

# **FIC KL-6011 PCI/AGP SYSTEM BOARD BENCHMARKING REPORT**

25 August 1997

Revision 1.0



## 1.0 Introduction

To evaluate the KL-6011 performance and to ensure its compatibility with a complete range of the most popular operating systems and software applications, FIC 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 II 266/300MHz processors as well as SDRAM DRAM types. The performance of the board running some of the most popular PCI/AGP 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 FIC 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 KL-6011 in the Windows NT operating system environment, tests were also run using the Winstone 97 for Windows NT 4.0 benchmarking tool.

### System Tests Configuration :

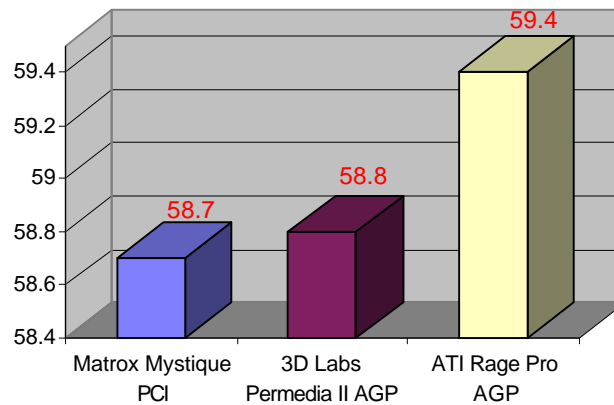
<b>Main Board</b>	FIC KL-6011
<b>System Core Logic</b>	Intel Natoma 440LX
<b>System BIOS</b>	AMI BIOS Version 627IB003
<b>Cache Size</b>	512k Pipeline Burst SRAM
<b>VGA</b>	Matrox Mystique 4MB SGRAM PCI VGA 3D Labs Permedia II 8MB SGRAM AGP VGA ATI Rage Pro 4MB SGRAM AGP VGA
<b>VGA Driver For 95</b>	Mystique Windows 95 Driver Version 4.03.00.3700 3D Labs Permedia II Windows 95 Driver Version 4.03.00.2102-0169 ATI Rage Pro Windows 95 Driver Version 4.10.2229
<b>VGA Driver For NT</b>	Mystique Windows NT Driver Version 3.20,4.0.032 3D Labs Permedia II Windows NT Driver Version 21010152C2
<b>IDE Driver</b>	Intel PIIX4 IDE Bus Master Driver Version 3.0 For Windows 95
<b>IDE HDD</b>	IBM DHEA-36480 Ultra DMA/33 6.4GB HDD
<b>Memory</b>	32MB SDRAM DRAM
<b>Operating System</b>	Microsoft Windows 95 SR2 2.1(4.03.1214) Microsoft WindowsNT 4.0 Workstation with Service Pack 3

## 2.0 System Benchmarks Performance Summary

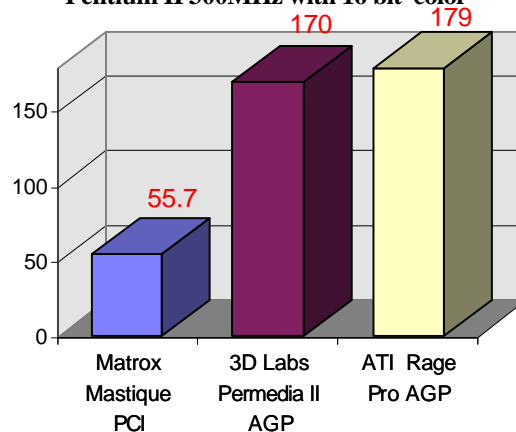
### a) Benchmarks Performance for Windows 95:

The chart below illustrates the Winstone 97 / 3D WinBench 97 under Windows 95 performance processor benchmark with the KL-6011 using Intel Pentium II 266/300MHz processors. The following is a sample of the results using 512KB Pipeline Burst SRAM, 32MB SDRAM DRAM, with a Matrox Mystique PCI VGA/3D Labs Permedia-II/ATI Rage Pro AGP VGA card in 1024 x 768 x 256/16bit colors(3D WinBench 97 use 16bit color), resolution refresh rate of 75Hz, small font.

### KL-6011 Winstone 97 Performance Pentium II 300MHz with 256 color



### KL-6011 3D WinBench 97 Performance Pentium II 300MHz with 16 bit color

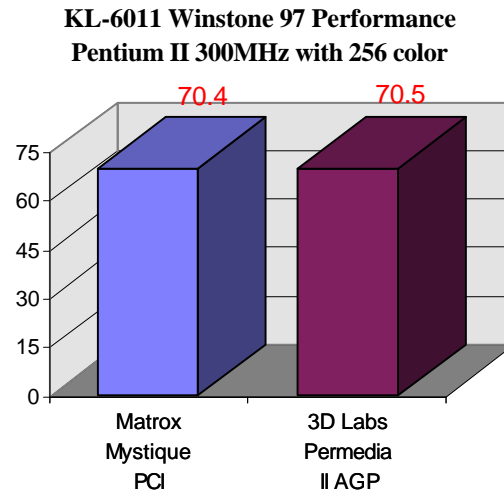


The table below provides more detailed benchmark testing data about the KL-6011 using different speed Intel Pentium processors. The board was configured with 512KB Pipeline Burst SRAM and 32MB SDRAM DRAM.

Benchmarks	Weighted Suite	Pentium II-266MHz			Pentium II-300MHz		
		Matrox	3D Labs	ATI	Matrox	3D Labs	ATI
<b>WinStone 97</b>	Business Winstone 97	56.1	55.1	57.4	58.7	58.8	59.4
	High/End Winstone97	26.5	24.1	26.3	28.7	27.4	27.2
<b>WinBench97</b>	Business Disk WinMark 97	1400	1320	1360	1390	1360	1410
	H/E Disk WinMark 97	5410	5330	5400	4810	5040	5560
	CPUMark 16	522	521	521	591	586	586
	CPUMark 32	684	687	678	773	761	770
	Business Graphics WinMark 97	97	96.3	120	107	105	133
	H/E Graphics WinMark 97	49.8	38.6	52.3	56.1	41.6	57.7
<b>3D WinBench 97</b>	3D Winmark	53.9	159	163	55.7	170	179
	3D Scene/User Defined	0.876	20.5	21.1	0.876	22.1	23.1

### b) Benchmarks Performance for Windows NT 4.0 :

The chart below illustrates the Winstone 97 under Windows NT 4.0 performance processor benchmark with the KL-6011 using Intel Pentium II 266/300MHz processors. The following is a sample of the results using 512KB Pipeline Burst SRAM, 32MB SDRAM DRAM, with a Matrox Mystique PCI VGA/3D Labs Permedia-II AGP 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 KL-6011 using different speed Intel Pentium processors. The board was configured with 512KB Pipeline Burst SRAM and 32MB SDRAM DRAM.

Benchmarks	Weighted Suite	Pentium II - 266MHz		Pentium II - 300MHz	
		Matrox	3D Labs	Matrox	3D Labs
<b>WinStone 97</b>	Business Winstone 97	66.3	67.9	70.4	70.5
	High/End Winstone97	23.9	22.4	24.6	23.3
<b>WinBench97</b>	Business Disk WinMark 97	958	921	922	910
	H/E Disk WinMark 97	2450	2460	2490	2490
	CPUMark 16	510	514	579	562
	CPUMark 32	697	695	785	784
	Business Graphics WinMark 97	122	136	133	151
	H/E Graphics WinMark 97	59.5	59	65.3	65

## 2.1 Memory Configurations

This table measures the performance of the KL-6011 using different memory sizes of 32MB and 64MB. The tests were done on a board featuring an Intel Pentium II 300MHz processor, 512KB Pipeline Burst Cache and SDRAM Main Memory.

Benchmarks	Weighted Suite	32MB SDRM			64MB SDRAM		
		Matrox	3D Labs	ATI	Matrox	3D Labs	ATI
Winstone 97	Business Winstone 97	58.7	58.8	59.4	64.5	63.1	65.7
	High End Winstone 97	28.7	27.4	27.2	33.0	30.4	31.9
Winbench 97	Business Disk WinMark 97	1390	1360	1410	2150	2140	2220
	High End Disk WinMark 97	4810	5040	5560	8910	8560	8960
	CPUmark 16	591	586	586	589	587	586
	CPUmark 32	773	761	770	775	768	768
	Business Graphics WinMark 97	107	105	133	107	106	134
	High End Graphics WinMark 97	56.1	41.6	57.7	56.1	41.7	57.9
3D WinBench 97	3D Winmark	55.7	170	179	55.7	170	179
	3D Scene/User Defined	0.876	22.1	23.1	0.876	22.1	23.1

## 2.2 Graphics Benchmarks Performance Summary For Win 95

illustrates the 3D Winbench 97 under Windows 95 Performance graphics benchmark with the **KL-6011 V1.0** using different AGP 3D VGA Cards. The following is a sample of the results under **Pentium II-300 MHz** **512K L2 Cache**, **32M DIMM** memory on system, and **resolution set to 800x600 16bpp**, refresh rate **72Hz**, small font.

\*The BenchMark test result is for reference only. AGP VGA Chipset and drivers are beta version.

BIOS : AMI BIOS Version 627B102

O.S : Windows 95 OSR2.1 Version.4.03.1214

Dirrect X : Version 5.0 Beta 2 V4.05.00.0129

IDE HDD : Quantum Fireball\_TM3 3200AT With Intel PIIX4 IDE Bus Master Driver Version 3.0

Application : 3D Winbench 97 V1.0 with Station 2 Large Texture.sdl

**3D Winbench 97 3D Quality test**

<b>3D Winbench Mark 97 Function List</b>	<b>ATI 3D Rage Pro A4</b>	<b>3D Labs Permedia 2</b>	<b>Cirrus 5465</b>	<b>Trident 985</b>
<b>BIOS</b>	V3.072	V1.27	V1.57a	GU 6.1
<b>Driver</b>	4.10.2222 (4.30-B9H)	4.03.00.2102 -0182	4.10.01.0160- 1.60.db	4.04.6666 (V1616)
<b>Video Memory</b>	4M SGRAM	4M SGRAM	4M RAM Bus	4M RAM Bus
<b>Fog Vertex</b>	✓	✓	✓	✓
<b>Fog Table</b>				
<b>Specular Highlights</b>	✓	✓	✓	✓(Bad)
<b>Color Key Transparency</b>	✓(Bad)	✓	✓	✓
<b>Alpha Transparency</b>	✓		✓	Failure
<b>Linear</b>	✓	✓	✓	✓
<b>Mipmap Linear</b>	✓	✓		✓
<b>Dithering</b>	✓	✓	✓	✓
<b>Perspective Correction</b>	✓	✓	✓(Bad)	✓(Bad)
<b>Fog Vertex and Color Key</b>	✓(Bad)	✓	✓	✓
<b>Fog Vertex and Alpha</b>	✓(Bad)		✓	Failure
<b>ReMark</b>				Installati on None ready

✓ : Function Available

Bad : Quality Bad

Failure : Has error message apply



VGA Cards	ATI Rage Pro	3D Labs Permedia 2	Cirrus 5465	Trident 985
<b>3D Winbench 97 V1.0</b>				
<b>3D Winbench Mark 97</b>	164	196	123	133
<b>3D Scene/User Define (640x480 16bpp) Frames/sec</b>	20.4	23.6	Hang	11.9 (Has Garbage)
<b>3D Scene/User Define (800x600 16bpp)</b>	19.5 (Quality Bad)	19.3	Hang	Hang (Quality Bad)
<b>3D Scene/User Define (1024x768 16bpp)</b>	×	×	×	×
<b>3D Triangle/User Define (640x480 16bpp) Triangles/sec</b>	197	259	134	83.9 (Has Garbage)
<b>3D Triangle/User Define (800x600 16bpp)</b>	199	238	134	79.8 (Has Garbage)
<b>3D Triangle/User Define (1024x768 16bpp)</b>	×	×	×	×
<b>Winstone 97 V1.0</b>				
<b>Business Winstone97</b>	54.8	55.9	53.3	53.1
<b>High-End Winstone97</b>	24.5	24.2	23.7	22.5
<b>Winbench 97 V1.0</b>				
<b>Business Graphics Mark97</b>	133	128	123	120
<b>High-End Graphics Mark97</b>	56.7	51.4	42.1	Time out
<b>Direct X5 3D Test By Ramp Emulation (800x600 16bpp)</b>				
<b>Fill Rate (mpps)</b>	8.64	9.07	8.20	8.44
<b>Polygon Throughput (kpps)</b>	528.24	532.07	528.24	527.09
<b>Intersection Throughput (kpps)</b>	2.17	2.27	2.10	2.13
<b>Direct X5 3D Test By Direct3D HAL (800x600 16bpp)</b>				
<b>Fill Rate (mpps)</b>	29.44	23.12	Fail	11.62
<b>Polygon Throughput (kpps)</b>	413.66	1017.17	Fail	464.91
<b>Intersection Throughput (kpps)</b>	5.55	6.83	Fail	2.30
<b>Direct X5 3D Test By MMX Emulation (800x600 16bpp)</b>				
<b>Fill Rate (mpps)</b>	6.34	6.53	5.25	5.89
<b>Polygon Throughput (kpps)</b>	359.79	358.30	325.87	340.75
<b>Intersection Throughput (kpps)</b>	1.62	1.72	1.50	1.57
<b>ReMark</b>				

