Pentium® Processor Performance Brief

June 1997

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INTRODUCTION

The Intel Pentium® processor family provides outstanding performance for all PC Software. The Pentium processor family consists of the following products:

- **Pentium processor at 200 MHz**
- **Pentium processor at 166 MHz**
- **Pentium processor at 150 MHz**
- **Pentium processor at 133 MHz**
- **Pentium processor at 120 MHz**
- **Pentium processor at 100 MHz**
- **Pentium processor at 90 MHz**
- **Pentium processor at 75 MHz**
- **Pentium processor at 66 MHz**
- **Pentium processor at 60 MHz**

This report provides test results of common benchmarks for Intel Pentium processor-based systems beginning with the Pentium processor at 100 MHz. Details of the system configurations used in all the benchmarks throughout this brief are described in Appendix A.

Modern industry standard benchmarks were chosen to accurately demonstrate the superior performance of the Intel Pentium processor family. Processor-intensive benchmarks such as SPECint95* and several 32-bit benchmarks highlight workstation-level performance. SPECint95 is a very effective benchmark for evaluating CPU performance because of its large size and application representative instruction mix.Just as CPU benchmarks are appropriate for comparing processors, application benchmarks are the best method for overall system performance comparisons. Several popular Windows* software applications are used for this purpose.

As operating systems and applications have moved towards a 32-bit environment, they require system vendors and users to be cognizant of 32-bit workload performance. As such, most product planning and purchasing decisions are expected to be based on 32-bit benchmarks in order to ensure that these decisions are relevant for the entire life of a system. Intel is committed to using the most robust and relevant benchmarks in characterizing its products' performance and thus uses a mixture of both 32 and 16-bit metrics in this report. Over time, Intel will adapt this mix as newer benchmarks appear.

Robust benchmark programs should be representative of how well the actual applications will execute. However, performance is often the combined characteristics of a given computer architecture and many other tightly coupled system software/hardware constituents rather than just the CPU. Operating system, compilers, libraries, memory design and I/O subsystem characteristics may well dominate the results and make comparisons difficult. This report is intended to show Intel Pentium processor performance on a consistent set of benchmarks that can be used to predict the type of real application performance that you can expect to see and use on your own system.

THE INTEL PENTIUM® PROCESSOR

The Intel Pentium processor delivers outstanding performance for all PC software. It is fully compatible with the huge base of PC software. Additionally, the Pentium processor delivers the extra power needed for today's newest PC capabilities. It has immediate responsiveness for the latest, most demanding software with powerful realistic graphics and the ability to run full-screen, full-motion video. Pentium processor-based systems offer superior investment protection by providing performance to handle tomorrow's more demanding software with upgradability to even higher performance when needed.

The Pentium processor at 200 MHz delivers outstanding integer and floating-point performance (See Figures 2 and 3):

- **SPECint95* rating of 5.47**
- **SPECfp95* rating of 3.68**

The Pentium processor may contain design defects or errors known as errata. Current characterized errata are available upon request.

PRODUCT FEATURE HIGHLIGHTS

Fully compatible with an entire library of PC software based on operating systems such as MS-DOS*, Windows 3.1, Windows for Workgroups* 3.11, Windows 95*, OS/2*, UnixWare*, SCO UNIX*, Windows NT*, NEXTSTEP*, and Sun Solaris*.

- **60, 66, 75, 90, 100, 120, 133, 150, 166 and 200 MHz Versions**
- **Superscalar Architecture**
- **Enhanced Floating Point Unit**
- **64-bit Data Bus**
- **Branch Prediction Feature**
- **Separate Code and Data Caches with MESI Protocol**
- **Performance Monitoring and Execution Tracing**
- **High-Reliability Error Detection**

iCOMP® INDEX

The iCOMP® (Intel Comparative Microprocessor Performance) index provides a simple relative measure of microprocessor performance. It is not a benchmark, but a collection of benchmarks used to calculate an index of relative processor performance intended to help end users decide which Intel microprocessor best meets their desktop computing needs. Intel has updated the iCOMP Index to version 2.0. There are three major market and performance trends that have influenced the latest formula adjustment:

1. **The development of benchmarks appropriate for emerging popular application profiles,**
2. **The accelerating transition to 32-bit operating systems and applications on the desktop, and the**
3. **Proliferation of multimedia, communications and 3D.**

The iCOMP Index 2.0 ratings cannot be compared with the earlier version of iCOMP because different benchmarks are used.

The iCOMP Index 2.0 rating is based on the technical categories that encompass three

separate aspects of 32-bit CPU performance: integer, floating-point, and multimedia. The multimedia portion is further divided into four components: Audio, Imaging, Video and 3-D (see Intel Media Benchmark section below). Each category and subcategory is weighted based on the estimated percentage of time it enters into the processing picture. The higher the iCOMP rating, the higher the relative performance of the microprocessor. Each processor's iCOMP Index rating is calculated at the time that processor is introduced except that ratings for processors introduced before iCOMP Index 2.0 were calculated when version 2.0 was released. Four standard benchmarks are used for 2.0 (CPUmark32*, Norton SI32*, SPECint95, SPECfp95) as well as the Intel Media Benchmark. Differences in system design (including software) and configuration will affect actual performance.

Figure 1 illustrates the iCOMP 2.0 ratings for six Intel microprocessors. The Intel Pentium processor at 200 MHz has an iCOMP 2.0 rating of 142. System configurations used in iCOMP Index 2.0 measurements are listed in Appendix A. For more information on iCOMP Index 2.0, contact Intel Corporation or visit the website http://www.intel.com.

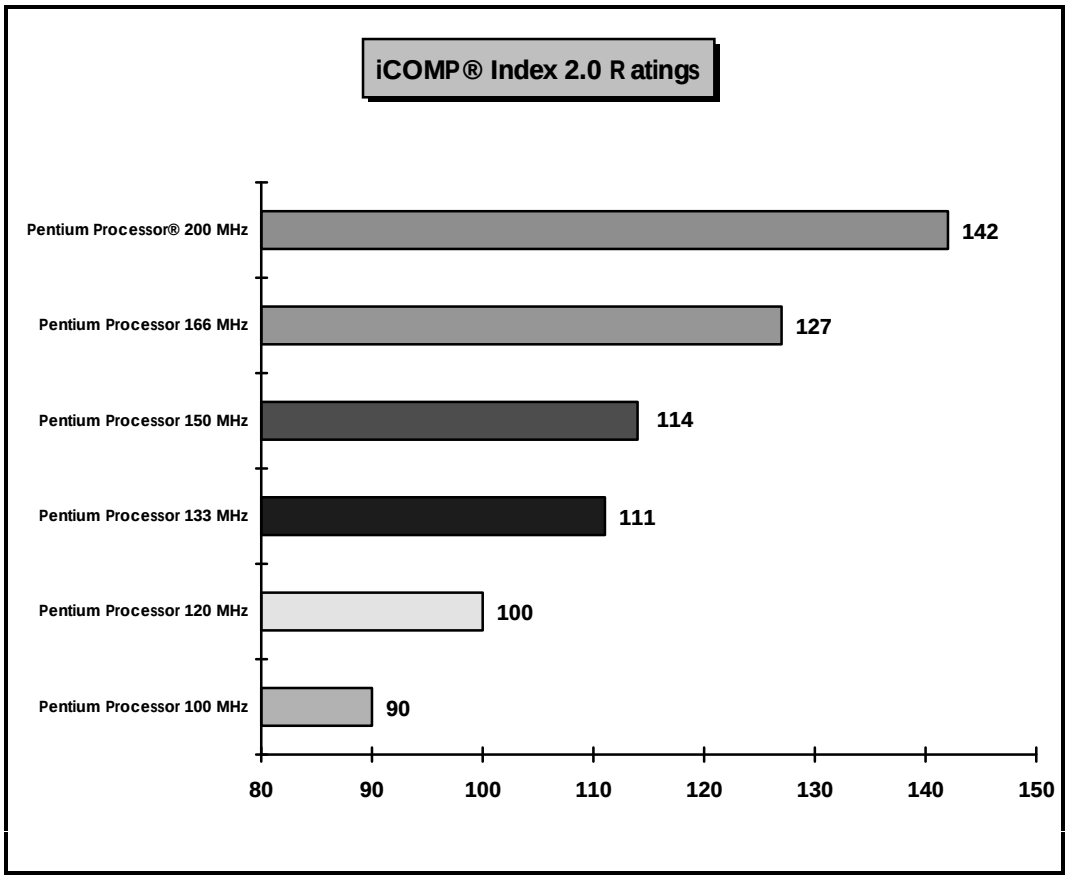

Figure 1. iCOMP® Index 2.0 Ratings for Intel Processors (System configurations are listed in Appendix A.)

Intel Media Benchmark

Multimedia applications are proliferating rapidly. Intel developed the Intel Media Benchmark since an adequate industry standard multimedia benchmark does not currently exist to measure multimedia performance. The Intel Media Benchmark measures the performance of processors running algorithms found in multimedia uses. It incorporates audio and video playback, image processing, wave sample rate conversion, and 3D geometry.

The most probable anticipated use of the microprocessor in video applications will be to provide software decompression of video data. One algorithm, which is increasing in popularity, is the industry standard MPEG1 algorithm, such as that used by the popular Xing Technology decompression and the Berkeley MPEG1 shareware software. The video playback component of the Intel Media Benchmark implements the MPEG1 decompression algorithm (ISO11172-2). This benchmark focuses on the contribution of the processor in implementing a video player.

The audio component is based on the MPEG1 audio decompression definition (ISO11172-3). This component of the Intel Media Benchmark decompresses and plays a stereo audio clip. The audio component also includes sample rate conversion, special effects and stereo mixing.

The image processing component applies digital filters to true-color (24-bit) bitmap images. These filters include a box filter which is used to implement filters such as Gaussian blur and embossing, an image blending function used to combine two images into one, and a color space conversion function used to change an image's luminance.

The 3D component of the Intel Media Benchmark is based on Direct3D* and a geometry routine from the OpenGL* 3D Triangle benchmark. These tests are used to measure the geometry portion of a 3D workload. As such, rendering performance is not measured. It is Intel's belief that in the next two to three years rendering will be encompassed by the graphic accelerator card. Thus the performance of rendering will not be CPU bound and is therefore not measured with regard to the processor performance. However, it is anticipated that 3D geometry will remain the duty of the processor.

MICROPROCESSOR PERFORMANCE SUMMARY

UNIX* Processor Benchmarks

SPEC95* is a software benchmark product produced by the Standard Performance Evaluation Corp. (SPEC), a non-profit group of computer vendors, system integrators, universities, research organizations, publishers and consultants throughout the world. It was designed to provide measures of performance for comparing compute-intensive workloads on different computer systems. SPEC95 consists of two suites of benchmarks: CINT95* for measuring and comparing compute-intensive integer performance, and CFP95* for measuring and comparing compute-intensive floating-point performance. The two suites provide component-level benchmarks that measure the performance of the computer's processor, memory architecture and compiler. SPEC benchmarks are selected from existing application and benchmark source code running across multiple platforms. Each benchmark is tested on different platforms to obtain fair performance results across competing hardware and software systems.

SPEC95 is the third major version of the SPEC benchmark suites, which in 1989 became the first widely accepted standard for comparing compute-intensive performance across various architectures. The new release replaces SPEC92*, which will be gradually phased out between now and June 1996, when SPEC will stop publishing SPEC92 results and stop selling the benchmark suite. Performance results from SPEC95 cannot be compared to those from SPEC92, since new benchmarks have been added and existing ones changed.

The CINT95 suite, written in C language, contains eight CPU-intensive integer benchmarks. It is used to measure and calculate the following metrics:

- **SPECint95 -- The geometric mean of eight normalized ratios (one for each integer benchmark) when compiled with aggressive optimization for each benchmark.**
- **SPECint_base95* -- The geometric mean of eight normalized ratios when compiled with the conservative optimization for each benchmark.**

The CFP95 suite, written in FORTRAN* language, contains 10 CPU-intensive floating point benchmarks. It is used to measure and calculate the following metrics:

- **SPECfp95 -- The geometric mean of 10 normalized ratios (one for each floating point benchmark) when compiled with aggressive optimization for each benchmark.**
- **SPECfp_base95* -- The geometric mean of 10 normalized ratios when compiled with conservative optimization for each benchmark.**

Because today's commercial applications are comprised almost exclusively of integer-intensive programs, SPECint95 represents an appropriate instruction mix for commercial applications and is a much more effective benchmark to predict 32-bit business performance than SPECfp95. The integer performance of the Intel Pentium processor 200 MHz on SPEC and other UNIX* processor benchmarks ranges from roughly 4 to 5 times the performance of the fastest 486 processors.[1] This performance is shown in the following figures. Figures 2 and 3 show the SPECint95 and SPECfp95 performances under 1 MB second-level cache ("L2 cache") configurations.

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[1] Information on the Intel486™ processor line is available in previously published Intel486 processor performance briefs.

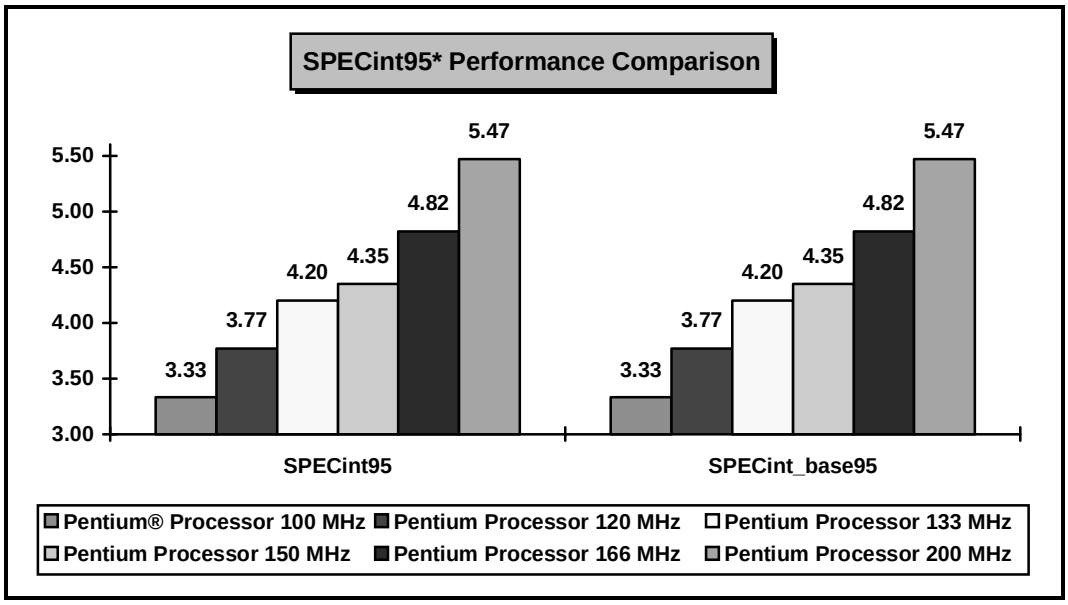

Figure 2. Intel Pentium® Processor Performance for the UNIX* SPECint95* Benchmark with 1 MB L2 Cache on Pentium Processors at 100, 120, 133, 150, 166 and 200 MHz

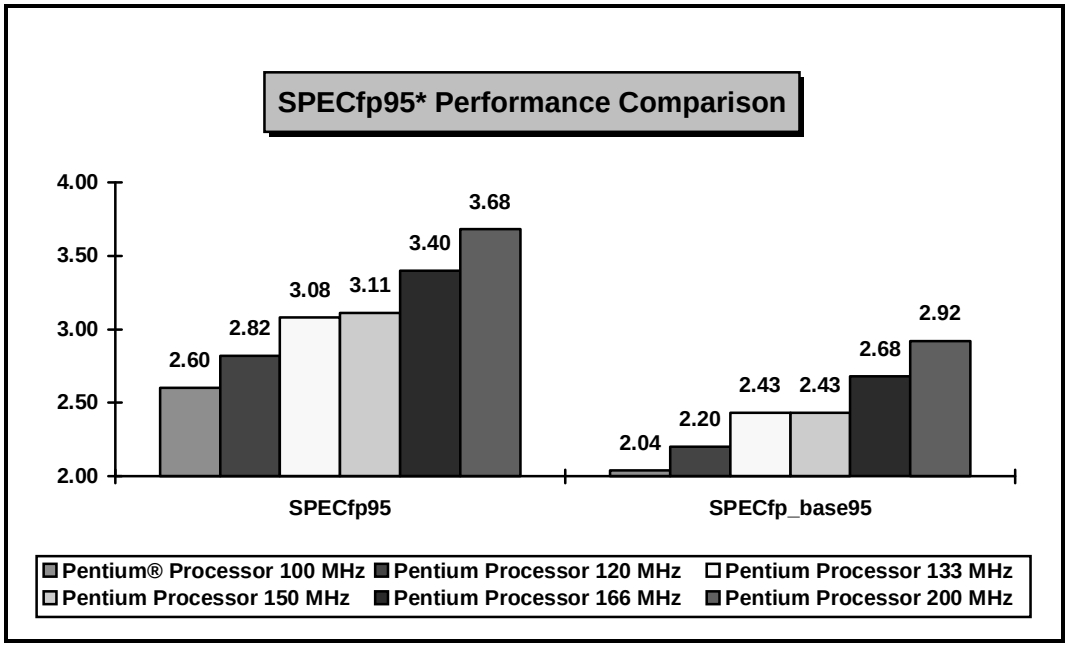

Figure 3. Intel Pentium® Processor Performance for the UNIX* SPECfp95* Benchmark with 1 MB L2 Cache on Pentium Processors at 100, 120, 133, 150, 166 and 200 MHz

DOS*/Windows* Processor Benchmarks

32-BIT/16-BIT CPU

The 32-bit integer Windows performance of the Pentium processor is illustrated by the commonly used Windows benchmarks presented. These benchmarks represent the high performance potential achieved with the Intel Pentium processor for running 32-bit applications.

Norton SI32* is a new 32-bit Windows 95 benchmark designed to show the speed of a system (CPU, L2 cache, and memory), compared to the speed of other systems for running common 32-bit applications. This benchmark is part of the SYSINFO* module of the Norton Utilities* for Windows 95. SI16* is the 16-bit equivalent.

CPUmark32* is a 32-bit Windows processor benchmark provided by Ziff-Davis Labs designed to measure the performance potential for running future 32-bit applications. CPUmark16* is the 16-bit equivalent.

Figures 4 and 6 illustrate the Intel Pentium processor performance when executing these two popular 32-bit benchmarks. Figures 5 and 7 show the 16-bit performance.

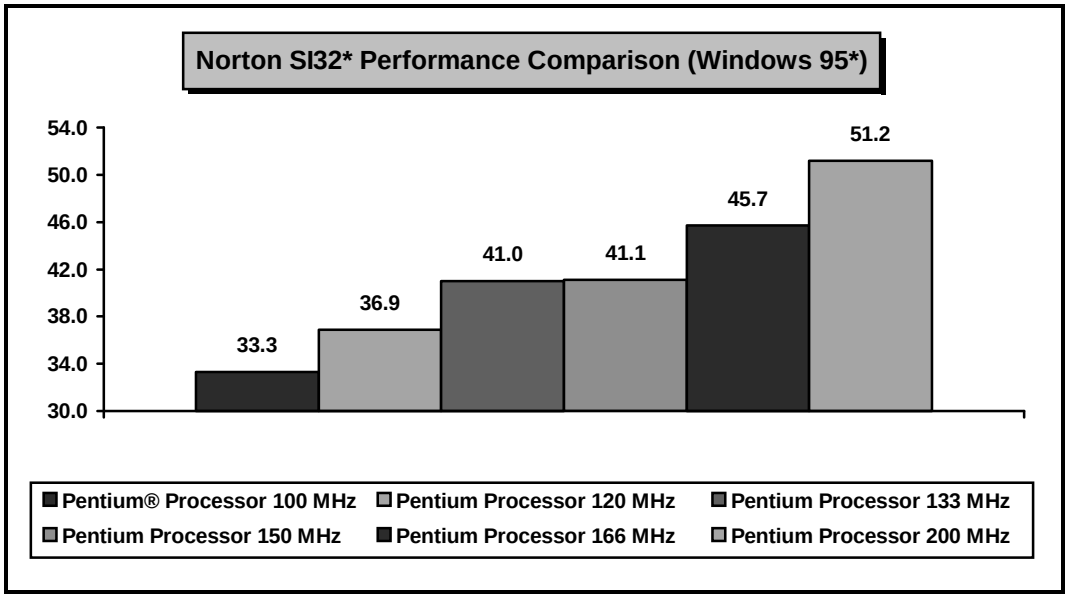

Figure 4. Intel Pentium® Processor Performance for the Norton SI32* Benchmark

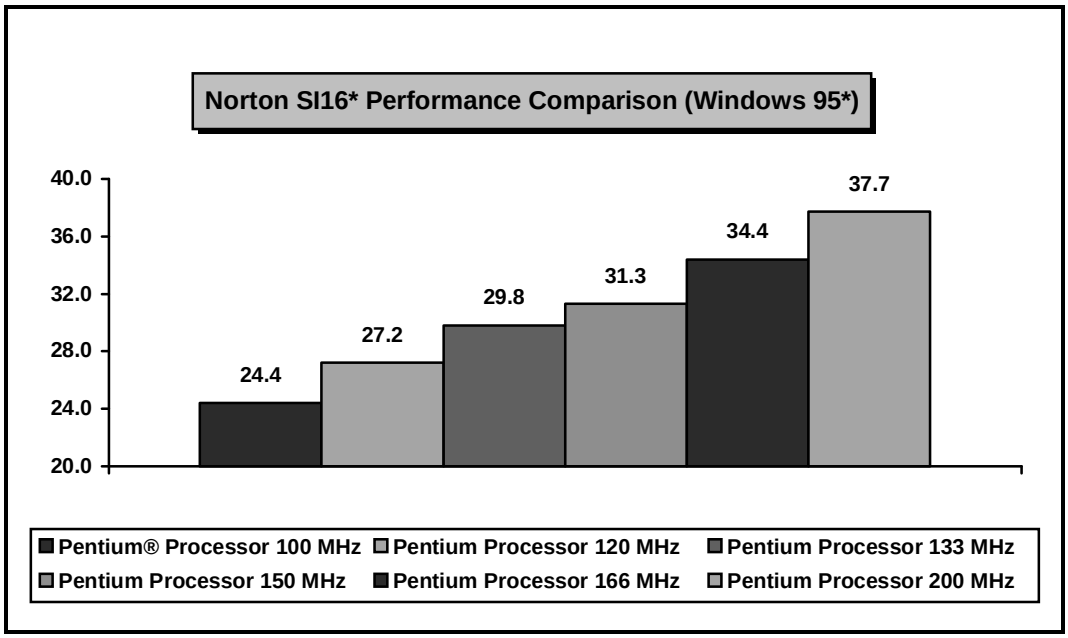

Figure 5. Intel Pentium® Processor Performance for the Norton SI16* Benchmark

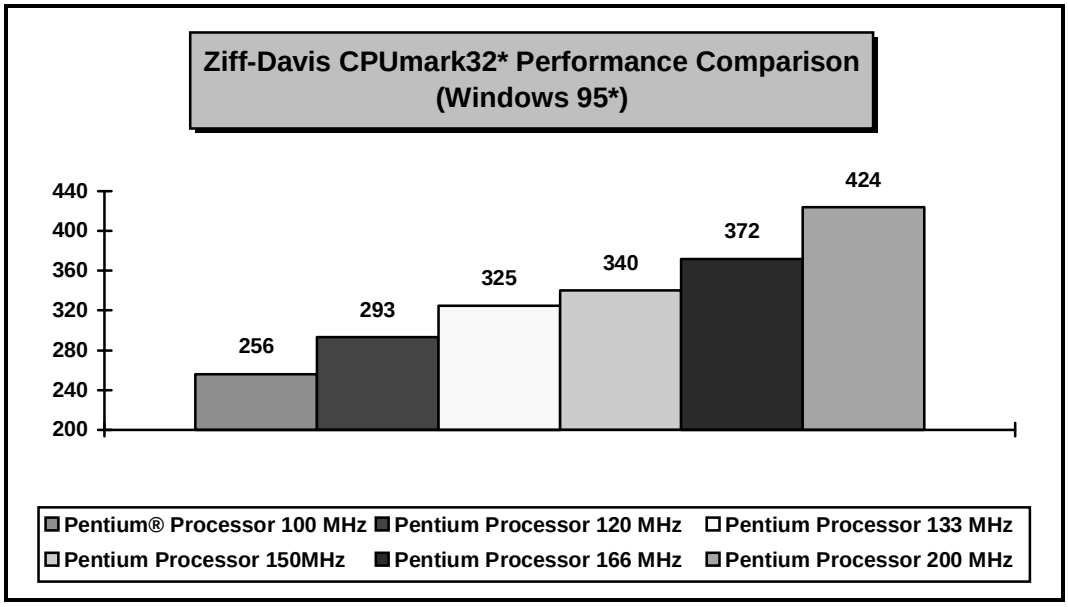

Figure 6. Intel Pentium® Processor Performance for the Ziff-Davis CPUmark32* Benchmark

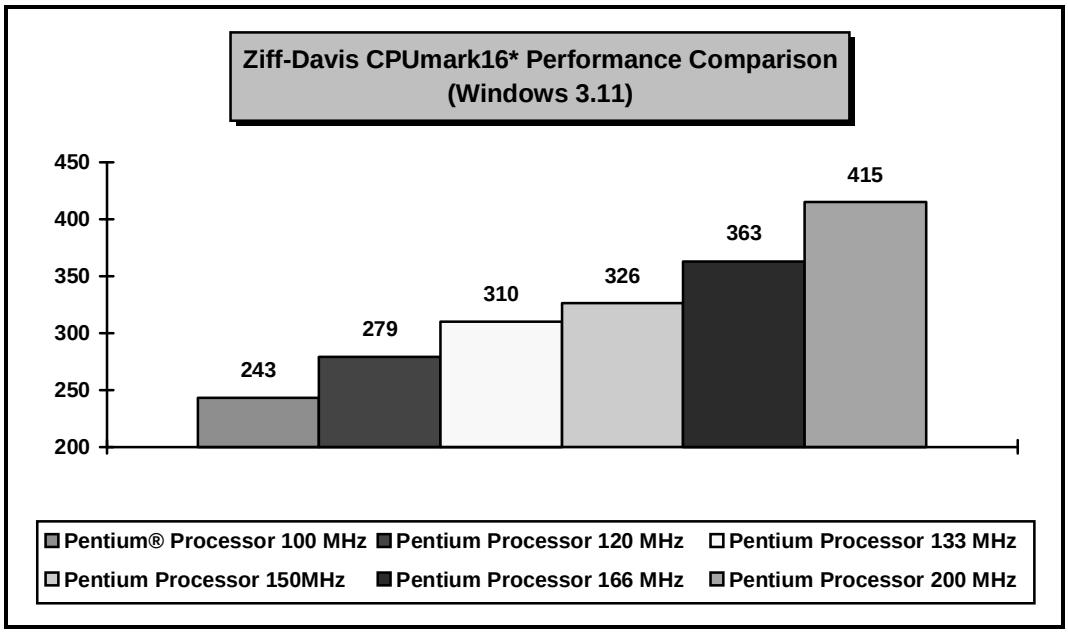

Figure 7. Intel Pentium® Processor Performance for the Ziff-Davis CPUmark16* Benchmark

SYSTEM LEVEL BENCHMARKS

To measure realistic application performance, SYSmark95* for Windows for Workgroups (16-bit applications) and SYSmark for Windows NT (32-bit applications) were chosen to gauge the performance of Intel Pentium processor-based systems. SYSmark95 for Windows for Workgroups is a suite of application software and associated benchmark scripts that have been developed by the Business Applications Performance Corporation (BAPCo), a non-profit consortium of PC OEMs, software vendors, semiconductor manufacturers and industry publications, in order to provide a tool for accurate and realistic measurement of personal computer performance running popular business-oriented applications in the Microsoft Windows operating environment. The scripts are developed to reflect usage patterns of PC users in a business-oriented environment.

SYSmark95* for Windows for Workgroups*

SYSmark95 for Windows for Workgroups includes 16-bit benchmark scripts for the following applications selected from six categories of application software:

- **Word-processing** — **WordPerfect* 6.0, MS Word* 6.0, AmiPro* 3.1**
- **Spreadsheet** — **Lotus 1-2-3* 5.0, MS Excel* 5.0**
- **Database** — **Paradox* 5.0**
- **Desktop Graphics** — **Corel Draw* 5.0**
- **Desktop Presentation** — **Freelance* 2.1, MS PowerPoint* 4.0**
- **Desktop Publishing** — **Pagemaker* 5.0**

Figure 8 illustrates the SYSmark95 for Windows for Workgroups Performance on Intel Pentium processor systems.

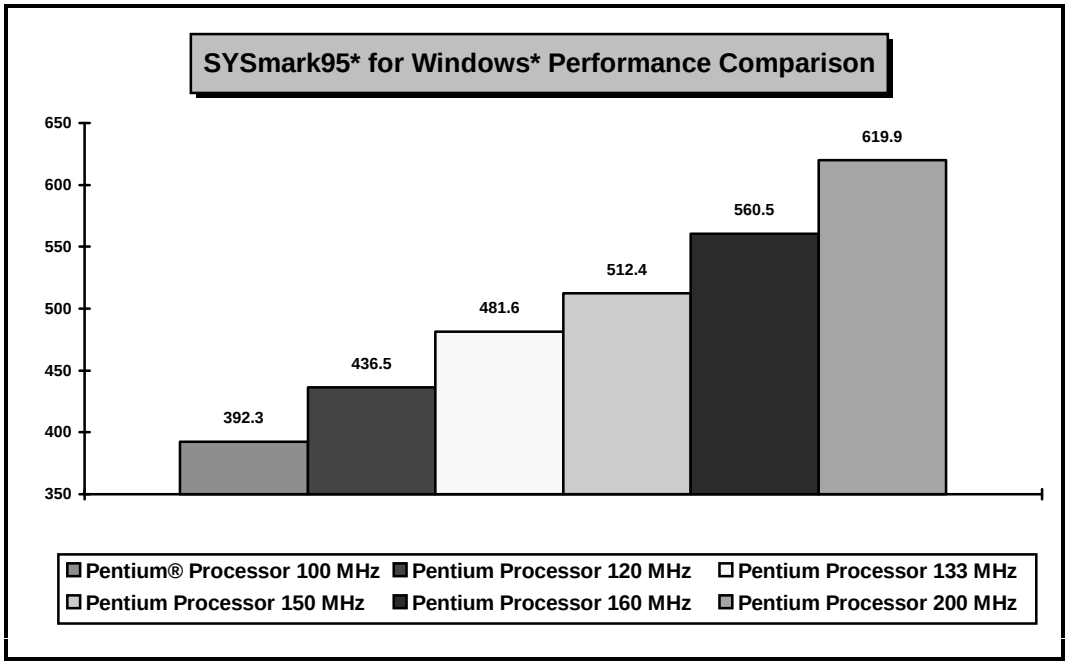

Figure 8. Intel Pentium® Processor Performance for the SYSmark95* for Windows for Workgroups* Benchmark

SYSmark* for Windows NT*

Workloads for SYSmark for Windows NT were developed based on BAPCo's standardized practice of surveying users to determine how they exercise popular applications in day-to-day work. The applications selected for testing had to be able to run across all three popular architectures. SYSmark for Windows NT can generate performance metrics as a composite of all the different applications or for a specific application, such as word processing or spreadsheets. The following applications are included in SYSmark for Windows NT.

- **Word-processing** — **MS Word* 6.0 (native 32-bit on all architectures)**
- **Spreadsheet** — **MS Excel* 5.0 (native 32-bit on all architectures)**
- **Project Management (native** — **Welcom Software Technology Texim Project 2.0e* 32-bit on all architectures)**
- **Computer-Aided Design** — **Orcad MaxEDA 6.0* (PCB design tool) (native 32-bit on all architectures)**
- **Presentation Graphics** — **MS PowerPoint* 4.0 (16-bit Windows emulation)**

Figure 9 gives the SYSmark NT rating for each of the Pentium processors.

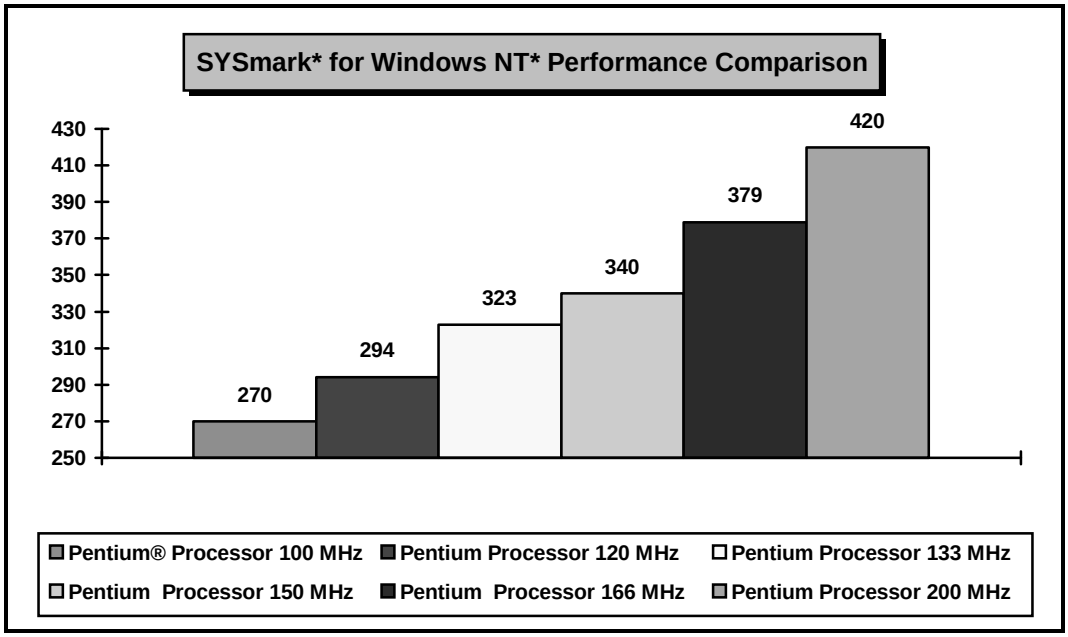

Figure 9. Intel Pentium® Processor Performance for SYSmark* for Windows NT* Benchmark

32-bit Applications Under Windows NT*

In this section, we present the performance of demanding 32-bit Windows NT applications running under the Windows NT environment. The workloads for these applications are sample demos created by Intel designed to exercise the 32-bit performance of the Intel Pentium processor.

Elastic Reality* creates special effects for animation. You can use this tool to create still (single frame) and moving (multiple frame) warps and morphs by drawing shapes (outlining the various features to transform) with familiar structured drawing tools.

Extreme 3D* is a tool used to create 3D modeling, animation, rendering, and composite effects to designs and productions. It is used by graphic artists, multimedia developers, and video professionals.

Photoshop* is a professional-level program for desktop image design and production. Designers and photographers can create original artwork, correct color, retouch and composite scanned images, and prepare professional-quality separations and output.

Pixar Typestry* is a program for creating 3D text with shading, perspective, and light effects. Five basic steps are included to create a picture: type in text, position text, apply a surface to the text, add lights and render text.

Vistapro* is a 3D landscape simulation program. Using U.S. Geological Survey data converted into Digital Elevation Model files, Vistapro can accurately recreate real world landscapes. As a fractal landscape design generator, Vistapro can create imaginary landscapes from a random seed.

MathCAD* is one of the world's leading technical calculation software programs. MathCAD allows technical professionals and educators to perform numeric and symbolic calculations, solve differential equations, and handle advanced matrix operations. Graphics features let you visualize data and functions in 2-D and 3-D with point-and-click ease--including polar, contour and parametric plots. Figure 10 illustrates the 32-bit application performance under Windows NT for the Intel Pentium processor scaled to the Pentium processor at 100 MHz.

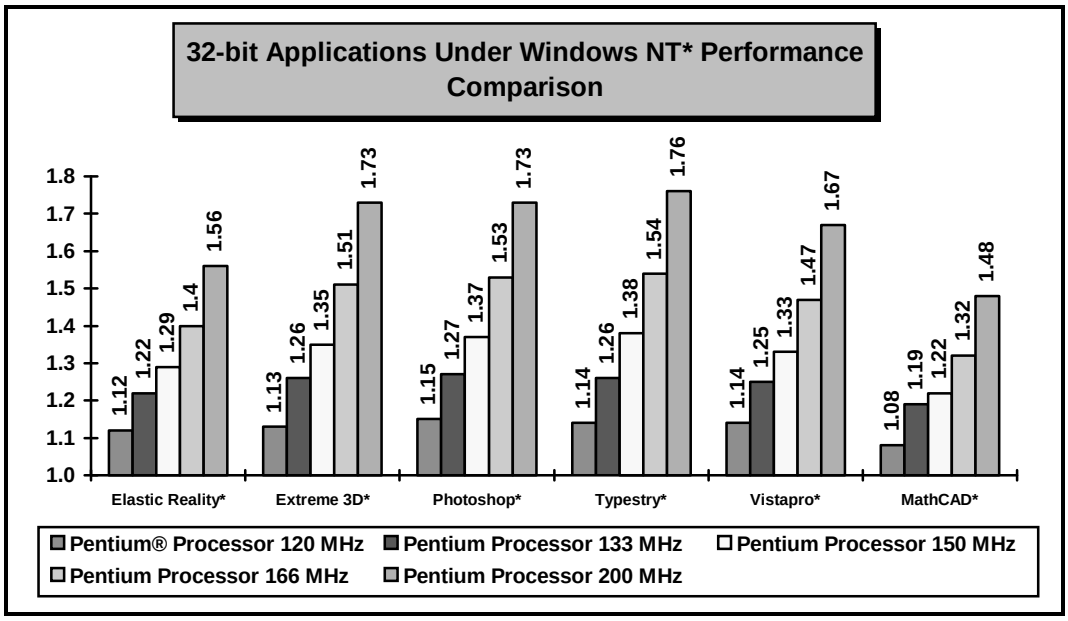

Figure 10. Intel Pentium® Processor Performance for 32-bit Applications Under Windows NT* (Scaled to the Pentium Processor at 100 MHz)

32-bit Applications Under Windows 95*

In this section we present the performance of 32-bit Windows applications running under Windows 95. The workloads were created by Intel using the new Windows 95 Microsoft Office* applications, Lotus Freelance Graphics*, CorelDRAW Illustrator*, Lotus Word Pro*, Aldus PageMaker* and Borland Paradox*. Figure 11 illustrates the 32-bit application performance average under Windows 95 for the Intel Pentium processor.

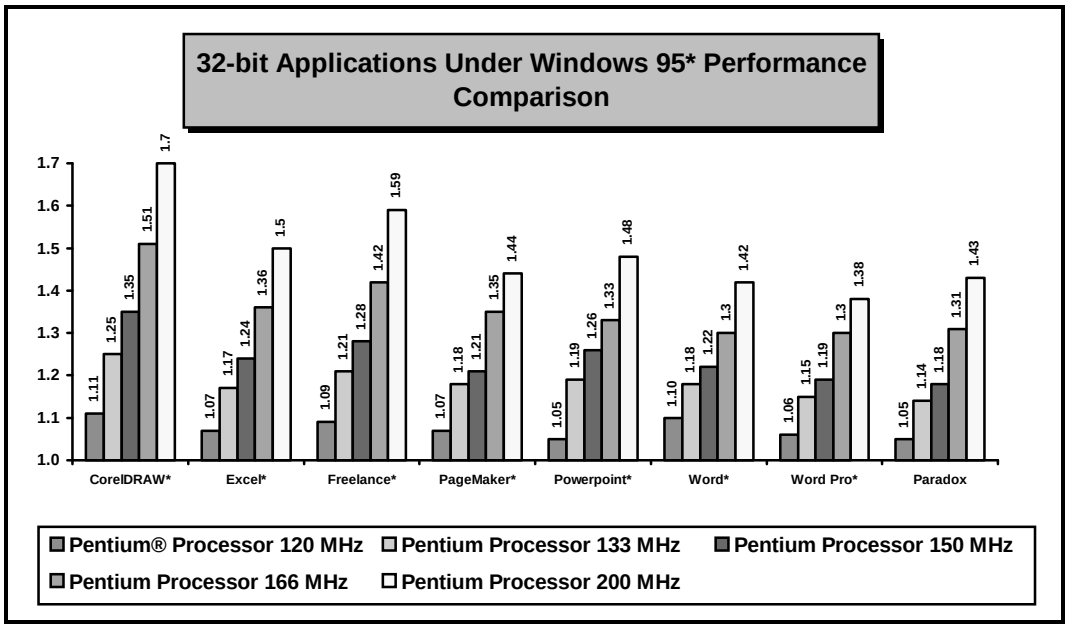

Figure 11. Intel Pentium® Processor Performance for 32-bit Applications Under Windows 95* (Scaled to the Pentium Processor 100 MHz)

Summary

Table 1 summarizes the microprocessor benchmark performance results for the Intel Pentium processor family. (Higher the number better the performance).

Table 1. Microprocessor Benchmark Results

Processor Benchmarks	Pentium® Processor 100 MHz	Pentium Processor 120 MHz	Pentium Processor 133 MHz	Pentium Processor 150 MHz	Pentium Processor 166 MHz	Pentium Processor 200 MHz
UNIX*						
SPEC95*						
SPECint95*	3.33	3.77	4.20	4.35	4.82	5.47
SPECint_base95*	3.33	3.77	4.20	4.35	4.82	5.47
SPECfp95*	2.60	2.82	3.08	3.11	3.40	3.68
SPECfp_base95*	2.04	2.20	2.43	2.43	2.68	2.92
Windows* (256/512 KB L2)						
Norton System Index*						
SI16* (Win 95*)	22.6	25.2	27.4	28.7	32.1	34.1
SI32* (Win 95)	28.9	31.1	34.2	35.9	39.9	44.6
Ziff-Davis						
CPUmark16* (WfW 3.11*)	225	253	281	311	346	392
CPUmark32* (WfW 3.11)	234	259	287	321	356	400
CPUmark16 (Win 95)	221	242	275	304	337	383
CPUmark32 (Win 95)	228	243	278	311	343	387
Windows (1 MB L2)						
Norton System Index						
SI16 (Win 95*)	24.4	27.2	29.8	31.3	34.4	37.7
SI32 (Win 95)	33.3	36.9	41.0	41.1	45.7	51.2
Ziff-Davis						
CPUmark16 (WfW 3.11*)	243	279	310	326	363	415
CPUmark32 (WfW 3.11)	261	296	329	343	382	435
CPUmark16 (Win 95)	240	274	303	325	359	413
CPUmark32 (Win 95)	256	293	325	340	372	424

Table 2 summarizes the System-Level Benchmark performance for the Intel Pentium processor using SYSmark for Windows NT and SYSmark95 for Windows for Workgroups. The iCOMP Index 2.0 rating is also given.

Table 2: SYSmark* for Windows NT* and SYSmark95* for Windows for Workgroups* Results Along with the iCOMP® 2.0 Rating

System-Level Benchmarks	Pentium® Processor 100 MHz	Pentium Processor 120 MHz	Pentium Processor 133 MHz	Pentium Processor 150 MHz	Pentium Processor 166 MHz	Pentium Processor 200 MHz
SYSmark/NT*	**270**	**294**	**323**	**340**	**379**	**420**
Spreadsheet	261	271	298	317	353	382
Project Management	240	257	286	286	318	347
Word Processing	291	312	335	351	396	431
Presentation	306	343	377	405	451	513
CAD	259	297	328	350	388	446
SYSmark95* for Windows for Workgroups*	**392.3**	**436.5**	**481.6**	**512.39**	**560.5**	**619.9**
Word Processing	358.4	396.2	437.7	463.9	505.5	561.7
Spreadsheet	344.3	391.5	431.6	477.01	503.8	568.2
Database	532.7	562.5	619.4	627.35	708.3	735.7
Desktop Graphics	380.0	445.3	493.2	537.9	597.6	693.1
Desktop Presentation	350.0	390.9	429.3	449.29	492.5	552.3
Desktop Publishing	337.4	366.0	398.7	417.39	438.1	472.3
iCOMP® Index 2.0 Rating	**90**	**100**	**111**	**114**	**127**	**142**

Table 3 summarizes the execution times of 32-bit application.

Table 3. 32-bit Application Execution Times.

System-Level Benchmarks	Pentium® Processor 100 MHz	Pentium Processor 120 MHz	Pentium Processor 133 MHz	Pentium Processor 150 MHz	Pentium® Processor 166 MHz	Pentium® Processor 200 MHz
Elastic Reality* (seconds)	146.1	130.3	119.5	113.5	104.3	93.6
Extreme 3D* (seconds)	258.1	227.5	204.8	190.6	170.7	148.9
Photoshop* (seconds)	410.6	358.1	323.1	300.7	268.6	236.8
Typestry* (seconds)	443.9	389.0	353.1	321.5	288.6	252.1
Vistapro* (seconds)	211.3	185.9	169.0	159.3	144.1	126.2
MathCAD* (seconds)	56.3	52.2	47.1	46.2	42.6	38.1
32-bit Apps/Windows 95*						
CorelDRAW* (seconds)	343.90	311.07	274.51	254.2	228.3	202.9
Excel* (seconds)	170.42	159.02	145.04	137.6	125.0	113.4
Freelance* (seconds)	278.04	254.58	230.47	217.6	196.1	175.4
PageMaker* (seconds)	119.42	111.27	101.30	98.4	88.4	83.1
Powerpoint* (seconds)	126.07	119.66	106.04	99.9	94.6	85.3
Word* (seconds)	147.65	134.58	124.62	121.2	113.4	104.3
Word Pro* (seconds)	122.21	115.54	106.00	102.3	94.1	88.7
Paradox* (Seconds)	150.09	143.04	131.69	127.0	114.5	105.3

APPENDIX A — TEST CONFIGURATIONS

System Configurations used in iCOMP® Index 2.0 Ratings

System	Dell Dimension* XPS 100, 120, 133, 150, 166, 200 MHz
FPU	Integrated
Primary Cache	16 KB (8 KB I + 8KB D)
Secondary Cache	512K WB Burst
Hard Disk	Quantum Fireball EIDE with Integrated EIDE disk controller
Video	Matrox Millennium PCI
Audio	Creative Labs Sound Blaster 16
For SPEC95:	
Memory Size	64 MB EDO
Operating System	UnixWare 2.0
C Compiler	Intel C Ref. Compiler 2.3
FORTRAN Compiler	Intel FORTRAN Ref. Compiler 2.3
For other benchmarks:	
Memory Size	32 MB EDO
Operating System	Windows 95*

UNIX System Configurations

System	Xtended Xpress Desktop
FPU	Integrated
Primary Cache	16 KB (8 KB I + 8KB D)
Secondary Cache	1 MB WB
Memory Size	64 MB Fast Page
Hard Disk Controller	Adaptec 2940W SCSI/PCI
Hard Disk	Seagate ST31250W
Operating System	UnixWare 2.0
C Compiler	Intel C Ref. Compiler 2.3
FORTRAN Compiler	Intel FORTRAN Ref. Compiler 2.3

Windows* System Configuration for Pentium® Processors with 1MB L2

System	Xtended Xpress Desktop
FPU	Integrated
Primary Cache	16 KB (8 KB I + 8KB D)
Secondary Cache	1 MB WB
Memory Size	16MB Fast Page (WfW 3.11), 64MB Fast Page (Windows 95*)/70ns

Windows* System Configurations for Pentium® Processors at 100, 120 and 133 MHz

System	Gateway P5-133XL*, P5-120, P5-100
FPU	Integrated
Primary Cache	16 KB (8 KB I + 8 KB D)
Secondary Cache	256 KB WB Burst
Memory Size/Speed	16 MB EDO (WFW3.11), 64 MB EDO (Windows 95, Windows NT 3.51), 70 ns
Motherboard Chip set	Intel 82430 FX PCIset
Hard Disk Controller/Bus	Adaptec 2940W* SCSI/PCI
Hard Disk	Seagate ST31250W
Graphics	1024x768 Resolution, 256 Colors
Operating System 1	**DOS* 6.21/Windows NT* 3.51**
Video Controller/Bus/Drivers	Matrox Millennium*/ PCI/ v1.1
Video Memory Type/Size	2 MB WRAM
Operating System 2	**DOS 6.21/Windows for Workgroups***
Video Controller/Bus/Drivers	Matrox Millennium/ PCI/ v1.02
Video Memory Type/Size	2 MB WRAM
Graphics	640 x480 Resolution, 256 Colors
Hard Disk	Quantum Fireball* IDE
Operating System 3	**DOS 6.21/Windows 95***
Video Controller/Bus/Drivers	Matrox Millennium/ PCI/ v1.02
Video Memory Type/Size	2 MB VRAM

Windows* System Configuration for Pentium® Processors at 150, 166 and 200 MHz

System	Dell Dimension XPS*[1]
FPU	Integrated
Primary Cache	16 KB (8 KB I + 8 KB D)
Secondary Cache	512 KB WB Burst
Memory Size/Speed	16 MB SDRAM (WFW3.11), 64 MB SDRAM (Windows 95*, Windows NT* 3.51)
Motherboard Chip Set	Intel 82430 VX PCIset
Operating Systems	Same as table above

NOTE:

1. MHz model is a 166 MHz processor clocked at 150 MHz (oscillator change).