FIC PT-2010 PCI SYSTEM BOARD
BENCHMARKING REPORT

April 1997

Revision 1.0

Update: 11-Api-1997

1.0 Introduction

To evaluate the PT-2010's performance and to ensure its compatibility with a complete range of the most popular operating systems and software applications, FICs Motherboard R&D Team conducted a comprehensive suite of benchmark tests on the board in a variety of hardware configurations, including a full selection of Intel Pentium®, IBM/Cyrix 6x86™, AMD-K5™, Intel P55C and Pentium OverDrive processors as well as Fast Page Mode, EDO and Synchronous DRAM types. The performance of the board running some of the most popular VGA adapter cards was also tested.

In order to demonstrate realistic business application performance, Winstone 97 under Windows 95 was chosen as the primary benchmarking tool for FICs tests. Winstone 97 Version 1.0 was developed by the Ziff-Davis Publishing Company to provide a tool for accurate and realistic measurement of system performance of personal computers running popular business-oriented applications in the Microsoft Windows 95 operating system environment. To demonstrate the performance of the PT-2010 in the Windows NT operating system environment, tests were also run using the Winstone 97 for Windows NT benchmarking tool.

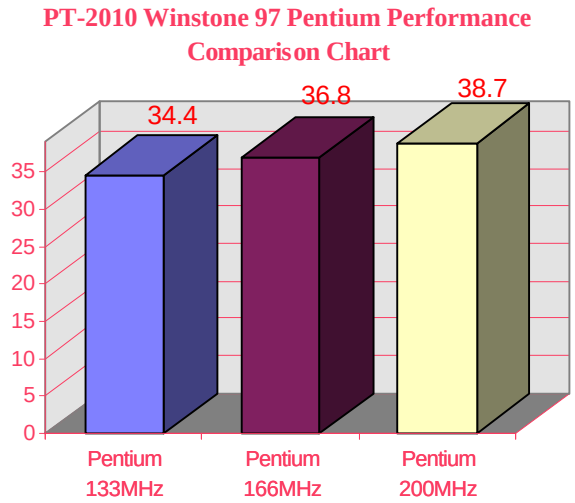
System Tests Configuration :

Main Board	FIC PT-2010
System Core Logic	INTEL 430VX
System BIOS	Award BIOS Version 8..07J803
VGA	Matrox Mystique 4MB SGRAM
VGA Driver	Millennium Windows 95 Driver Version 3.20
IDE Driver	Windows 95 PCI Master Driver
IDE HDD	Quantum Fireball 2110 PIO Mode 4 or DMA mode 2 (TM-2110A)
CD-ROM	Goldstar ATAPI 12X CD-ROM GCD-R580B
Operating System	Microsoft Windows 95

2.0 Processor Benchmarks Performance Summary

a) Intel Pentium Processor Performance

The chart below illustrates the Winstone 97 under Windows 95 performance processor benchmark with the PT-2010 using different speed Intel Pentium processors. The following is a sample of the results using 256KB Pipeline Burst SRAM, 32MB SDRAM, with a Matrox Mystique, 4MB SGRAM PCI VGA card in 1024 x 768 x 256 colors, resolution refresh rate of 75Hz, small font.

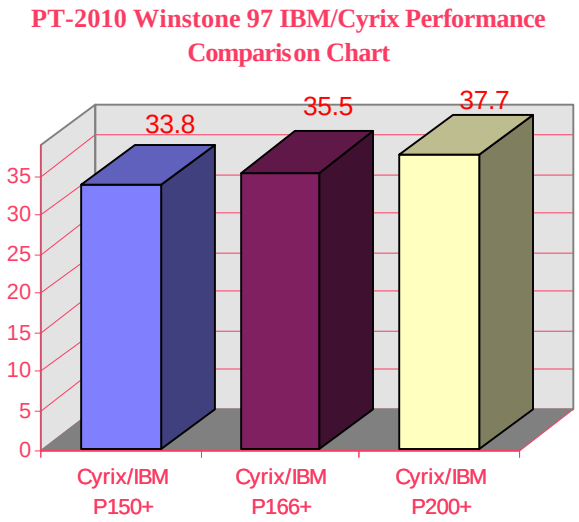


The table below provides more detailed benchmark testing data about the PT-2010 using different speed Intel Pentium processors. The board was configured with 256KB Pipeline Burst SRAM and 32MB SDRAM.

Benchmarks	Weighted Suite	Pentium 133MHz	Pentium 166MHz	Pentium 200MHz
Winstone 97	Business Winstone 97	34.4	36.8	38.7
	High End Winstone 97	14.7	16.1	17.4
Winbench 97	Business Disk WinMark 97	733	743	769
	CD-ROM WinMark 97	938	940	942
	High End Disk Winmark97	2340	2410	2440
	CD-ROM Playback 97	938	940	942
	CPUmark 16	281	318	352
	CPUmark 32	284	322	357
	Business Graphics WinMark 97	46.9	50.8	55.9
	High End Graphics WinMark 97	23	25.2	27.6

b) Cyrix 6x86 Processor Performance

The chart below illustrates the Winstone 97 under Windows 95 performance processor benchmark with the PT-2010 using different speed Cyrix/IBM processors. The board was configured with 256KB Pipeline Burst SRAM and 32MB SDRAM.

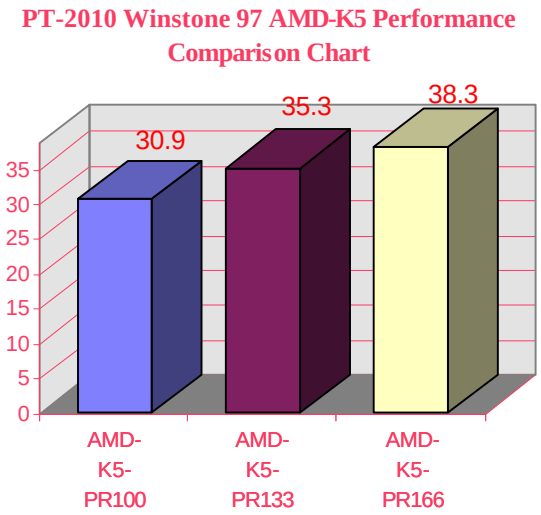


This table provides a detailed summary of PT-2010's benchmark performance using different speed Cyrix/IBM 6x86 processors. The board was configured with 256KB Pipeline Burst SRAM and 32MB SDRAM.

Benchmarks	**Weighted Suite**	**P133$^+$**	**P150$^+$**	**P166$^+$**
Winstone 97	Business Winstone 97	33.8	35.5	37.7
	High End Winstone 97	13.2	14.1	15.1
Winbench 97	Business Disk WinMark 97	733	738	757
	CD-ROM WinMark 97	924	926	941
	High End Disk Winmark97	2330	2370	2430
	CD-ROM Playback 97	924	926	941
	CPUmark 16	257	271	290
	CPUmark 32	260	277	305
	Business Graphics WinMark 97	47.3	49.9	55.5
	High End Graphics WinMark 97	23.4	24.8	27.6

c) AMD-K5 Processor Performance

The chart below illustrates the Winstone 97 under Windows 95 performance processor benchmark with the PT-2010 using different speed AMD-K5 processors. The board was configured with 256KB Pipeline Burst SRAM and 32MB SDRAM.

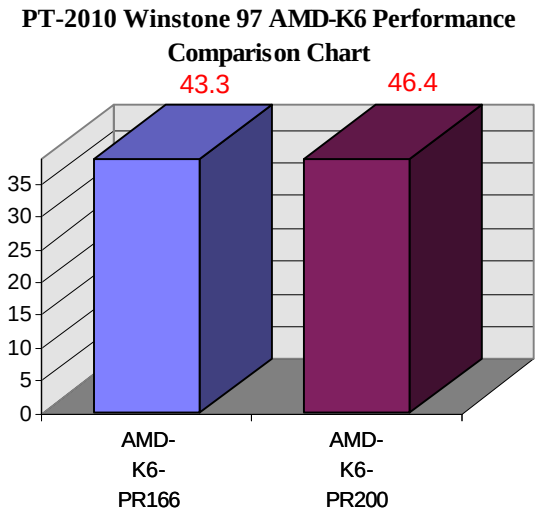


This table summarizes the processor benchmark performance of the PT-2010 using different speed AMD-K5 processors. The board was configured with 256KB Pipeline Burst SRAM and 32MB SDRAM.

Benchmarks	Weighted Suite	K5-PR100	K5-PR133	K5-PR166
Winstone 97	Business Winstone 97	30.9	35.3	38.3
	High End Winstone 97	13.3	14.9	16.6
Winbench 97	Business Disk WinMark 97	724	752	775
	CD-ROM WinMark 97	936	927	953
	High End Disk Winmark97	2230	2400	2480
	CD-ROM Playback 97	936	927	953
	CPUmark 16	183	245	275
	CPUmark 32	208	273	302
	Business Graphics WinMark 97	44.9	52.9	61.9
	High End Graphics WinMark 97	22	26.2	30.8

d) AMD-K6 Processor Performance

The chart below illustrates the Winstone 97 under Windows 95 performance processor benchmark with the PT-2010 using different speed AMD-K6/PR2 processors. The board was configured with 256KB Pipeline Burst SRAM and 32MB SDRAM.



This table summarizes the processor benchmark performance of the PT-2010 using different speed AMD-K6 processors. The board was configured with 256KB Pipeline Burst SRAM and 32MB SDRAM.

Benchmarks	Weighted Suite	K6-PR2/166	K6-PR2/200
Winstone 97	Business Winstone 97	43.3	46.4
	High End Winstone 97	18.1	19.7
Winbench 97	Business Disk WinMark 97	858	877
	CD-ROM WinMark 97	822	826
	High End Disk Winmark97	2740	2800
	CD-ROM Playback 97	822	826
	CPUmark 16	352	398
	CPUmark 32	420	465
	Business Graphics WinMark 97	81.7	94.3
	High End Graphics WinMark 97	36.8	42.3

e) Intel Pentium with MMX (P55C) Processor Performance

The following table summarizes the Processor Benchmark Performance with the PT-2010 using different speed Pentium with MMX (P55C) processors. The tests were conducted on a board featuring 256KB Pipeline Burst SRAM and 32MB SDRAM Memory.

Benchmarks	Weighted Suite	P55C-166MHz	P55C-200MHz	P55C-233MHz
Winstone 97	Business Winstone 97	41.5	43.6	45.9
	High End Winstone 97	17.8	19.7	20.7
Winbench 97	Business Disk WinMark 97	842	866	880
	CD-ROM WinMark 97	821	822	822
	High End Disk Winmark97	2660	2720	2740
	CD-ROM Playback 97	821	822	822
	CPUmark 16	350	407	431
	CPUmark 32	345	392	417
	Business Graphics WinMark 97	80.5	90.9	98.4
	High End Graphics WinMark 97	36	40.6	44.4

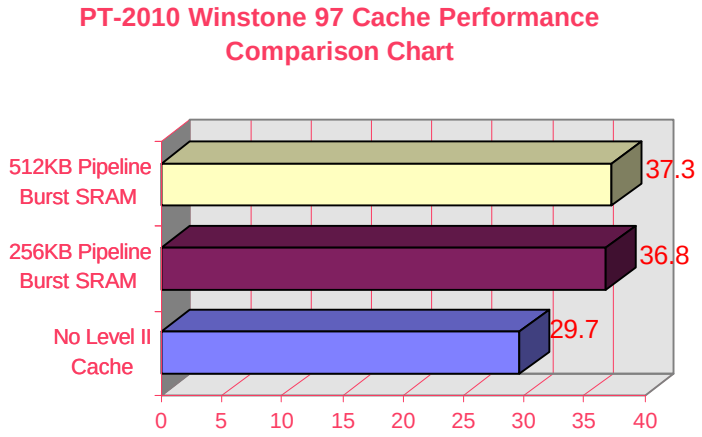
f) Pentium OverDrive Processor Performance

This table summarizes the processor benchmark performance of the PT-2010 using different speed Pentium OverDrive processors. The board was configured with 256KB Pipeline Burst SRAM and 32MB SDRAM.

Benchmarks	Weighted Suite	Pentium OverDrive-150MHz	Pentium OverDrive 166MHz
Winstone 97	Business Winstone 97	37.9	40.3
	High End Winstone 97	16.5	17.7
Winbench 97	Business Disk WinMark 97	769	784
	CD-ROM WinMark 97	948	953
	High End Disk Winmark97	2480	2520
	CD-ROM Playback 97	948	953
	CPUmark 16	319	352
	CPUmark 32	310	343
	Business Graphics WinMark 97	59.6	66
	High End Graphics WinMark 97	28.2	31.4

2.1 Cache Configurations

The PT-2010 supports a direct-mapped cache system with date size ranging form 0 to 512KB. Ultra-fast Burst Pipeline Synchronous Data SRAMs are supported to deliver an added boost to performance The chart below shows the comparative Winstone 96 performance for the PA-2006 using different Cache sizes: 512KB/256KB Pipeline Burst SRAM and no L2 Cache. The following table is based on a board featuring an Intel Pentium 166MHz processor with 32MB SDRAM.



The table below provides more detailed information about the performance of the PT-2010 using different cache sizes. The tests were conducted on a board featuring an Intel 166MHz Pentium processor with 32MB SDRAM.

Benchmarks	Weighted Suite	No L2	256KB	512KB
Winstone 97	Business Winstone 97	29.7	36.8	37.3
	High End Winstone 97	13.3	16.1	16.1
Winbench 97	Business Disk WinMark 97	696	743	753
	CD-ROM WinMark 97	913	940	941
	High End Disk Winmark97	2170	2410	2400
	CD-ROM Playback 97	913	940	941
	CPUmark 16	255	318	329
	CPUmark 32	251	322	332
	Business Graphics WinMark 97	35.8	50.8	52.5
	High End Graphics WinMark 97	18.3	25.2	25.8

2.2 Memory Configurations

This table measures the performance of the PT-2010 using different memory sizes of 32MB, and 64MB. The tests were done on a board featuring an Intel 166MHz Pentium processor, 256KB Pipeline Burst Cache and SDDRAM.

Benchmarks	Weighted Suite	32MB	64MB
Winstone 97	Business Winstone 97	36.8	37.4
	High End Winstone 97	16.1	17.3
Winbench 97	Business Disk WinMark 97	743	774
	CD-ROM WinMark 97	940	943
	High End Disk Winmark97	2410	2600
	CD-ROM Playback 97	940	943
	CPUmark 16	318	321
	CPUmark 32	322	322
	Business Graphics WinMark 97	50.8	51.9
	High End Graphics WinMark 97	25.2	25.3