your AUTOEXEC.BAT for you.

To select your new monitor, follow these steps:

1. After modifying your AUTOEXEC.BAT file, start INSTALL as shown earlier in this chapter.

2. Open the Options menu and choose "Select Monitor Type." If you are using a keyboard, press [Alt O] and use the Up and Down arrow keys to move through the menu.

3. You will be asked to specify the monitor you are using. If your monitor is in the list presented, just highlight it and select "Okay" to continue. If your monitor is not on the list, select the "None of the above" button.

   If you select "None of the above," you will be presented a list of generic monitor classes, defined by the horizontal scan rate of your monitor. Highlight the class that corresponds to your monitor, and select "Okay" to continue.

   NOTE: Some of the generic monitor classes have ExtraStable™ or SuperStable™ refresh rates. These video modes can deliver up to 75Hz or 90Hz vertical refresh rates (depending on your model of

Stingray) for improved visual ergonomics. For complete details on using ExtraStable or SuperStable video modes, please see "SETCRT" in the "Stingray Utilities" chapter.

4. You'll be asked to put the Stingray Installation Diskette into drive A:. Once the new monitor timings have been copied, you can exit INSTALL and reboot your system.

Operating Status

The "Operating Status" option shows you the current configuration of your Stingray video card, including the product name, BIOS version, display memory, current monitor selection and other configuration information.

To view the current operating status, follow these steps:

1. Start INSTALL as shown earlier in this chapter.
2. Open the "Options" menu and choose "Operating Status." INSTALL will check your Stingray hardware and software configuration and present the information in a dialog box.

When you are done, select Okay to return to the main INSTALL screen. You exit INSTALL by pressing [Alt X] or selecting Exit from the Options menu.

Adding Windows drivers

At any time after you've completed the basic installation, you can use INSTALL to add the Windows 3.1 drivers by following these steps:

1. Start INSTALL as shown earlier in this chapter.
2. Open the "Options" menu and select "Install Application Drivers."
3. Highlight the "Copy Windows 3.1 drivers" option and press "Okay" to begin the installation. For complete details on these drivers, please refer to "Installing the software" in the "Basic Installation" chapter.

Tuning your Display

SETCRT

SETCRT sets up Stingray to work with your monitor. By default, INSTALL has configured SETCRT to use the monitor timings specified in MYSCREEN.CRT, created when you selected your monitor during the installation process. You can also run SETCRT with command line arguments to try timings different from those specified in MYSCREEN.CRT.

To run SETCRT to configure Stingray for your monitor, follow these steps:

1. Change to the directory containing the Stingray software by typing:

```
CD \HERCULES [Enter]
```

There are two ways to run SETCRT to configure Stingray for your monitor: with a .CRT file or with a specific combination of monitor timings you specify.

To run SETCRT with a .CRT file

2a. Type SETCRT *crt_filename* [Enter] at the DOS prompt. Using the default .CRT file created by INSTALL, you would type the following:

```
SETCRT MYSCREEN.CRT[Enter]
```

To run SETCRT with specific timings

2b. You can use SETCRT with the -n option to specify any combination of refresh rates you choose. The syntax is:

```
SETCRT -n  r1  r2  r3  r4
```

where r1 is the value for 640x480 resolution;
where r2 is the value for 800x600 resolution;
where r3 is the value for 1024x768 resolution; and
where r4 is the value for 1280x1024 resolution.

Stingray Pro Model S902 also supports the 1600x1200x256 resolution. This mode operates at a fixed 56kHz horizontal scan rate and an 86Hz (interlaced) vertical refresh rate, so no corresponding SETCRT parameter is necessary.

The following tables list the screen refresh rates available at each resolution.

NOTE: DO NOT choose a refresh rate higher than your monitor can support. If you do, you may permanently damage your monitor. If you are unsure of what refresh rates are supported, please refer to the documentation on your monitor or contact the manufacturer. Please locate this information before attempting to use SETCRT.

Models S501, S801

Resolution	Value	16/256 colors		32K/64K colors		16.7M colors	
		Horz. (kHz)	Vert (Hz)	Horz. (kHz)	Vert (Hz)	Horz. (kHz)	Vert (Hz)
640x480	0	31.5	60	31.5	60	31.5	60
	1	38.0	72	37.5	72	31.5	60
	2	38.5	75	37.5	75	31.5	60
800x600	0	35.5	56	35.5	56	--	--
	1	38.0	60	37.5	60	--	--
	2	48.0	72	48.0	72	--	--
	3	48.0	75	37.5	60	--	--
1024x768	0	35.5	87(I)	--	--	--	--
	1	48.5	60	--	--	--	--
	2	56	70	--	--	--	--
	3	58	72	--	--	--	--
1280x1024	0	48.0	87(I)	--	--	--	--
				--	--	--	--

(I) Interlaced modes

Models S601e, S901e, S901V, S1201V, S1202V

Resolution	Value	16 colors Horz. (kHz)	16 colors Vert (Hz)	256 colors Horz. (kHz)	256 colors Vert (Hz)	64K colors Horz. (kHz)	64K colors Vert (Hz)	16.7M colors Horz. (kHz)	16.7M colors Vert (Hz)
640x480	0	--	--	31.5	60	31.5	60	31.5	60
	1	--	--	38	72	38	72	31.5	60
	2	--	--	48.5	90	48.5	90	31.5	60
	2‡	--	--	48.5	90	48.5	90	38	72
800x600	0	--	--	35.5	56	35.5	56	35.5*	56*
	1	--	--	38	60	38	60	38.5*	60*
	2	--	--	48	72	48	72	48*	72*
	3	--	--	60.5	90	48	72	48*	75*
	3†	--	--	60.5	90	48	75	48*	75*
1024x768	0	--	--	35.5	86(I)	35.5*	86(I)*	--	--
	1	--	--	48.5	60	48.5*	60*	--	--
	2	--	--	56.5	70	56.5*	70*	--	--
	3	--	--	60.5	75	60.5*	75*	--	--
1280x1024	0	48.5	86(I)	48.5*	86(I)*	--	--	--	--
	1	48.5	86(I)	64*	60*	--	--	--	--
	1§	64	60	--	--	--	--	--	--
	2‡	48.5	86(I)	76	70	--	--	--	--
	3‡	48.5	86(I)	79.5	75	--	--	--	--
1600x1200	--	--	--	60*	86(I)*	--	--	--	--

(I) Interlaced modes
§ Model S901V only
† Models S1201V, S1202V only
‡ Model S1202V only
* Model S1202V only (requires 2MB of DRAM).

To see what refresh rates are currently selected, follow these steps:

1. Change to the directory containing the Stingray software by typing:

   ```
   CD \HERCULES [Enter]
   ```

2. Display the current settings by typing:

   ```
   SETCRT -S
   ```

SETMODE

(Stingray Pro and Stingray/Video models.)

You may use this DOS utility to select from a number of graphics and text modes.

To use SETMODE, follow these steps:

1. To select a mode from a menu, type SETMODE without any parameters.

   Within SETMODE's menu, you can use the arrow key and [Enter] to select a new mode. Pressing [ESC] exits SETMODE without changing the current mode.

2. To see what mode your Stingray Pro is using now, type SETMODE ?.

3. To select a mode from the command line, type SETMODE *n*, where *n* is the mode number. For a list of mode numbers, type SETMODE without any parameters.

NOTE: *The majority of DOS text and graphics applications are designed to operate at only one resolution, or contain their own facility for selecting resolutions. The use of SETMODE to select graphics modes will be of more use to programmers than to typical users, and you will probably find SETMODE most useful for setting extended text modes, such as 132x43 (mode 26).*

VMODE

(Stingray models S501 and S801 only)

VMODE is a utility that allows you to set Stingray's emulation or display modes in DOS.

Before you can use VMODE, you must install it using the following steps:

1. Change to the directory containing the Stingray software by typing:

   ```
   CD \HERCULES [Enter]
   ```

2. Run VMODE by typing:

   ```
   VMODE [Enter]
   ```

   You will be presented a menu-driver interface to select the video or emulation mode you want to use.

You can also use VMODE from the command line by following these steps:

1. To see the VMODE help screens, type:

   ```
   VMODE ? [Enter]
   ```

2. To set a video or emulation mode, type:

   ```
   VMODE display_mode [Enter]
   ```

   For example, to use the 132 column by 44 row extended text mode, you would type:

   ```
   VMODE 22 [Enter]
   ```

NOTE: *The majority of DOS text and graphics applications are designed to operate at only one resolution, or contain their own facility for selecting resolutions. The use of VMODE to select graphics modes will be of more use to programmers than to typical users, and you will probably find VMODE most useful for setting extended text modes, such as 132x44 (mode 22).*

ALANSI.SYS

(Stingray models S501 and S801 only)

ANSI.SYS is a device driver, supplied with DOS, that defines functions for display mode settings, cursor movement and keyboard control. Because ANSI.SYS ships with DOS, which has support only for MDA, CGA, EGA and VGA modes, you cannot use it with Stingray's extended video modes.

ALANSI.SYS is an extended version of ANSI.SYS and allows you to take advantage of the extended video modes. It is fully compatible with ANSI.SYS and supports the same re-mapping commands.

To use ALANSI.SYS, just replace the line:

```
DEVICE=ANSI.SYS
```

in your CONFIG.SYS file with the line:

```
DEVICE=C:\HERCULES\ALANSI.SYS
```

You can use any ASCII text editor, such as EDIT, to make the change. Once you've made the change and saved your file, you'll need to reboot your system.

NOTE: Do not load both ANSI.SYS and ALANSI.SYS or your system may hang.

For additional information on using screen control and keyboard remapping features, please refer to the ANSI.SYS section in your DOS reference manual.

DPMS Screen Saver

(Stingray models S501 and S801 only)

A DOS-based DPMS, called DDPMS.EXE, is supplied to allow your Stingray to take advantage of DPMS-compliant monitors,

reducing power consumption when you are not using your system.

To launch the DOS-based DPMS program, follow these steps:

1. Change to the directory containing the Stingray software by typing:

   ```
   CD \HERCULES [Enter]
   ```

2. Run DDPMS by typing:

   ```
   DDPMS [Enter]
   ```

   A counter will appear in the upper right corner showing the time elapsed since last keyboard activity.

3. To activate the DDPMS menu, press the left and right [Shift] keys at the same time.

   a. Use the + and – keys to change the timeout.

   b. Type "U" to unload the DPMS screen saver.

   c. Press [Esc] when finished.

Diagnostics

VDIAG

VDIAG is a diagnostic utility you can use to test Stingray's video modes. You may be asked to run this program if you contact our Technical Support Department with a problem.

To run VDIAG, follow these steps:

1. Change to the directory containing the Stingray software by typing:

   ```
   CD \HERCULES [Enter]
   ```

2. Run VDIAG by typing:

   ```
   VDIAG [Enter]
   ```

Just follow the on-screen prompts to run through the diagnostics.

Troubleshooting

The Stingray Installation Diskette contains a comprehensive troubleshooting guide called TROUBLE.TXT. Arranged in a question-and-answer format, it covers problems with installation, DOS and DOS applications, Windows 3.1 and Windows applications.

The installation process automatically copies the file to your hard disk in the directory you selected (the default is C:\HERCULES).

You may read or print TROUBLE.TXT with any Windows text editor or word processor (NOTEPAD works very well), or a DOS-based text editor such as EDIT.

For example, to open TROUBLE.TXT in DOS you could type the following:

```
CD \HERCULES [Enter]
EDIT TROUBLE.TXT [Enter]
```

The latest version of TROUBLE.TXT is also available for downloading from our BBS, CompuServe, and Anonymous FTP sites. The file will be updated from time to time to reflect new operating systems or applications.

Most of the common problems you might encounter are covered in this file. If you're having problems, please take a moment to review this file before contacting Hercules.

Limited Warranty

Hercules Computer Technology, Inc. (HCT) warrants this Hercules product to be free from defects in materials and workmanship for a period of two years from the date of purchase from HCT or an authorized dealer. Should this Hercules product fail to be in good working order at any time during the two year period, HCT will, at its option, repair or replace it at no additional charge, except as set out below. Replacement parts will be either reconditioned or new, and the replaced parts will become the property of HCT. This limited warranty does not cover damage from accident, disaster, abuse, misuse, or unauthorized repair or modification.

Limited warranty service may be obtained by delivering this product to an authorized Hercules dealer along with proof of purchase date. If the product is mailed directly to HCT, you must first obtain a return authorization number (RMA) from HCT, and send the board freight prepaid. You must insure the product or assume the risk of loss or damage in transit and you must return it in its original shipping container or equivalent.

All express and implied warranties for this Hercules product, including warranties of merchantability and fitness for a particular purpose, are limited to two years from the date of purchase. No warranties, either express or implied, will apply after this period. Some states do not allow limitations on implied warranties, so this limitation may not apply to you.

If this Hercules product is not in good working order, your sole and exclusive remedy shall be repair or replacement as described above. In no event will HCT be liable for damages arising out of the use of or inability to use this product. Some states do not allow exclusion or limitation of incidental or consequential damages from consumer products, so these limitations may not apply to you.

This limited warranty gives you specific legal rights, and you may have other rights which vary from state to state.

FCC Notice

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, and
2. This device must accept any interference received, including interference that may cause undesired operation.

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

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING

To comply with Part 15 of the FCC Rules, shielded cables are required when connecting the card to the monitor.

Changes or modifications not expressly approved in writing by Hercules Computer Technology, Inc. may void the user's authority to operate this equipment.

Appendix A: Jumper Settings

The jumper settings are listed by model number. To determine the model number for your Stingray, you can look at the outside of the box or check the "Operating Status" using the directions found under the section titled "Install and Configure" in the "Stingray Utilities" chapter. Stingray models not listed do not have user-configurable jumper settings.

All jumpers on Stingray have two possibilities: open and closed. To "close" a jumper, a shorting block is placed over the two pins. To "open" a jumper, you can either remove the shorting block completely or just move it so that only one of the pins covered. We recommend the second option – moving the shorting block to just one pin – as it will help prevent you from losing the shorting block.

Stingray Pro models S901e and S901V have one jumper, labelled JP1. This jumper is not operational, and the position of the shorting block has no effect.

Model S501

Jumper	Pins	Description
J3	Reserved	Not currently used.
J4	Closed†	33/40 Mhz VL-Bus clock speed
	Open	50 Mhz VL-Bus clock speed

Model S801

Jumper	Pins	Description
J1	Open†	Disable IRQ2. This will eliminate conflicts with another device using IRQ2, but may affect CGA compatibility.
	Closed	Enable IRQ2.

Model S601e

Jumper	Pins	Description
J1	Open	Zero VL-bus wait states. This setting may be incompatible with some computers.
	Closed†	One VL-bus wait state.
J3	Open†	Disable IRQ9. This will eliminate conflicts with another device using IRQ9, but may affect CGA compatibility.
	Closed	Enable IRQ9.

Models S1201V, S1202V

Jumper	Pins	Description
JP1	Open†	Enable PCI latency timer
	Closed	Disable PCI latency timer

† Factory default setting.

Appendix B: Memory Managers

The Hercules Stingray utilizes memory in the VGA address range. If you experience random problems, you may have a memory conflict. Try excluding the address ranges from A000 to C7FF (note the first address is "A" followed by three zeros), from use by 386/486 memory management software.

Virtually all VGA cards use the A000-AFFF and C000-C7FF memory ranges, and no matter what memory manager you use, it should automatically detect the presence of a VGA card and exclude these regions. However, we recommend that you explicitly exclude all the ranges listed below as an extra precaution.

QEMM386

Using an ASCII text editor, modify the QEMM386 command line in your CONFIG.SYS file to include the following parameter:

```
X=A000-C7FF
```

(e.g. "DEVICE=C:\QEMM\QEMM386.SYS X=A000-C7FF")

QEMM provides a feature known as "Stealth" that attempts to free upper memory by finding unused space in the BIOS area used by cards like Stingray. If you are using Stealth – you'll find an ST:M or ST:F parameter on the QEMM command line in CONFIG.SYS if you are – and you are experiencing problems with Stingray, you should exclude Stingray's BIOS by adding the following parameter to the QEMM command line:

```
XST=C000
```

This tells QEMM not to "stealth" any BIOS in the C000 memory page, preventing QEMM from inadvertently overwriting a portion of Stingray's BIOS.

EMM386

Using an ASCII text editor, modify EMM386 command line in your CONFIG.SYS file to include the following parameter:

```
X=A000-C7FF
```

(e.g. "DEVICE=C:\DOS\EMM386.EXE X=A000-C7FF")

386MAX

Using an ASCII text editor, open the 386MAX.PRO file and insert the following line:

```
RAM=A000-C800
```

Windows SYSTEM.INI

Using an ASCII text editor, open SYSTEM.INI and insert the following line in the [386Enh] section:

```
[386Enh]
EMMExclude=A000-C7FF
```

Appendix C: Technical Specs

Memory and I/O Address Locations

The memory and address locations are listed by the model number for your Stingray. To determine the model number for your Stingray, you can look at the outside of the box or check the "Operating Status" using the directions found under the section titled "Install and Configure" in the "Stingray Utilities" chapter.

Models S501, S801

Display memory addresses:

```
A0000h-BFFFFh
```

ROM BIOS:

```
C0000h-C7FFFh
```

I/O locations:

```
3B0-3DF
```

Models S601e, S901e, S901V, S1201V, S1202V

Display memory addresses:

```
A0000h-BFFFFh
```

ROM BIOS:

```
C0000h-C7FFFh
```

Coprocessor Registers:

```
A8000h-A807Eh or
B8000h-B807Eh
(programmable)
```

I/O locations:

```
3B0-3DF
```

Analog Video Connector Pinouts

All Stingray cards use standard DB-15 connectors.

All Stingray Models

Pin	Description
1	Red
2	Green
3	Blue
4	Not Used
5	Ground
6	Ground
7	Ground
8	Ground
9	Not Used
10	Ground
11	Not Used
12	Not Used
13	Horizontal Sync
14	Vertical Sync
15	Not Used

Feature Connector Pin Assignment

The feature connector found on the Stingray delivers pixel data from the graphics accelerator chip onboard to an external device.

All Stingray Models

Pin	Description
1	Pixel Data 0
2	Pixel Data 1
3	Pixel Data 2
4	Pixel Data 3
5	Pixel Data 4
6	Pixel Data 5
7	Pixel Data 6
8	Pixel Data 7
9	Pixel Clock
10	Blank Signal
11	Horizontal Sync
12	Vertical Sync
17	Enable External Pixel Data †
18	Enable External Sync ‡
19	Enable External Pixel Clock §
13–16, 22–24	Ground
20, 21, 25, 26	Not Used

† When pin 17 is pulled low, Pixel Data from Feature Connector is disabled.

‡ When pin 18 is pulled low, Sync and Blank signals from Feature Connector are disabled.

§ When pin 19 is pulled low, Pixel Clock from Feature Connector is disabled.

Appendix D: Stingray Display Modes

The following tables list all of the video modes available from all the different Stingray models.

The refresh rates, resolutions and pixel depths listed here are driver dependent and may not be available in all operating systems or applications. In addition to these chipset-specific mode numbers, all Stingray models are VESA VBE compliant and may be addressed using standard VESA VBE mode numbers.

All Stingray Models

Mode (in Hex)	Type of Mode	Screen Resolution	Number of Colors	Max. Characters	Buffer Start	Character Size	Pages	Video Clock (MHz)	Horiz. Freq. (kHz)	Vert. Freq. (Hz)
0	Text	320 x 200	16	40 x 25	B8000	8 x 8	8	28.322	31.50	70.00
0*	Text	320 x 350	16	40 x 25	B8000	8 x 14	8	28.322	31.50	70.00
0**	Text	360 x 400	16	40 x 25	B8000	9 x 16	8	28.322	31.50	70.00
1	Text	320 x 200	16	40 x 25	B8000	8 x 8	8	28.322	31.50	70.00
1*	Text	320 x 350	16	40 x 25	B8000	8 x 14	8	28.322	31.50	70.00
1**	Text	360 x 400	16	40 x 25	B8000	9 x 16	8	28.322	31.50	70.00
2	Text	640 x 200	16	80 x 25	B8000	8 x 8	8	28.322	31.50	70.00
2*	Text	640 x 350	16	80 x 25	B8000	8 x 14	8	28.322	31.50	70.00
2**	Text	720 x 400	16	80 x 25	B8000	9 x 16	8	28.322	31.50	70.00
3	Text	640 x 200	16	80 x 25	B8000	8 x 8	8	28.322	31.50	70.00
3*	Text	640 x 350	16	80 x 25	B8000	8 x 14	8	28.322	31.50	70.00
3**	Text	720 x 400	16	80 x 25	B8000	9 x 16	8	28.322	31.50	70.00
4	Graphics	320 x 200	4	40 x 25	B8000	8 x 8	1	25.175	31.50	70.00
5	Graphics	320 x 200	4	40 x 25	B8000	8 x 8	1	25.175	31.50	70.00
6	Graphics	640 x 200	2	80 x 25	B8000	8 x 8	1	25.175	31.50	70.00
7	Text	720 x 350	Mono	80 x 25	B0000	9 x 14	8	28.322	31.50	70.00
7**	Text	720 x 400	Mono	80 x 25	B0000	9 x 16	8	28.322	31.50	70.00
D	Graphics	320 x 200	16	40 x 25	A0000	8 x 8	8	25.175	31.50	70.00
E	Graphics	640 x 200	16	80 x 25	A0000	8 x 8	4	25.175	31.50	70.00
F	Graphics	640 x 350	Mono	80 x 25	A0000	8 x 14	2	25.175	31.50	70.00
10	Graphics	640 x 350	16	80 x 25	A0000	8 x 14	2	25.175	31.50	70.00
11	Graphics	640 x 480	2	80 x 30	A0000	8 x 16	1	25.175	31.50	60.00
12	Graphics	640 x 480	16	80 x 30	A0000	8 x 16	1	25.175	31.50	60.00
13	Graphics	320 x 200	256	40 x 25	A0000	8 x 8	1	25.175	31.50	70.00

Notes:

(I) Interlaced modes
* Extended graphics adapter text modes with 350 scan lines
** 9x16 character cell enhanced text modes with 400 scan lines

Models S501, S801

Mode (in Hex)	Type of Mode	Screen Resolution	Number of Colors	Max. Characters	Buffer Start	Character Size	Pages	Video Clock (MHz)	Horiz. Freq. (kHz)	Vert. Freq. (Hz)
20	Text	1188 x 350	16	132x25	B8000	8 x14	2	42.500	31.50	70.00
21	Text	1188 x 480	16	132 x 30	B8000	8 x 16	2	42.500	31.50	60.00
22	Text	1188 x 473	16	132 x 43	B8000	8 x 8	2	42.500	31.50	60.00
23	Text	1188 x 480	16	132 x 60	B8000	8 x 8	4	42.500	31.50	60.00
24	Text	720 x 480	16	720 x480	B8000	9 x 16	4	28.322	31.50	70.00
25	Text	720 x 473	16	80 x 43	B8000	9 x 8	2	28.322	31.50	60.00
26	Text	720 x 480	16	80 x 60	B8000	9 x 8	2	28.322	31.50	60.00
29	Graphics	640x400	256	80 x 25	A0000	8 x 16	1	25.175	31.50	60.00
2A	Graphics	640x480	256	80 x 30	A0000	8 x 16	1	25.175	31.50	60.00
2A	Graphics	640x480	256	80 x 30	A0000	8 x 16	1	37.500	31.50	72.00
2A	Graphics	640x480	256	80 x 30	A0000	8 x 16	1	37.500	31.50	75.00
2B	Graphics	800 x 600	16	100 x 75	A0000	8 x 8	1	36.000	35.50	56.00
2B	Graphics	800 x 600	16	100 x 75	A0000	8 x 8	1	40.000	40.00	60.00
2B	Graphics	800 x 600	16	100 x 75	A0000	8 x 8	1	50.350	50.00	72.00
2B	Graphics	800 x 600	16	100 x 75	A0000	8 x 8	1	63.000	50.00	75.00
2C	Graphics	800 x 600	256	100 x 75	A0000	8 x 8	1	36.000	35.50	56.00
2C	Graphics	800 x 600	256	100 x 75	A0000	8 x 8	1	40.000	40.00	60.00
2C	Graphics	800 x 600	256	100 x 75	A0000	8 x 8	1	50.350	50.00	72.00
2C	Graphics	800 x 600	256	100 x 75	A0000	8 x 8	1	63.000	50.00	75.00
2D	Graphics	768 x 1024	16	96 x 64	A0000	8 x 16	1	45.000	39.00	70.00
2E	Graphics	768 x 1024	256	96 x 64	A0000	8 x 16	1	45.000	39.00	72.00
30	Graphics	1024 x 768	16	128 x 48	A0000	8 x 16	1	45.00	35.5	87.00(I)
30	Graphics	1024 x 768	16	128 x 48	A0000	8 x 16	1	65.00	48.00	60.00
30	Graphics	1024 x 768	16	128 x 48	A0000	8 x 16	1	75.00	56.00	70.00
30	Graphics	1024 x 768	16	128 x 48	A0000	8 x 16	1	79.00	58.00	72.00
30	Graphics	1024 x 768	16	128 x 48	A0000	8 x 16	1	79.00	60.00	75.00
31	Graphics	1024 x 768	256	128 x 48	A0000	8 x 16	1	65.00	48.00	60.00
31	Graphics	1024 x 768	256	128 x 48	A0000	8 x 16	1	75.00	56.00	70.00
31	Graphics	1024 x 768	256	128 x 48	A0000	8 x 16	1	79.00	58.00	72.00
31	Graphics	1024 x 768	256	128 x 48	A0000	8 x 16	1	79.00	60.00	75.00
36	Graphics	1280 x 1024	16	160 x 64	A0000	8 x 16	1	75.00	48.00	87.00(I)
42	Graphics	640x400	64K	80 x 25	A0000	8 x 16	1	50.000	31.50	70.00
43	Graphics	640x480	64K	80 x 30	A0000	8 x 16	1	50.000	31.50	60.00
43	Graphics	640x480	64K	80 x 30	A0000	8 x 16	1	63.000	37.50	72.00
43	Graphics	640x480	64K	80 x 30	A0000	8 x 16	1	63.000	37.50	75.00

Models S501, S801 (Continued)

Mode (in Hex)	Type of Mode	Screen Resolution	Number of Colors	Max. Characters	Buffer Start	Character Size	Pages	Video Clock (MHz)	Horiz. Freq. (kHz)	Vert. Freq. (Hz)
44	Graphics	800 x 600	64K	100 x 75	A0000	8 x 8	1	72.000	35.50	56.00
44	Graphics	800 x 600	64K	100 x 75	A0000	8 x 9	1	80.000	37.50	60.00
48	Graphics	640 x 480	16.7 mill.	N/A	A0000	8 x 16	1	75.000	31.50	60.00

Notes:

(I) Interlaced modes
* Extended graphics adapter text modes with 350 scan lines
** 9x16 character cell enhanced text modes with 400 scan lines

Models S601e, S901e

Mode (in Hex)	Type of Mode	Screen Resolution	Number of Colors	Max. Characters	Buffer Start	Character Size	Pages	Video Clock (MHz)	Horiz. Freq. (kHz)	Vert. Freq. (Hz)
31,6A	Graphics	800x600	16	100x37	A0000	8x16	1	36.0	35.5	56.0
31,6A	Graphics	800x600	16	100x37	A0000	8x16	1	40.0	38	60.0
31,6A	Graphics	800x600	16	100x37	A0000	8x16	1	50.0	48	72.0
31,6A	Graphics	800x600	16	100x37	A0000	8x16	1	65.0	60.5	90.0
32	Graphics	1024x768	16	128x48	A0000	8x16	1	44.90	35.5	86(I)
32	Graphics	1024x768	16	128x48	A0000	8x16	1	65.00	48.5	60.0
32	Graphics	1024x768	16	128x48	A0000	8x16	1	75.00	56.5	70.0
32	Graphics	1024x768	16	128x48	A0000	8x16	1	80.00	60.5	75.0
33	Graphics	1280x1024	16	160x64	A0000	8x16	1	77.0	48.0	86(I)
40	Graphics	640x480	256	80x30	A0000	8x16	1	25.18	31.5	60.0
40	Graphics	640x480	256	80x30	A0000	8x16	1	31.50	38.0	72.0
40	Graphics	640x480	256	80x30	A0000	8x16	1	40.00	48.5	90.0
41	Graphics	800x600	256	100x37	A0000	8x16	1	36.0	35.5	56.0
41	Graphics	800x600	256	100x37	A0000	8x16	1	40.0	38.0	60.0
41	Graphics	800x600	256	100x37	A0000	8x16	1	50.0	48.0	72.0
41	Graphics	800x600	256	100x37	A0000	8x16	1	65.0	60.5	90.0
42	Graphics	1024x768	256	128x48	A0000	8x16	1	44.9	35.5	86(I)
42	Graphics	1024x768	256	128x48	A0000	8x16	1	65.0	48.5	60.0
42	Graphics	1024x768	256	128x48	A0000	8x16	1	75.0	56.5	70.0
42	Graphics	1024x768	256	128x48	A0000	8x16	1	80.0	60.3	75.0
50	Graphics	640x480	32K	80x30	A0000	8x16	1	50.0	31.5	60.0
50	Graphics	640x480	32K	80x30	A0000	8x16	1	65.0	38.0	72.0
50	Graphics	640x480	32K	80x30	A0000	8x16	1	80.0	48.5	90.0
51	Graphics	800x600	32K	100x37	A0000	8x16	1	72.0	35.5	56.0
51	Graphics	800x600	32K	100x37	A0000	8x16	1	80.0	38.0	60.0

Models S601e, S901e (continued)

Mode (in Hex)	Type of Mode	Screen Resolution	Number of Colors	Max. Characters	Buffer Start	Character Size	Pages	Video Clock (MHz)	Horiz. Freq. (kHz)	Vert. Freq. (Hz)
54	Graphics	640x480	64K	80x30	A0000	8x16	1	50.0	31.5	60.0
54	Graphics	640x480	64K	80x30	A0000	8x16	1	65.0	38.0	72.0
54	Graphics	640x480	64K	80x30	A0000	8x16	1	80.0	48.5	90.0
55	Graphics	800x600	64K	100x37	A0000	8x16	1	72.0	35.5	56.0
55	Graphics	800x600	64K	100x37	A0000	8x16	1	80.0	38.0	60.0
58	Graphics	640x480	16.7M	80x30	A0000	8x16	1	75.0	31.5	60.0

Notes:

(I) Interlaced modes

Models S901V, S1201V, S1202V

Mode (in Hex)	Type of Mode	Screen Resolution	Number of Colors	Max. Characters	Buffer Start	Character Size	Pages	Video Clock (MHz)	Horiz. Freq. (kHz)	Vert. Freq. (Hz)
31,6A	Graphics	800x600	16	100x37	A0000	8x16	1	36.0	35.5	56.0
31,6A	Graphics	800x600	16	100x37	A0000	8x16	1	40.0	38	60.0
31,6A	Graphics	800x600	16	100x37	A0000	8x16	1	50.0	48	72.0
31,6A	Graphics	800x600	16	100x37	A0000	8x16	1	65.0	48	75.0
32	Graphics	1024x768	16	128x48	A0000	8x16	1	44.90	35.5	86(I)
32	Graphics	1024x768	16	128x48	A0000	8x16	1	65.00	48.5	60.0
32	Graphics	1024x768	16	128x48	A0000	8x16	1	75.00	56.5	70.0
32	Graphics	1024x768	16	128x48	A0000	8x16	1	80.00	60.5	75.0
33	Graphics	1280x1024	16	160x64	A0000	8x16	1	77.0	48.0	86(I)
33	Graphics	1280x1024	16	160x64	A0000	8x16	1	110.0	64.5	60.0
40	Graphics	640x480	256	80x30	A0000	8x16	1	25.18	31.5	60.0
40	Graphics	640x480	256	80x30	A0000	8x16	1	31.50	38.0	72.0
40	Graphics	640x480	256	80x30	A0000	8x16	1	40.00	48.5	90.0
41	Graphics	800x600	256	100x37	A0000	8x16	1	36.0	35.5	56.0
41	Graphics	800x600	256	100x37	A0000	8x16	1	40.0	38.0	60.0
41	Graphics	800x600	256	100x37	A0000	8x16	1	50.0	48.0	72.0
41	Graphics	800x600	256	100x37	A0000	8x16	1	65.0	60.5	90.0
42	Graphics	1024x768	256	128x48	A0000	8x16	1	44.9	35.5	86(I)
42	Graphics	1024x768	256	128x48	A0000	8x16	1	65.0	48.5	60.0
42	Graphics	1024x768	256	128x48	A0000	8x16	1	75.0	56.5	70.0
42	Graphics	1024x768	256	128x48	A0000	8x16	1	80.0	60.5	75.0
43*	Graphics	1280x1024	256	160x64	A0000	8x16	1	77.0	48.5	86(I)
43*	Graphics	1280x1024	256	160x64	A0000	8x16	1	50**2	64.0	60.0
43*	Graphics	1280x1024	256	160x64	A0000	8x16	1	65**2	76	70

Models S901V, S1201V, S1202V (continued)

Mode (in Hex)	Type of Mode	Screen Resolution	Number of Colors	Max. Characters	Buffer Start	Character Size	Pages	Video Clock (MHz)	Horiz. Freq. (kHz)	Vert. Freq. (Hz)
43*	Graphics	1280x1024	256	160x64	A0000	8x16	1	65*2	79.5	75
44*	Graphics	1600x1200	256	200x75	A0000	8x16	1	65*2	60.0	86(I)
50	Graphics	640x480	32K	80x30	A0000	8x16	1	50.0	31.5	60.0
50	Graphics	640x480	32K	80x30	A0000	8x16	1	65.0	38.0	72.0
50	Graphics	640x480	32K	80x30	A0000	8x16	1	80.0	48.5	90.0
51	Graphics	800x600	32K	100x37	A0000	8x16	1	72.0	35.5	56.0
51	Graphics	800x600	32K	100x37	A0000	8x16	1	80.0	38.0	60.0
51	Graphics	800x600	32K	100x37	A0000	8x16	1	95.0	48.0	72.0
51†	Graphics	800x600	32K	100x37	A0000	8x16	1	50.0	48.0	75.0
52*	Graphics	1024x768	32K	128x48	A0000	8x16	1	95.0	35.5	87(I)
54	Graphics	640x480	64K	80x30	A0000	8x16	1	50.0	31.5	60.0
54	Graphics	640x480	64K	80x30	A0000	8x16	1	65.0	38.0	72.0
54	Graphics	640x480	64K	80x30	A0000	8x16	1	80.0	48.5	90.0
55	Graphics	800x600	64K	100x37	A0000	8x16	1	72.0	35.5	56.0
55	Graphics	800x600	64K	100x37	A0000	8x16	1	80.0	38.0	60.0
55	Graphics	800x600	64K	100x37	A0000	8x16	1	95.0	48.0	72.0
55†	Graphics	800x600	64K	100x37	A0000	8x16	1	50.0	48.0	75.0
56*	Graphics	1024x768	64K	128x48	A0000	8x16	1	44.9	35.5	86(I)
56*	Graphics	1024x768	64K	128x48	A0000	8x16	1	65	48.5	60.0
56*	Graphics	1024x768	64K	128x48	A0000	8x16	1	75	56.5	70.0
56*	Graphics	1024x768	64K	128x48	A0000	8x16	1	80	60.5	75.0
58	Graphics	640x480	16.7M	80x30	A0000	8x16	1	75	31.5	60.0
58†	Graphics	640x480	16.7M	80x30	A0000	8x16	1	50	31.5	60.0
58†	Graphics	640x480	16.7M	80x30	A0000	8x16	1	65	38.0	72.0
59*	Graphics	800x600	16.7M	100x37	A0000	8x16	1	72	35.5	56.0
59*	Graphics	800x600	16.7M	100x37	A0000	8x16	1	80	38.0	60.0
59*	Graphics	800x600	16.7M	100x37	A0000	8x16	1	94.5	48.0	72.0
59*	Graphics	800x600	16.7M	100x37	A0000	8x16	1	94.5	48.0	75.0

Notes:

(I) Interlaced modes
* Model S1202V only (requires 2MB of DRAM)
† Models S1201V, S1202V only

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