Application Note 142
Cyrix M II™-366
Processor Performance Report

REVISION HISTORY

Date	Version	Revision
5/19/99	0.4	Reworded several phrases.
5/3/99	0.3	Make document more specific. Page 2, typos
4/19/99	0.2	National Software Testing Laboratories (NSTL) data incorporated.
3/10/99	0.1	Initial First Draft

APPLICATION NOTE 142

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Megahertz and Performance

In the past, computer systems using x86 processors have been marketed on the basis of processor MHz, or clock speed. However, x86 processor architectures have diverged resulting in trade-offs between MHz and IPC (instructions per clock). Cyrix and other x86 processor vendors have recognized that MHz is not a good indicator of comparative performance. A commonly used analogy is the difference between rpm and horsepower – cars are not sold on the basis of engine rpm.

The best way to compare computer systems is to directly measure overall computer system performance with a given processor, rather than simply processor MHz. In a real-world situation, this comparison can be accomplished by running the same popular software applications on processors in standard computer systems. To ensure consistency, an application benchmark program should be used that runs these applications using a fixed script.

One of the most commonly used benchmarks for measuring processor performance is Winstone from Ziff Davis. One of the current versions is Business Winstone 99. The Business Winstone 99 script models the steps a typical user would perform in the real world. As the benchmark navigates through several types of applications, the computer-system components are exercised for a significant length of time.

Ziff Davis® Business Winstone® 99

Business Winstone 99 is a widely recognized application-based benchmark program that measures real desktop computer performance. This benchmark operates in a Windows® 98 environment and uses scripts from applications that simulate tasks performed by the typical user. Business Winstone 99 uses actual applications such as Microsoft Excel and Corel Draw.

While running the benchmark program, the applications are driven by a script which attempts to model the way users actually operate their systems. As the benchmark runs, it navigates through several applications, exercising the computer-system components by applying the same sequences that a typical user would use. A higher score indicates that it takes less time to perform the application. Business Winstone 99 runs nine of the most popular desktop applications spanning three software suites:

- Corel® WordPerfect Suite 8
- Lotus® Smartsuite 97
- Microsoft® Office 97

Methodology

The performance scores were obtained by the testing performed by the National Software Testing Laboratories, Inc. using Business Winstone 99 benchmark software. Comparable systems were used to compare the Cyrix M II processor, AMD K6-2 and Intel Celeron processors. The systems were comparably configured to isolate the processor component of system performance. A different motherboard for the Celeron processor was required since it is not Socket 7 compatible.

PROCESSORS TESTED

MANUFACTURER	PROCESSOR	BUS SPEED (MHZ)
Cyrix	MII-366	100
AMD	K6-2-366	66
Intel	Celeron 366	66

HARDWARE CONFIGURATION

Motherboard	M II	Microstar MS5169 (Socket 7)
	AMD K6-2	Microstar MS5169 (Socket 7)
	Celeron	Abit LX6 (Slot 1)
L2 Cache	M II	512 KB Synchronous Burst
	AMD K6-2	512 KB Synchronous Burst
	Celeron	Internal 128 KB
Disk Drive		Quantum SE 6.4 GB
Graphics Card		ATi 3D Charger, 4 MB VRAM 4.10.2440
Memory		64 MB SDRAM

OPERATING SYSTEM CONFIGURATION

Operating System	Windows 98 (FAT 32)
Virtual Memory Settings	Default (32-bit)
Disk Compression	Not Installed
Video Resolution	1024 x 768 x 256 Resolution 75 Hz Refresh Rate

Note: All settings are default settings unless otherwise stated.

Benchmark Procedure

The following steps were used to obtain a benchmark number for each processor using Ziff-Davis's Business Winstone 99 benchmark program. Comparably configured systems were used to test the Cyrix M II, AMD K6-2 and the Intel Celeron processors, except that the Celeron processors required different motherboards.

Platform Setup

1. The PC is assembled and configured as previously indicated.

2. The hard drive is formatted to remove all files including previous operating system or configuration files.

3. Windows 98 is installed and setup according to the parameters listed in the Operating System Configuration table (see page 4).

4. Business Winstone 99 benchmarking software is installed.

5. The hard drive is defragmented using Windows 98 defrag utility.

Benchmark Testing

1. Run Business Winstone 99 benchmark program and record results.

2. The hard drive is defragmented.

3. Exit windows and power down.

4. Reboot PC computer.

5. Repeat steps 1-4 twice.

Business Winstone 99 Benchmark Testing Results

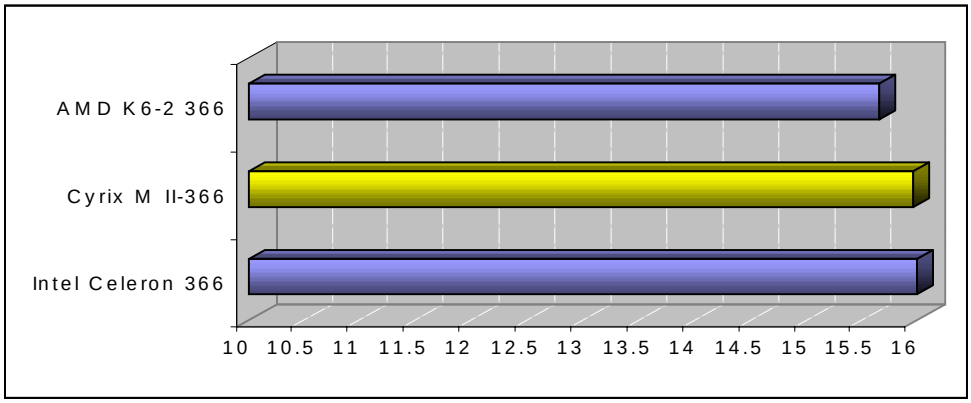
The following Business Winstone 99 scores were obtained for the Intel Celeron, Cyrix M II and AMD K6-2 processors by testing performed independently by the National Software Testing Laboratories Inc. Larger numbers indicate higher performance. The test was administered three times and the averages of those scores are listed below.

BUSINESS WINSTONE 99 SCORES

PROCESSOR	SCORE
Intel Celeron 366	16.9
Cyrix M II-366	16
AMD K6-2 366	15.7

Based on these tests, the Cyrix M II-366 processor is in the same performance class as the AMD K6-2 366 and the Intel Celeron 366 processors. The Cyrix M II processor achieves megahertz-equivalent performance to competing processors due to its large internal cache, enhanced memory management unit, and other state-of-the art architectural features. The Cyrix M II processor can process more instructions per clock cycle, allowing superior performance for predominately integer-based applications.

366 CLASS BENCHMARK TESTING RESULTS



Note: The Business Winstone 99 overall scores are based on *weighted* individual scores.

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