IBM

# POWER GXT6000P Graphics Accelerator

## Highlights

*Provides 3D graphics perform-
mance leadership as measured
by standard OpenGL bench-
marks when coupled with
RS/6000® workstations featur-
ing POWER3-II microprocessors*

*Includes breakthrough tech-
nology optimally tuned for
graphic-intensive applications,
including MCAD and MCAE*

*Increases the productivity
of designers and engineers
through graphics power and
performance that allows users
to work at their own pace*

*Enables industry-leading appli-
cation performance for mid-
range 3D graphics in a compact
footprint with the RS/6000 44P
Model 170 workstation*

*Supports enhanced graphics
functions, such as dual
textures, hardware occlusion
culling, 3D textures and off-
screen rendering*

*Offers popular features such as
full hardware geometry accel-
eration, multiple color maps and
up to 108MB of texture memory*

*Continues industrial-strength
design tradition with native
hardware support for both
OpenGL and graPHIGS APIs*

### In a class by itself
As specialized industries such as
aerospace and automotive endeavor
to remain competitive and get to market
faster, the design and analysis software
used continues to grow more complex,
adding new functions and demanding
more power.

The POWER GXT6000P Graphics
Accelerator brings a new class of func-
tion and performance to IBM UNIX®-
based workstations to meet those needs
with room to spare. It is designed to take
on large MCAD models, complex simula-
tions and the challenges of visualization
that are often encountered in the most
demanding applications.
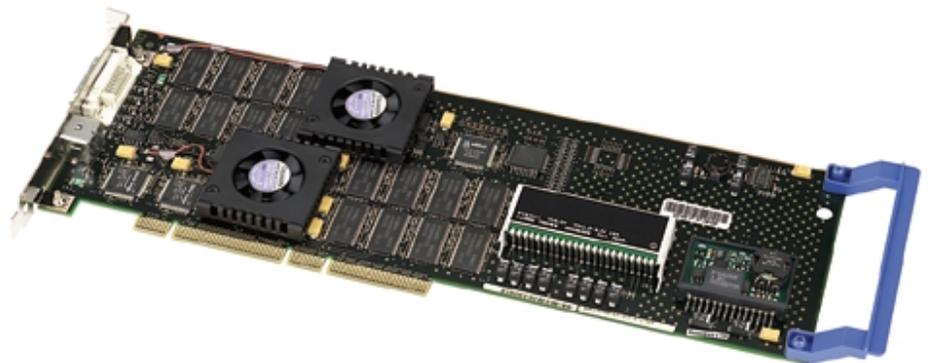
## Breakthrough technology

The GXT6000P is implemented with breakthrough technology. An IBM-designed single-chip, hardwired geometry accelerator (ASIC) provides support for functions such as lighting, texture transformations and clipping. Another IBM-designed ASIC, a single-chip raster engine, defines the pixel image using texture maps, alpha buffers, overlays, stencils, color maps and anti-aliasing. The result is a dazzling display of application data that is unmatched.

The hardware design of the GXT6000P provides native support for the primitives required by both the OpenGL application programming interface (API) and the IBM graPHIGS implementation of the PHIGS API. This means that, regardless of the API chosen by software developers to implement the graphics calls of a given application, native hardware support is available to implement the subroutine calls without any cumbersome translation libraries or software workarounds. Examples of specific API-oriented hardware include capabilities such as 3D textures and display list processing for OpenGL 1.2 and scissoring and multiple color tables for graPHIGS.

## Advanced functions

When configured as a part of the IBM 64-bit RS/6000 44P Model 170 workstation, the GXT6000P delivers the enhanced performance and advanced functions required by designers and engineers. The combination of the GXT6000P and RS/6000 44P Model 270 workstation, which supports a one- to four-way symmetric multiprocessor (SMP), can create an analysis workstation that is second to none. It offers the memory bandwidth and floating-point preformance that brings a new level of interactivity to MCAE, petroleum and scientific applications.

## Designed for performance

The advanced capabilities of the GXT6000P are the result of an innovative design. The PCI bus interface accepts a high transfer rate of graphics commands and data from the CPU, supporting a 64-bit PCI bus running at speeds up to 66 MHz.

The geometry processor is hardwired; it is not a DSP requiring microcode, nor is it a generic CPU running a program that processes geometry. It is a specifically designed chip with the circuits embedded to process the geometric transformations of graphic elements, including such functions as normal calculation, texture coordinate generation, lighting, clipping, fog factor generation and perspective division.

After the graphics objects are placed, transformed, lighted and clipped, they are passed on to the other IBM-designed ASIC for rasterization. At that time, blending, shading, texturing and the effects of lighting are calculated and/or interpolated and specified for each pixel.

## The elements of power

These individual elements are implemented as colored pixels into lightning-fast double-data rate SDRAM graphics memory, and then double-buffered to support the seamless appearance of movement on displays of resolution up to 1920 x 1200 pixels at a 76 Hz refresh rate, or 1600 x 1200 at 85 Hz. Advanced capabilities, such as P-buffers, which are used to buffer such rendered information as print requests, images used for texture maps, or storage space for 3D images for later blending into the frame buffer are also available to the software developer.

The GXT6000P frame buffer is a unified frame buffer, which provides the ability under software control to dynamically reconfigure the buffer to support various requirements. This allows the allocation of frame buffer memory to enhance a specific function, such as higher screen resolution, greater texture memory, P-buffer memory or double-buffered stereo in preference to another function.

The GXT6000P is the right choice for users requiring exceptional graphics performance and advanced function in the same graphics accelerator. Whether designing an airfoil or a front fender, or perhaps animating a fly-through of a fuselage or an oil field, the GXT6000P provides the graphics speed and advanced function required by the most demanding users.

## The IBM advantage

IBM graphics products are backed by our worldwide service and support. With our comprehensive array of products and services and unrivaled enterprise computing experience, IBM provides end-to-end support, including industry-leading hardware and software; installation, maintenance, consulting and implementation services; education and training and attractive financing.

## For more information

To learn more about the POWER GXT6000P Graphics Accelerator, contact your IBM representative, IBM Business Partner or visit the following Web sites:

- **ibm.com**/servers/unix
- **ibm.com**/rs6000/hardware/adapters/ graphics/
- **ibm.com**/ibmlink

| **Supported RS/6000 models** | • RS/6000 44P Models 170 and 270 |
|---|---|

**Hardware Specifics**

| **Slots needed** | • Single card – one slot |
|---|---|
| **Color support** | • 16.7 million concurrent colors, four independent hardware color maps |
| **Frame buffer** | • 128MB unified frame buffer with standard configuration as follows: |
| | – eight- or 24-bit double-buffered color |
| | – eight-bit double-buffered alpha |
| | – 24-bit Z-buffer |
| | – four-bit stencil planes |
| | – eight-bit overlay |
| | – eight-bit window ID |

| **Advanced 3D features supported in hardware** | • Advanced hardware geometry acceleration |
|---|---|
| | • Up to 108MB of texture memory |
| | • Gamma-corrected anti-aliased lines |
| | • Dual textures, 3D textures and texture color tables |
| | • Linear, bilinear and trilinear texture filtering |
| | • Hardware occlusion culling |
| | • Gouraud shading, depth cueing/fog, transparency |
| | • Four hardware color maps |
| | • Supports screen resolution up to 1920 x 1200 at 76 Hz |
| | • Double-buffered stereo viewing in a window (up to 1280 x 1024) |
| | • DDC2B support, ISO 9241 compliant |
| | • P-buffer support |

| **Software requirements** | • AIX® Version 4.3.3 |
|---|---|
| | • OpenGL and graPHIGS APIs are included with AIX |

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