TABLE OF CONTENTS

This manual is for SP3800 (Voodoo Banshee) and SP391 (Savage3D)

1. Voodoo Banshee Features

General Features

- Fully integrated 128-bit VGA/2D/3D/Video Accelerator
- Ultimate 3D experience with 100 Mpixels/sec and 4 Million triangles/sec
- No-compromise 3D image quality at frame rates
- Optimized for software DVD acceleration (Optional)
- Full VMI interface (including a host port) for optional:
  Full hardware DVD decoding, Video capturing, TV tuner support
- High-resolution 1600x1200 85Hz with a 230MHz RAMDAC
- PC97 and PC98 rev 1.0 compliant

- VESA DDC2B support

2D Acceleration
- Full featured 128-bit BitBlt Engine & Windows GUI Acceleration
- Source and Destination Chroma-keying for DirectDraw

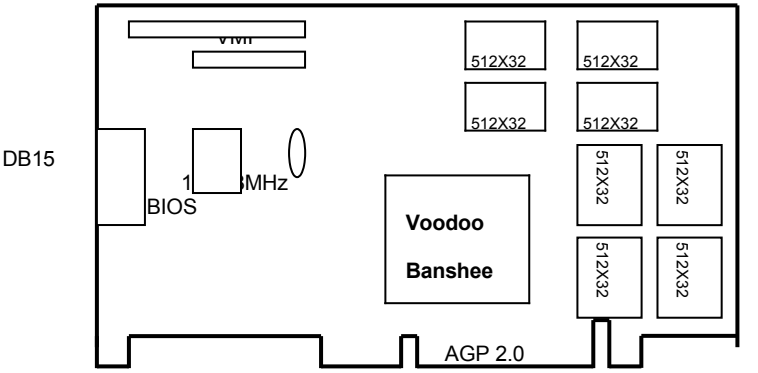
3D Acceleration
- Full hardware setup of triangle parameters
- 16-bit integer and floating-point Z-buffering with biasing
- Transparency and chroma-key with dedicated color mask
- Alpha blending on source and destination pixels
- Sub-pixel and sub-texel correction to 0.4x0.4 resolution
- 24-bit color dithering to native 16-bit RGB
- Per-pixel atmospheric fog with programmable fog zones
- Polygon edge anti-aliasing
- Perspective correct (true divide-per-pixel) 3D texture mapping
- True per-pixel, LOD MIP mapping with biasing and clamping
- High performance bilinear and trilinear filtering
- RGB modulation/addition/blending combines textures and shaded pixels
- Texture compositing for multi-texture special effects
- Support for 14 texture map formats
- 8-bit paletted textures with full bilinear filtering
- Texture compression through narrow-channel YAB format

Video Acceleration
- Multiple video window support
- Bilinear horizontal and vertical filtering
- YUV 4:2:2, and YUV 4:2:0 planar support

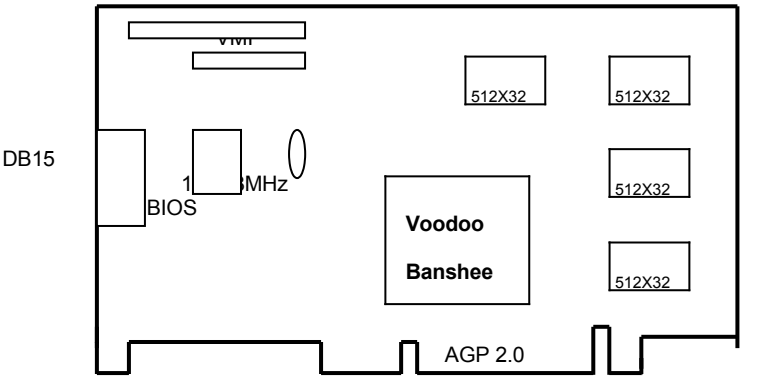
Host Interface
- High performance AGP interface including optimized support for sideband addressing and pipelining
- FIFO optimized for high speed bursting of geometry and texture data
- Optimized for Pentium II IO architecture

Memory System
- Advanced architecture with 1.6 GB/sec memory bandwidth
- Support 8/16 MB SGRAM Frame buffer
- Software support Windows95/98 & NT4.0

1.1 Voodoo Banshee Board Outline
SP3800 using SGRAM
16MB on board, board size: 161 x 108 mm.



SP3800C using SGRAM
16MB on board, board size: 151 x 88 mm. (another 4 pieces SGRAM on solder side)



2. S3 Savage 3D(391) Features:

- BUS TYPE: 64bit AGP 2X Side bands 133MHz BUS
- CHIP SET: S3 Savage 3D
- Memory Size: 8MB SGRAM / SDRAM

2D / 3D Graphics Accelerator

- Enhanced 128 bit Graphics Engine.
- Integrated 250MHZ RAMDAC, supports resolutions and refresh rates up to 1600 x 1200 (85HZ)
- Leading 3D Performance with the highest image quality.
- Triangle setup engine delivers 5M triangles / sec
- Peak performance rates of 125M pixels / sec with all features enabled

Complete 3D feature set

- Triangle Setup Engine.
- Single pass tri-linear Filtering
- S3 Texture Compression
- True Color Rendering
- Void & Cluster Dithering
- Spectlar & Diffuse Shading
- Alpha Blending
- 16/24 bit Z buffering
- Vertex and Table Fog
- MPEG-2 Video Textures
- Palletized Textures
- 8KB Texture Cache
- Edge Anti-Alisaing
- Perspective Correction
- Alpha Test
- Multiple Textures
- Procedural Morphing
- Texture Morphing
- Reflection Mapping
- Shadows

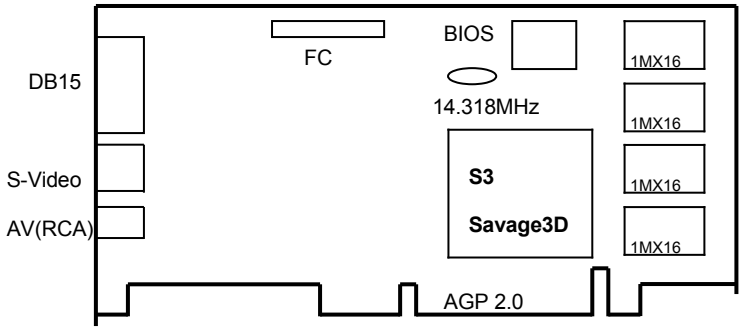
Optimized S/W DVD Solution(Optional)

- Mpeg-2 acceleration features reduce CPU utilization and provide high frame rates.
- Motion Compensation
- Sub-picture blending and highlights
- Planar to Packed Conversion
- Support image quality
- Filtered down scaling of host data

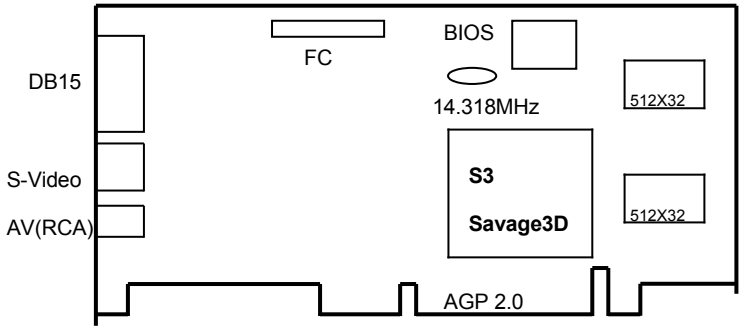
Complete Video Feature Set

- YUV Planar to Packed Format Conversion
- HW Sub-picture Blending and Highlights
- Motion Compensation
- Front-end Scalar with high quality Downscaling
- Advanced Pixel Formatter for Multiple Video Windows
- Advanced Streams Processor with Enhanced Scaling Algorithm
- Bus Mastering of IDCT Data for SW DVD Playback
- De-Interlacing Filter for Bob & Weave.
- Independent Color Adjustment
- 3-tap Programmable Flicker Filter & Vertical Overscan Compensation
- Integrated NTSC/PAL Encoder with S-Video, AV connector Support

2.1 S3 Savage3D Board Outline
SP391ESD using SDRAM
8MB on board, Board size: 160 x 83 mm.



SP391ESG using SGRAM
8MB on board, Board size: 160 x 83 mm. (another 2 pieces SGRAM on solder side)



3. Hardware Installation

3.1 Package Contents

1. Voodoo Banshee or S3 Savage3D Accelerator card.
2. CD title or Software diskettes
3. This manual.

3.2 Installing the Card

1. Turn off your computer.
2. Remove the cover of the computer per the owner's manual.
3. Install the card in the AGP bus slots.
4. Replace the cover.

3.3 Resolutions and colors supported:

3.3.1Voodoo Banshee

Voodoo Banshee with 16MB are fully compatible VGA with the addition of Hi-Color and True Color modes depending on the amount of video memory stalled. The amount of memory needed to display various resolutions is shown below.

Voodoo Banshee

Resolution & Colors	BPP	Refresh Rate (HZ)
640x480-256c	8	60/75/85/100/120
640x480-64Kc	16	60/75/85/100/120
640x480-16Mc	24	60/75/85/100/120
640x480-16Mc	32	60/75/85/100/120
800x600-256c	8	60/75/85/100
800x600-64Kc	16	60/75/85/100
800x600-16Mc	24	60/75/85/100
800x600-16Mc	32	60/75/85/100
1024x768-256c	8	60/70/75
1024x768-64Kc	16	60/70/75
1024x768-16Mc	24	60/70/75
1024x768-16Mc	32	60/70/75
1280x1024-256c	8	60
1280x1024-64Kc	16	60
1280x1024-16Mc	24	60
1280x1024-16Mc	32	60

3.3.2 S3 Savage 3D (391)

S3 Savage3D AGP bus VGA cards are fully compatible VGA with the addition of Hi-Color and True Color modes depending on the amount of video memory stalled. The amount of memory needed to display various resolutions is shown below.

S3 Savage3D

Resolution & Colors	BPP	Refresh Rate (HZ)	8MB
640x480-256c	8	60/72/75/85	✓
640x480-64Kc	16	60/72/75/85	✓
640x480-True	32	60/72/75/85	✓
720x576-256c	8	60/72/75	✓
720x576-64Kc	16	60/72/75	✓
720x576-True	32	60/72/75	✓
800x600-256c	8	56/60/72/75/85	✓
800x600-64Kc	16	56/60/72/75/85	✓
800x600-True	32	56/60//72/75/85	✓
1024x768-256c	8	60/70/75/85	✓
1024x768-64Kc	16	60/70/75/85	✓
1024x768-True	32	60/70/75/85	✓
1280x1024-256c	8	60	✓
1280x1024-64Kc	16	60	✓
1280x1024-True	32	60	✓

((I):interlaced ✓:Support x: Not Support)

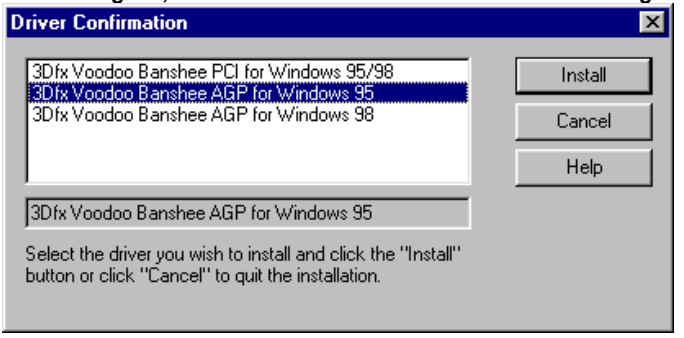
4. Smart Installation
For Windows 95 OSR2, Windows 98, WindowsNT4.0 SP3

4.1 Put the DRIVERS CD in your CD-ROM

4.2 Click the **Driver installation**

4.3 If everything fine, screen will show **Confirm Installation** window.
Then Select the **OK**

4.4 Now appears the **Driver Confirmation** window
Select the **Install**
(Here the picture shows Voodoo Banshee for example, if your are using S3 Savage3D, Driver Confirmation window will show S3 Savage drivers)



4.5 Then restart your computer.

5. Manually install Windows 95 & Windows 98 drivers

5.1 Installation and Setup

5.1.1 Windows95

The Windows setup program installs and modifies all of the necessary files. Follow these steps to install the Windows 95 drivers.

- Insert the DISC (CD Title Driver).
- Select **Control Panel** from **My Computer** group.
- Select the **Display** icon
- Double-click on the **Display** icon in the Setting -> **Control Panel** folder. You can also click the right mouse button anywhere on the desktop and select the Properties option form the pop-out menu.
- Click the **Settings** tab.
- Click the **change** Display Type button.
- Click the **Have Disk** button.
- Change directories and Select **banshee.inf**.(s3savage.inf)
  Disc (CD Title) is **E:\drivers\3dfx\3800\WIN95 (E:\dreivers\s3\391\win95)**

Note: "E:"→CD Drive **"3800"→**VGA model name

- Select AGP driver form the list and click the **OK** button. If a message stating that one or more driver files is older than the files on the system respond **YES** to overwrite the files.
- Click the Close button and Apply button, and restart your computer.

5.1.2 Windows98

The Windows setup program installs and modifies all of the necessary files. Follow these steps to install the Windows 98 drivers.

- Insert the DISC (CD Title Driver).
- Select **Control Panel** from **My Computer** group.
- Select the **Display** icon
- Double-click on the **Display** icon in the Setting -> **Control Panel** folder. You can also click the right mouse button anywhere on the desktop and select the Properties option form the pop-out menu.
- Click the **Settings** tab.
- Then show **[Unknown Device.] Properties** tab
  Select **Adapter**
- Then show **Standard PCI Graphics….** tab
  Select **Change**
- Then show **Update Device ….** tab
  Select **Next**
- Then show **Update Device ….** tab
  Select **Search for a better……**
  Then select **Next.**
- Then show **Update Device ….** tab
  If the **Specify a location** is wrong
  Please select **Brows**
- Then show **Browse for Folder** tab
  Select **E:\drivers\3dfx\3800\win98 (E:\drivers\s3\391\win98)**
  Disc (CD Title) is **E:\drivers\3dfx\3800\WIN95 (E:\dreivers\s3\391\win95)**

Note: "E:"→CD Drive **"3800"→**VGA model name

Then select **OK**

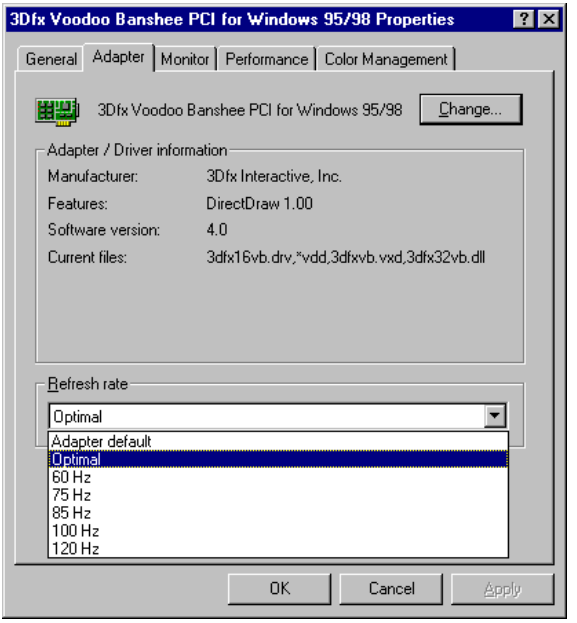
- Then show **Update Device Driver Wizard** tab
  Select **CD-ROM driver**
  Click the **Specify a locator,** if right
  Then select **Next**
- Then show **Update Device Driver Wizard** tab
  Select **Next**
- Then show **Update Device Driver Wizard** tab
  Select **Finish**
- Then show **System Settings Change** tab
  Select **OK**

5.2 How to Change Color Depth and Resolution

1. Make sure that you have installed windows95/98 Driver.
2. Click on the **Start** box in the lower left corner and proceed to **Control Panel**.
3. Inside the **Control panel** group , click on **Display** icon to open the **Display Properties** folder and select the **Setting table**
4. Click on the pull-down arrow from the **Color** palette area to select color depth or adjust the sliding bar to either **Less** or **More** from the **Desktop area**
5. Select **OK** to restart **WINDOWS95** and new color depth or the new resolution takes effect.

5.3 How to Change Refresh Rate

1. Make sure that you have installed windows95/98 Driver. Click on the **Start** box in the lower left corner and proceed to Setting, **Control Panel**
2. Inside the **Control panel** group , click on **Display** icon to open the **Display Properties** folder and select the **S3 Refresh table**
3. Click on the **Change Configuration** to change refresh rate
4. Select **OK** and new refresh rate takes effect



- Here the picture shows Voodoo Banshee for example.
- Refresh Rate default is Optimal.
- If you change Refresh Rate from Optimal to another , you must be to restart WINDOWS 95
- **Be sure your monitor can support DDC functions(or it is Plug & Play monitor), otherwise you can not select refresh rate.**

6. Windows NT 4.0

The following steps describe how to install Windows NT4.0 display drivers

1. Select **Control Panel** from the **Main** group.
2. Select the **Display** icon.
3. Select C**hange Display Type**.
4. Select Change from the **Adapter Type** area.
5. Select **Other**.
6. Place the Disc (CD Title) into Driver. Click **OK**.
7. Select I**nstall** and click "**YES**" when the Installing Driver dialog box appears.
8. When the Windows NT **Setup** dialog box appears select CDROM, and click "**Continue**".

A message appears stating that drivers were successfully installed. Click **OK**. Another message appears stating that the driver could not be restarted dynamically. Restart **Windows NT** to run the new driver. Click **OK.**

FCC Statement

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

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

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

Notice:
(1) An Unshielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord by used.
(2) Use only shielded cables to connect I/O devices to this equipment.3
(3) Changes or modifications not expressly approved by the party responsible for compliance could void the use's authority to operate the equipment.

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