Crux390 AGP

On-line User's Manual

☀ Introduction:

Based on the S3's Savage3D™ accelerator, **Crux390 AGP** focused on setting a new standard for 2D, 3D and DVD/video acceleration. Delivering the industry's highest 3D quality and performance, the 128-bit Savage3D accelerator achieves an unprecedented 125 M-pixels per second through its single cycle trilinear architecture; and delivers more than 4x AGP performance through its newly designed AGP engine and Microsoft-endorsed texture compression technology.

Savage3D is the first 3D accelerator to include S3TC™, which was selected by Microsoft as the standard compression technique in DirectX (r). By compressing data up to 1/6 the normally required space, S3TC enables Savage3D to deliver 4X AGP performance and essentially doubles the chip's frame buffer size by allowing more textures to be stored.

If you need more information, please refer to the chapter - Feature List.

✳ How to Use this Manual

✳ FCC Information

✳ Crux390 AGP Layout

✳ Crux390 AGP Feature List

✸<u>Installing Crux390 AGP Hardware</u>

✸<u>Crux390 AGP Software List</u>

✸<u>Installing Crux390 AGP Software</u>

✸<u>Using Crux390 AGP Software</u>

✸<u>3D Dictionary</u>

EUT:VGA Card

FCC ID:I27MM-VS21A

Biostar Group

USER'S MANUAL

FEDERAL COMMUNICATIONS COMMISSION

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.

NOTE

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. This equipment generates, uses and can radiated 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 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 o relocate the receiving antenna.
-Increase the separation between the equipment and receiver.
-Connect the equipment into 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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

I

FCC Information

Note: 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 and 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 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 the receiving antenna.

* Increase the separation between the equipment and receiver.

* Connect the equipment into 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.

This device complies with Part 15 of 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.

Notice to user: Changes or modifications to this product not approved by the party responsible for FCC compliance could void your authority to operate this equipment.

In order for an installation of this product to maintain compliance with the limits for a Class B device, shielded cables must be used for the connection of any devices external to this product.

How to Read Your On-line Manual

On-line Manual gives you all the product and information about our products. On-line User's Manual is written using HTML (Hypertext Markup Language). When you need the help, you just need to do a few clicks in the On-line Manual.

In order to make On-Line Manual more convenient for users, we would like to provide some hints as follows for using On-Line Manual.

● On-line User's Manual is written using HTML (Hypertext Markup Language). This is the same language used to create Home Page for the World Wide Web. As a result, On-line User's Guides behave just like a Home Page.

● Please click any hyper link that interests you. This includes hyper links to subject pages and hyper links to definitions of individual words.

● Make use of the Table of Contents to help you find the subject you are looking for. The Table of Contents will always be the first page of your on-line manual file.

● Microsoft Internet Explorer is the preferred choice for viewing your On-Line User's Manual.

Crux390 AGP **Layout**

Layout
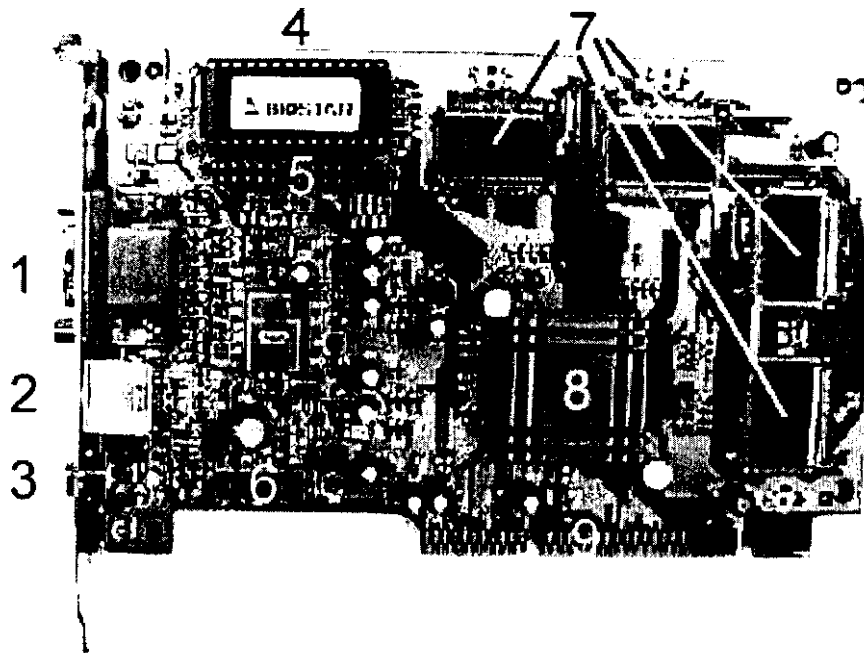
1. Standard 15 pin VGA to monitor connector.
2. S-VIDEO TV OUTPUT.
3. COMPOSITE-VIDEO TV OUTPUT.
4. BIOS used to control the board.
5. Video Interface Port.
6. Video Interface Port.
7. SDRAM\SGRAM for maximum performance.
8. S3 Savage3D chip.
9. Standard AGP Interface.

Crux390 AGP Feature List

High Performance 3D/2D/Video Accelerator

- New Single Cycle 3D Architecture
- 5M triangles/second Triangle Setup Engine
- 128-bit Dual Rendering Pipeline
- 125M pixels/sec Trilinear Fill Rate
- Full AGP 2X Implementation including Sideband Addressing and AGP Execute Mode

3D Rendering Features

- Single Cycle Trilinear Filtering
- S3® Texture Compression
- True Color Rendering
- Void and Cluster Dithering for 16-bit Modes
- Specular Lighting and Diffuse Shading
- Alpha Blending Modes
- MPEG-2 Video Textures
- Edge Anti-Aliasing
- Vertex and Table Fog
- 16- or 24-bit Z-buffering
- Sprite Anti-Aliasing, Reflection and Environment Mapping, Texture Morphing, Shadows, Procedural Textures, and Atmospheric Effects

2D Acceleration Features

- Highly Optimized 128 bit Graphics Engine
- Full Featured 2D Engine for acceleration of Bitblt, Rectangle Fill, Line Draw, Polygon Fill, Panning/Scolling and HW Cursor
- 8, 16, and 32 bpp Mode Acceleration

High Speed Memory Interface

- 125MHz SDR SGRAM with Block Write
- 64-bit Synchronous Memory Bus
- 2-, 4-, or 8MB Frame Buffer
- SDRAM for cost savings
- SO-DIMM Memory Upgrade
- 512Kx32 or 256Kx32 Memory Parts

Motion Video Architecture

- High Quality Up/Down Scalar
- Motion Compensation
- Subpicture Blending and Highlights
- Optimized Software DVD Decoders
- Streams Processor™ for on-the-fly stretching and blending of multiple video streams
- Multiple Video Windows
- Brightness, Hue, and Saturation Controls
- 60MHz VIP Video Port allows HDTV Resolutions
- Glueless Interface for HW MPEG-2 Decoders and Video Digitizers

High Quality TV Out

- Integrated NTSC/PAL Encoder
- Optional Macrovision® 7.1 Support
- Programmable 3-tap Flicker Filter
- Vertical Overscan Compensation
- Simultaneous CRT and TV Display

Full Software Support

- WHQL Certified Drivers
- Windows® 95 and 98 Display Drivers
- Windows NT 3.5, 4.0, and 5.0 Display Drivers
- Windows 3.X and OS/2® 2.1/3.0 Display Drivers
- Direct3D™, DirectDraw™, and DirectVideo™
- OpenGL™ ICD for Windows 9X and NT
- Comprehensive SDK, Utilities and ISV Tools
- ISV Marketing and Bundling Programs

Additional Features

- 33MHz PCI 2.1 Bus Support
- Flash ROM and I2 C Serial Communications Bus
- 250MHz RAMDAC with Gamma Correction
- PCI Power Management
- DDC Monitor Communications
- 256-pin, 27x27mm PBGA

Product Description

Savage3D™ brings high performance 3D graphics to the mainstream PC by integrating 2D acceleration, MPEG-2 video acceleration, and leading edge 3D performance into a cost effective package. Savage3D provides the solution for the high performance consumer, corporate desktop user and entry level professional.

Featuring a high performance 128-bit engine, Savage3D delivers a new single cycle architecture which provides leading edge performance along with the highest image

quality.

The single cycle trilinear filtering enables the highest 3D graphics performance along with stunning image quality. Savage3D is the first 3D accelerator to utilize S3TC, which was endorsed by Microsoft as the standard compression technique in DirectX. The high quality texture compression enables 6X the amount of texture storage and AGP bus bandwidth. Savage3D produces the most vivid and realistic images through its true color rendering, which enables the use of 16 million colors vs. the traditional 64K. Savage3D architecture is optimized for full AGP 2X implementations and high performance AGP Texturing.

New Triangle Setup Engine
The advanced triangle setup engine provides industry-leading 3D performance for realistic user experience in games and other interactive 3D applications. The new 3D engine is designed for AGP texturing from system memory and provides peak performance with many 3D features enabled, such as trilinear filtering, specular and diffuse shading, perspective correction, and fogging. This powerful 3D accelerator moves the market to support more complex games and interactive 3D applications.

128-bit 2D Graphics Engine
The state of the art 128-bit 2D graphics engine delivers high speed 2D acceleration for productivity applications and wins benchmarks for desktop PCs. This full featured 2D engine provides acceleration in many color depths.

DVD Playback and Video Conferencing
Savage3D provides the ideal architecture for high quality MPEG-2 playback for interactive DVD applications and video conferencing. The video accelerator off loads the CPU by performing the planar to packed format conversion and motion compensation tasks. The enhanced scaling algorithm delivers incredible full screen video playback. The multiple video windows and image mirroring provides the ideal solution for video conferencing. The 60MHz VIP video port allows low cost connection to industry-standard MPEG-2 decoders and video digitizers.

S3 Streams Processor Technology
The proprietary S3 streams processor technology provides stretching, filtering and YUV color space conversion required for full screen video playback with both software CODECs and hardware MPEG sources. It allows simultaneous display of graphics and video of different color depths as well as vertical interpolation and color controls for high quality video playback.

TV Output Support
The integrated TV out capabilities set new quality standards for flicker reduction, filtered overscan compensation, and NTSC/PAL encoding. The integrated encoder with Macrovision® support enables TV outputs of composite or S-video signals, providing flexibility for desktop computers. The programmable 3-tap flicker filter as well as vertical overscan compensation ensure excellent TV output quality.

High Screen Resolution (Non-interlaced) Support

	Frame Buffer Size		
Resolutions Supported	2 MB	4 MB	8 MB
640x480x8/16/32	x	x	x
800x600x8/16/32	x	x	x
1024x768x8/16	x	x	x
1024x768x32		x	x
1280x1024x8	x	x	x
1280x1024x16		x	x
1280x1024x32			x
1600x1200x8	x	x	x
1600x1200x16		x	x
1600x1200x32			x

Installing *Crux390 AGP* Hardware

- With the power off, remove your computer cover. Find the AGP slot and remo
  the bracket and screw. (Remember which cables go to which connectors. You may v
  to label your computer's cables before disconnecting them!)

✴Install Crux390 AGP Card into your system:
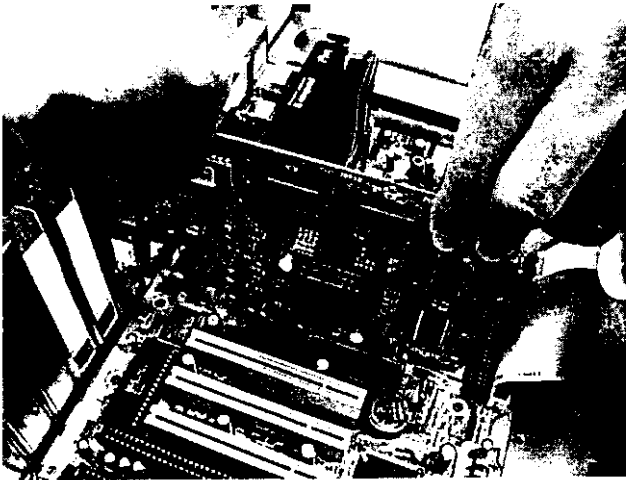
Insert Crux390 AGP Card firmly into AGP
Care should be taken to press it evenly ar
snugly into its slot. Once you are certain
Crux390 AGP Card is installed properly in
slot, secure it with a screw.
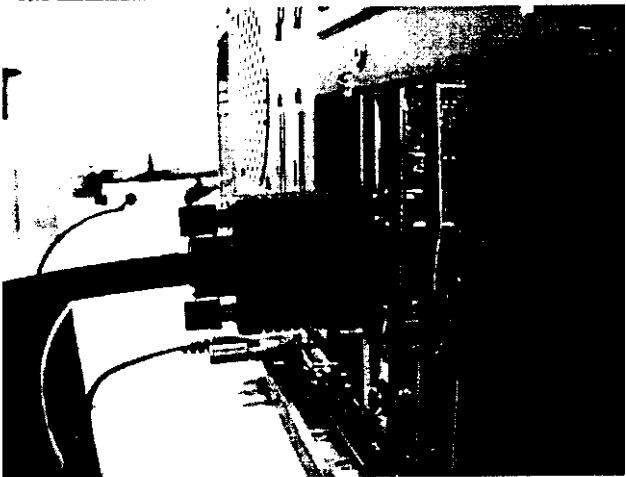
Connect the monitor port on Crux390AGF
your monitor with a standard monitor cabl

- Secure your computer cover and attach any previously removed cables.
- Use Crux390 AGP to play the latest and greatest 3D games. Enjoy it!

Software List

● Drivers

Category	Version	Platform
Display drivers	4.10.02.4002-6.10.07	Win95/98
Display drivers	4.1024.600.0012	WinNT 4.0

● Applications

Name	Version	Location in CD	Platform
CyberLink VCD PowerPlayer	3.48	\Pwplayer	Win95/98

Installing *Crux390 AGP* Software

Important Note: Recommended installation orders under Windows 95(OSR2)/98:

1. If your mainboard, with AGP support, is not using Intel chipset and is one of following chip venders, You MUST install the AGP Driver provided by these thirty-party venders to enable the AGP feature.

    a. VIA

    b. ALI

    c. SIS

2. Run **USBSUPP.EXE** (4.03.1212 or above) to upgrade system to Windows 95 OSR2.1. This file will patch Windows kernel to apply to the new AGP standard. (Only needed by Windows 95 OSR2)

3. Crux390 AGP Windows 95/98 Drivers

4. Microsoft DirectX

5. Others (3D Games...)

You can use CD installation wizard, CD Installation Utility (**SETUP.EXE**), located in the root of CD to install some usually used drivers conveniently.

Welcome

Congratulations!

Thanks for purchasing a high quality product from BIOSTAR.

BIOSTAR GROUP

Ver 2.0
1998/08/17

Go to next page.

You can simply put CD into CD-ROM drive and the Installation Utility will autorun or you can run the CD Installation Utility directly, then use mouse cursor to click the proper option on the page. Utility will invoke other applications to complete the rest of installation.
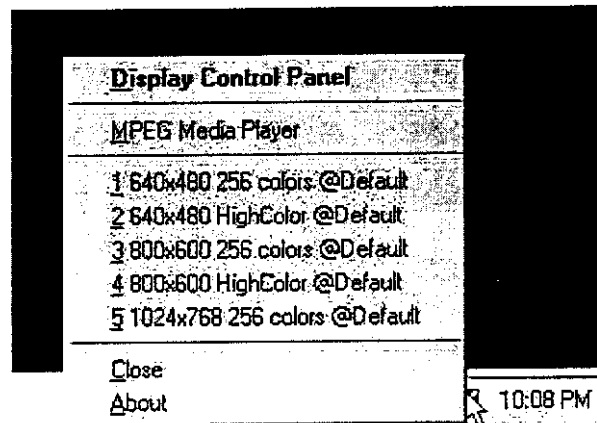
Using Software

1.Invoke the Display Control Panel:

Start ••• ⚡ 3:45 PM

Display control panel notification icon

Move mouse cursor to the little icon located on the right side of Windows 95/98 Taskbar, and right-click it.

```
Display Control Panel
MPEG Media Player

1 640x480 256 colors @Default
2 640x480 HighColor @Default
3 800x600 256 colors @Default
4 800x600 HighColor @Default
5 1024x768 256 colors @Default

Close
About                        10:08 PM
```

Select the Display Control Panel option on the pop-up menu to invoke Display Control Panel. On the other hand, you also can invoke MPEG Media Player and quickly switch the display mode.

2.Display Control Panel - **Desktop** (Page 1):
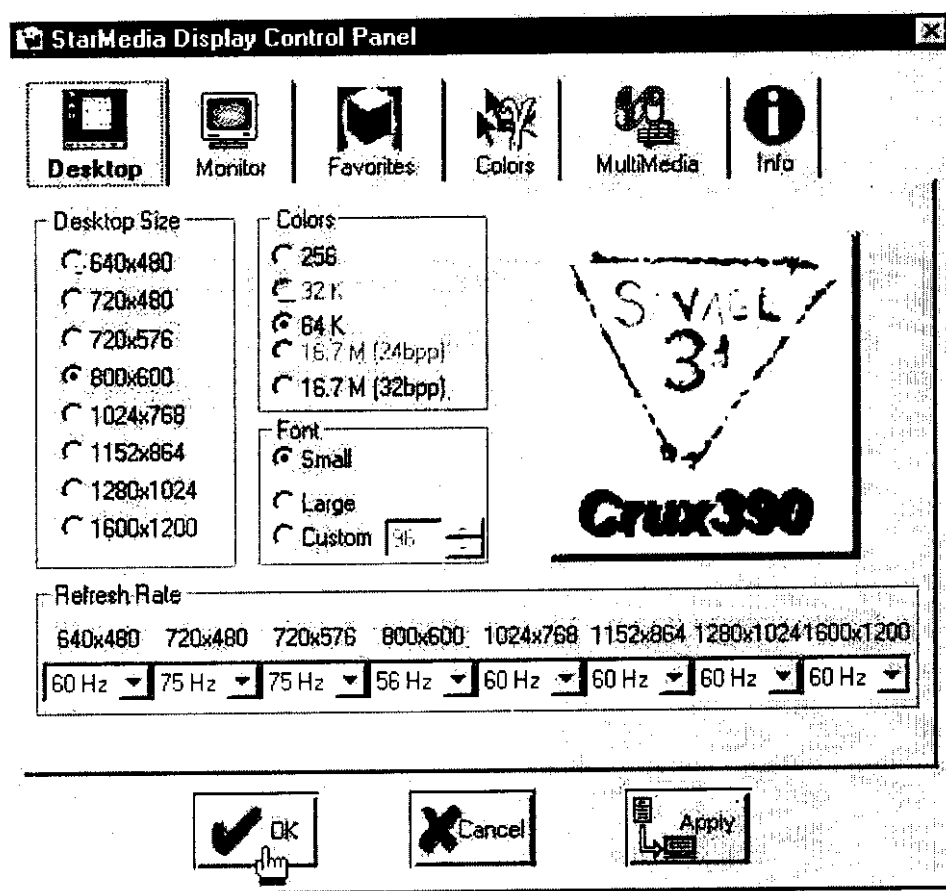
The Desktop dialog allows you to configure your desktop size, color depth, font size and refresh rate.

Desktop Size:

> The desktop size option allows you to select a desktop resolution.

Colors:

> Available color options depend on desktop size and installed memory, and determine the number of colors that can be displayed on screen.

Font:
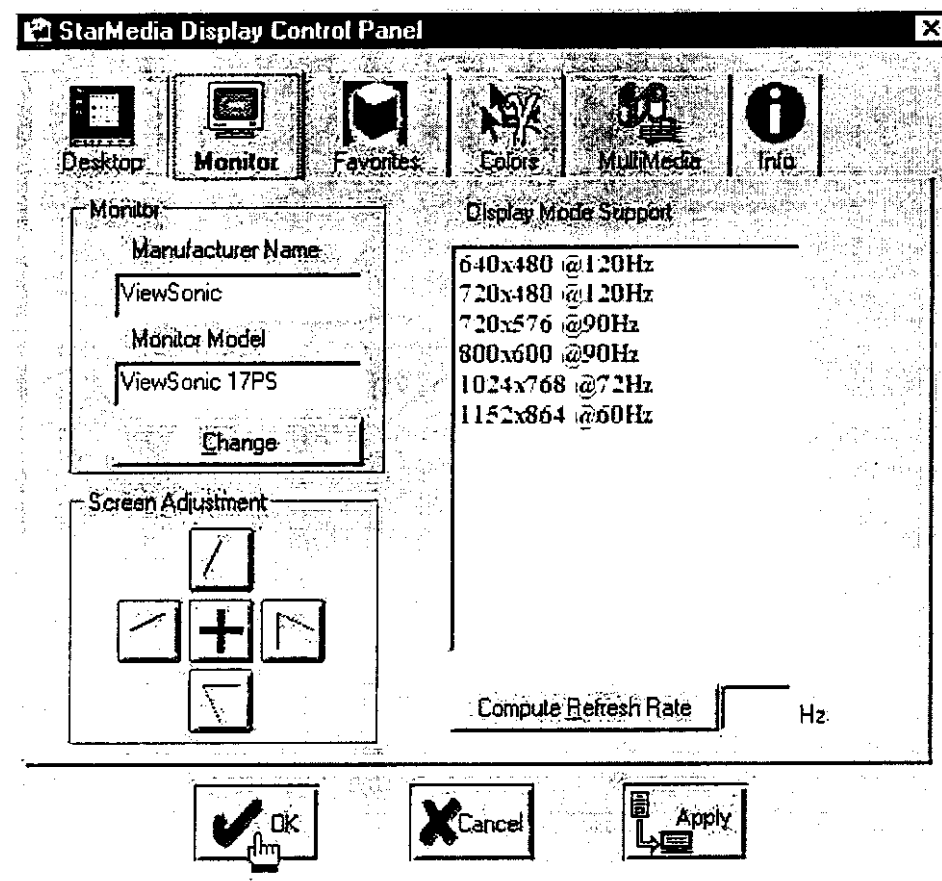
> This option allows you to select the font size Windows will use for system menus and resources.

Refresh Rate:

> These options allow you to adjust refresh rate settings for

each display mode. Faster refresh rates are less likely to
cause eye fatigue due to screen flicker.

3. Display Control Panel - **Monitor** (Page 2):

StarMedia Display Control Panel					
Desktop	Monitor	Favorites	Colors	MultiMedia	Info

Monitor

Manufacturer Name

ViewSonic

Monitor Model

ViewSonic 17PS

Change

Screen Adjustment

Display Mode Support

```
640x480  @120Hz
720x480  @120Hz
720x576  @90Hz
800x600  @90Hz
1024x768 @72Hz
1152x864 @60Hz
```

Compute Refresh Rate   Hz

✔ OK   ✗ Cancel   Apply

Detect DDC monitor or select monitor type, Screen adjustment and compute the real refresh rate.

DDC detection or Change monitor type:

Pressing this button will detect your monitor to see if it supports the Plug & Play facility. If it does, the manufacturer of your monitor and the display modes which your monitor supports will be shown; If your monitor does not support PnP, then you have a option to select the monitor type manually.

Compute Refresh Rate:

When you click on the Compute Refresh button, StarMedia will attempt to determine the current refresh rate of your monitor in Hz.

Screen Adjustment:

The Screen Adjustment buttons allow you to adjust screen position. Using the arrow bitmap buttons for up, down, left and right adjustment The **cross (+) bitmap button on the center will restore the screen to its original position.**
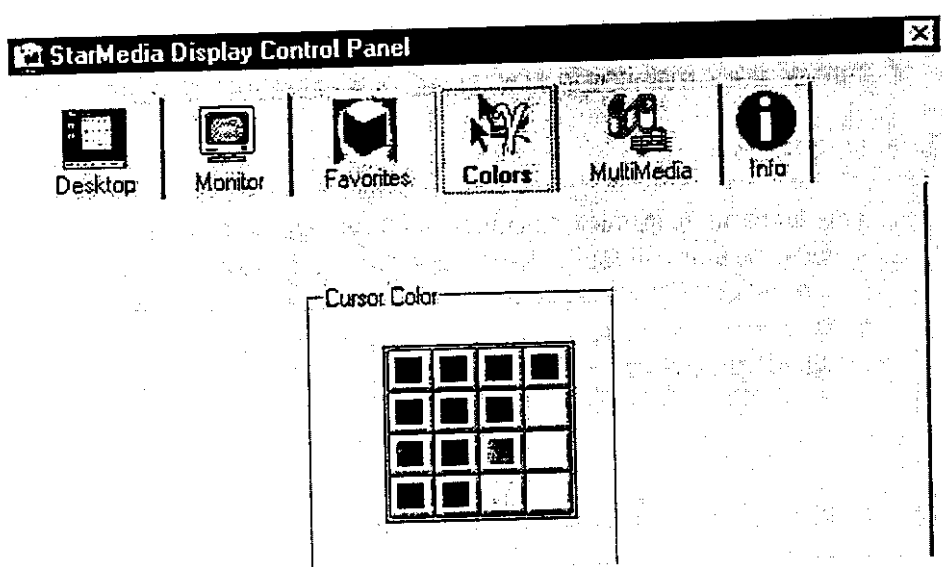
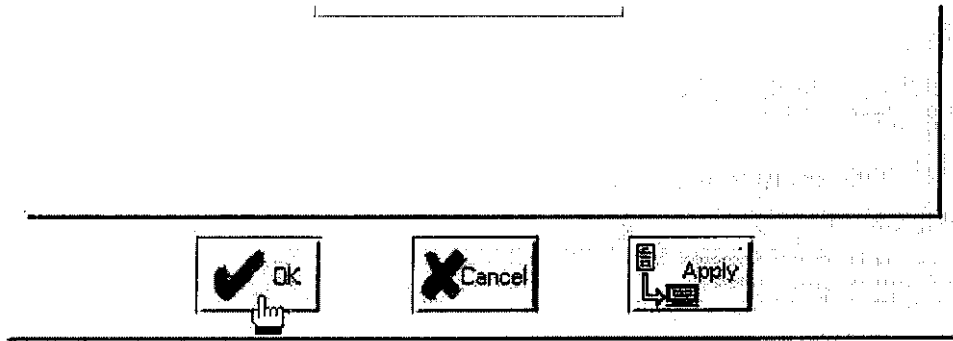4.Display Control Panel - **Favorites** (Page 3):
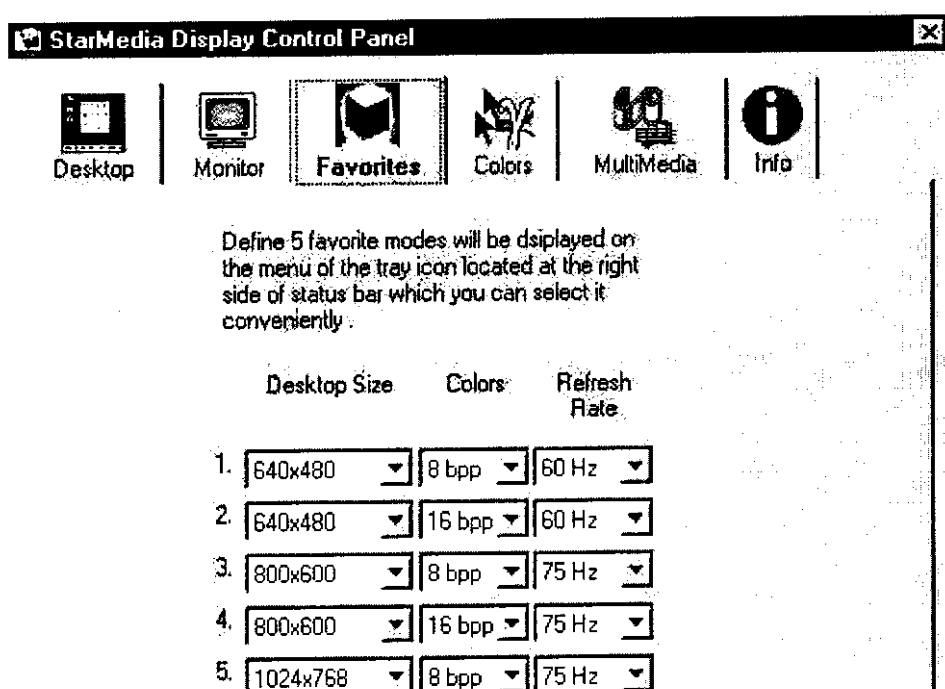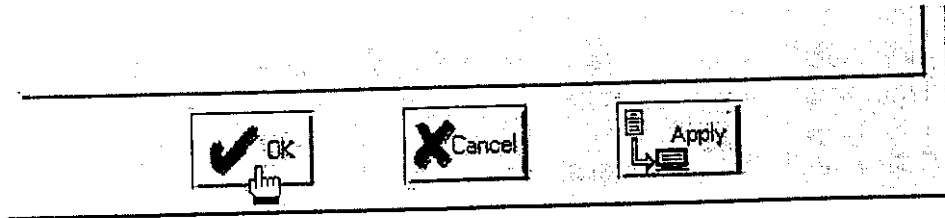
The Favorite page shows the five modes which you may frequently use. Define 5 modes by clicking the combo boxes for desktop size, color-depth, and refresh rates. The 5 favorites mode you set will display by clicking on the notification icon.
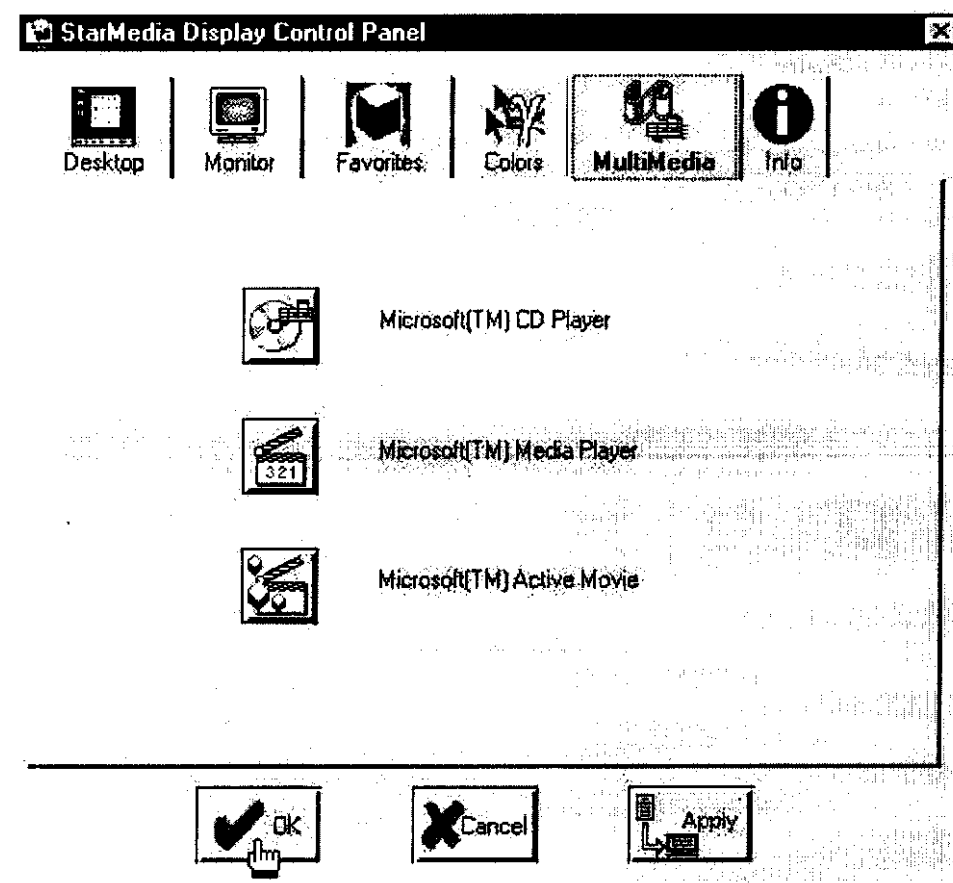
5.Display Control Panel - **Colors** (Page 4):

The Cursor dialog allows you to change the cursor color. There are 16 cursor colors you can choose.

6.Display Control Panel - **MultiMedia** (Page 5):

The MultiMedia page shows 3 buttons which will launch Microsoft (TM) CD player, Media Player, and Active Movie respectively. Sometimes some of the buttons will be grayed when the specific program(s) is not installed on your computer.

CD Player:

CD music playback.

This control lets you play an audio compact disc.

It has functions such as playing, pausing and resuming a CD, playing tracks in random order, and playing multiple discs.
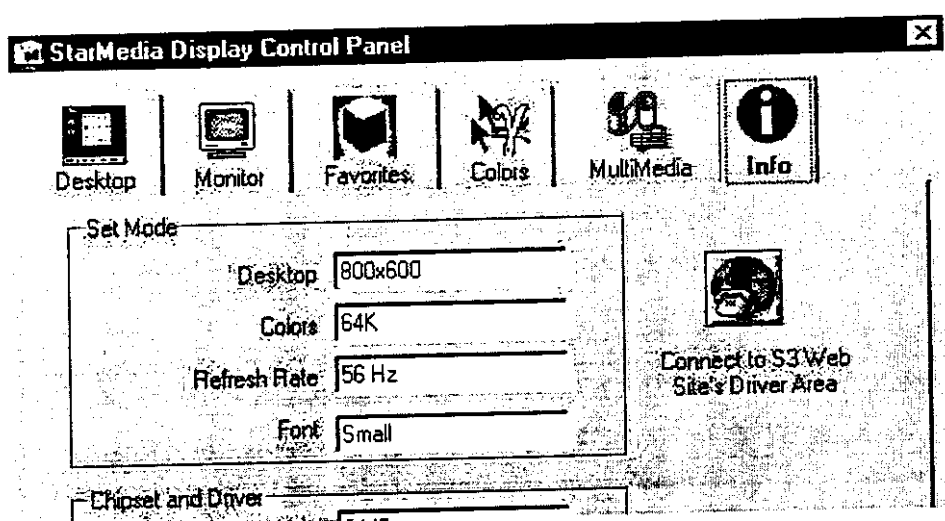
Media Player:

Video and audio file playback.

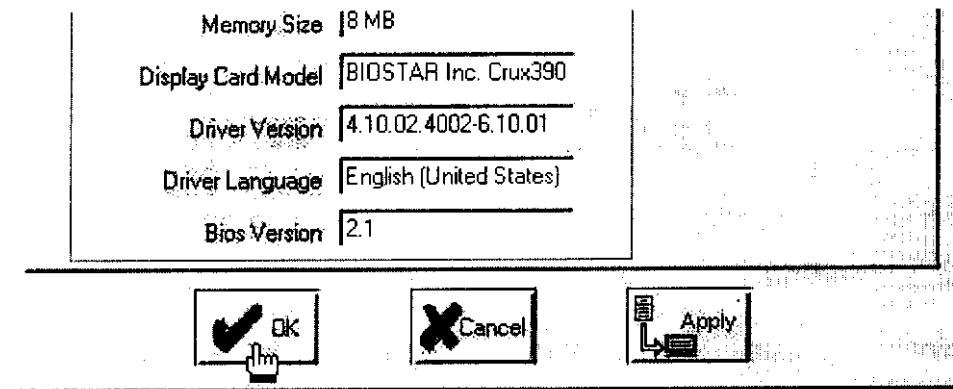This control lets you play audio, video, and animation files. It has functions such as playing, rewinding, and fast-forwarding a multimedia file.

Active Movie:

Movie, video, and audio file playback. This control lets you play a MPEG file, a video CD(DAT file), Quick Time (QT file) or a movie file(MOV file).

7.Display Control Panel - **Info** (Page 6):

Memory Size	8 MB
Display Card Model	BIOSTAR Inc. Crux390
Driver Version	4.10.02.4002-6.10.01
Driver Language	English (United States)
Bios Version	2.1

OK	Cancel	Apply

This window shows the resolution, color-depth, font size, and refresh rate for the current desktop setting, the graphic chipset, the versions of the BIOS and Windows driver, and also the total video memory size on your graphic card.

3D Dictionary

➡ Alpha blending

Combining two images with different transparency levels so that one image appears visible through the other. An object's transparency is defined as its Alpha value or Alpha level.

➡ Anti-aliasing

The removal of artifacts from an image.

➡ Bi-linear sampling/filtering

A combination of four colors in a single 3D image used +to improve that image's resolution.

➡ Clipping

Removal of any image displayed outside of a predefined shape.

➡ Compressed Textures Depth cueing

Changing the color and brightness of a 3D image as it moves, relevant to the viewer. Color becomes less bright as the image moves away, brighter as it moves closer.

➡ Dithering

Substituting combinations of colors you do have for colors that you don't. For example, if your computer is only capable of displaying 256 colors and you load an image that use 65,000 colors, your computer will create substitutes for the colors you don't have by combining the colors that you do. The color quality of a dithered image is inferior to a non-dithered image.

➡ Double buffering

A way for your computer to work on an image two different ways at once. Before displaying an image, your video card calculates what a finished image will look like and displays that image while it is calculating the next image in a video stream. Double-buffering affords smoother playback for video or any other multiple-frame file format.

➡ Frames Per Second (FPS)

A measurement of how often information in a video or animation file is updated on your screen or how many frames of motion you see in a given second. Movies and television shows are shown at 24fps.

➡ Photo mapping

Overlaying a photo image on a 3D object, so that the photo takes the shape of that object.

➡ Rasterization

Transformation of a 2D object into a 3D object.

➡ Ray tracing

One way of rendering a picture. The computer computes the path of a light ray from the light source to the objects (from which the ray reflects), and further to the observer. It does this for every pixel on the monitor. This is a very intensive calculation, but the results are worth it.

➡ Refraction

Bending of light when it passes through another substance.

➡ Rendering

Converting a graphics image into an array of pixel colors for the display.

➡ Shading (gouraud/phong)

Both shading methods make the surface and color of an object appear smoother. Phong shading takes more CPU time but gives better results. Gouraud shading is faster.

➡ Texture mapping

Overlaying a graphics image on a 3D object, so that the photo takes the shape of that object.

➡ Transparent/Translucent

An image that can partially be seen through.

➡ Tri-linear mip-mapping

The texture map is stored at several levels of detail in a structure called mip-map. You compute the texture coordinates and the exact level of detail. This gives you the two closest levels of detail available in the mip-map. In each one you perform a bilinear interpolation, and then a linear interpolation between the two levels (that's why it's called tri-linear). High-end graphics workstation (like SGI Reality Engine) use tri-linear mip-mapping.

➡ Tri-Strip processing Vertex

A point which marks the intersection of two or more edges of a polygon or other graphics object.

➡ Video mapping

The same as texture mapping. In the case of video mapping, the texture is applied to an animation or a video clip.

➡ Z-buffer

A two dimensional array made up of a grid of points on a sea-level plane, each containing the value of the depth (z) at that point. This way every pixel on the monitor has a "depth value" so that the program knows which polygons are in the foreground and which are in the background.