

# Thermal Test Report

Model Name: **RM223**



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## 1. Executive Summary of Results

The Chenbro Micom [RM223 Rackmount](#) Chassis provides adequate cooling for the [Intel SE7221BK1-E](#) board with [two Western Digital 100GB 7,200 rpm ATA-100 IDE Hard Drives](#), [two Western Digital SATA 150 250G Hard Drives](#) and [one 3.8GHz Intel P4 Prescott LGA 775](#) processors.

Thermal Test	Test Results
Processor	PASS

Table 1 – Summary of Results

## 2. Introduction

The purpose of this test is to ensure that the design of tested chassis model can pass the thermal goal under specific configuration which is either inquired or the most critical one.

The components examined during this test are processors. The Room Ambient Temperature (T-Room) is specified to 35 degree C.

This report has defined test configuration, test setup, test procedures and all the relevant modifications. The test result would be valid only when the same circumstance has been applied.

The test was done by Chenbro Micom Co., Ltd. which is located at following address:

15Fl., No.150,Jian Yi Road, Chung Ho City, Taipei Hsien, Taiwan, R.O.C.

## 3. Test Configuration

The tested system configuration is as following.

Component	Manufacturer	Model Number	Q'ty	Specification
Chassis	Chenbro	RM223	1	Rackmount chassis
Main Board	Intel	SE7221BK1-E	1	Full function
CPU Type	Intel	3.8GHz P4 Prescott	1	Single Socket LGA 775
Memory	Micron	MT8HTF3264AG-53EB3	1	DDR2 256MB REG PC4300 CL4
Chipset	Intel	E7221 chipset	1	Full Function
VGA (on board)	Intel	E7221 chipset	1	On board
LAN (on board)	Intel	82541PI	1	10/100/1000 Mbps Controller
Hard Drive	Western Digital	WD1000	2	ATA/100 7200 RPM 100GB
Hard Drive	Western Digital	WD2500JD-50GBB0	2	SATA 150 250GB
CD-ROM	Aopen	CD-950E/TKU	1	50X speed
PSU	FSP	FSP550-60PLG	1	550W with PFC
HDD Cooling Fan (Rear)	Y.S.	FD126025HB	1	60x60x25/4300 RPM
System Fan (Rear)	Sanyo Denki.	109P0412J3013	2	40x40x28/12500 RPM
System Fan (Front)	SEI	A8025B12UD	2	80x80x25/4200 RPM
SATA (on board)	Intel	ICH6R	4	SATA Connector
CPU Cooler	CoolJag	Engineer Sample	1	Active Heatsink (side flow)

Table 2 – System Configuration

#### 4. Chassis Description (as Tested)

The RM223 chassis is a Rackmount Server chassis that may ship with a FSP 550W power supply (optional) and five system fans. It has one exposed standard CD-ROM drive bay, one exposed standard FDD drive bay and four 3.5" HDD internal drive bays.

The dimensions of this chassis are 19.4"D x 16.6"W x 3.5"H.

The chassis is manufactured by Chenbro Micom Co., Ltd. which is located at following address:

15Fl., No.150,Jian Yi Road, Chung Ho City, Taipei Hsien, Taiwan, R.O.C.

#### 5. Test Equipment Used

##### Thermal Chamber

The thermal chamber's picture is as following. This thermal chamber can control the Room Ambient Temperature (T-Room) at 35 degree C.

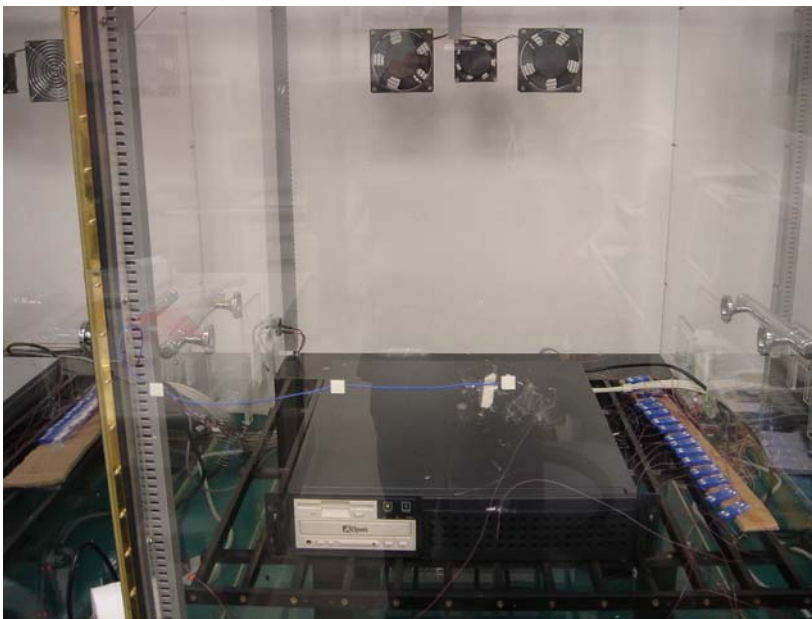


Fig. 1 – Thermal Chamber

##### Thermocouples

T-type, 36AWG thermocouples are attached to the components.

##### Data Acquisition System

The picture of Data Acquisition System is as following. The Data Acquisition System includes one Agilent 34970A, 48 channel temperature recorder and one PC for logging the measured temperature data. The communication interface between recorder and PC is RS-232C.



Fig. 2 – Data Acquisition System

## 6. Support Software

The following software was used in this test.

- ♦ [Maximum Power Program for the Prescott Processor V1.4.2](#)
- ♦ [I/O Meter. Rev.2003.05.10](#)
- ♦ [Agilent BenchLink Data Logger Rev.1.5.030305.](#)
- ♦ [Intel Frequency Display](#)
- ♦ Windows 2000 Server (English version)

## 7. Test Setup and Procedure

- ♦ Installation of the tested system
- ♦ Installation of the operating system with device drivers
- ♦ Installation of the stress software utilities
- ♦ Installation of the thermocouples
- ♦ Place the tested system into thermal chamber
- ♦ Power up the tested system
- ♦ Run the processor stress utility at **85%** loading for both processors
- ♦ Run the utilities of the other devices such as HDD for simulating maximum loading
- ♦ Run the Data Logging Software to record the measurements
- ♦ Power on the process controller on the thermal chamber and control the room ambient at 35 degree C
- ♦ After the measured temperatures are settled, record the test duration and analyze the measurements.

## 8. Test Results

### Summary

- With [Maximum Power Program for the Prescott Processor V1.4.2](#) running, the case temperature of processors did not exceed the specification for the [3.8GHz Intel P4 Prescott LGA 775](#) processor under specified configuration. **Intel Frequency Display window did NOT have the instant warning message** (to present the over-heat status includes message color changed).

### Detail

Measured Points	Max. Specified Temp Limit (deg C)	Measurements @35 deg C	Compensated Data* (deg C)
1.T-CASE	Reference	70.3	69.8
2.T-A1	Reference	41.7	41.2
3.VRM	105	66.3	65.8
4.Memory	70	54.7	54.2
5.North Bridge	99	52.2	51.7
6.South Bridge	115	73.6	73.1
7.HDD	55	42.8	42.3
8.SATA HDD	55	51.4	50.9
9.T-ROOM	35	35.5	35.0

Table 3 – Detail of Test Results

\*Compensated Data = Measurement+(35-T-Room)  
 = Measurement+(35-35.5)  
 = Measurement -0.5

**Test Duration:** [24 hours](#).

## 9. Conclusion

The [RM223](#) chassis (as tested) does provide adequate cooling for the [3.8GHz Intel P4 Prescott LGA 775](#)processors.

The maximum temperature of processor, which was at [85%](#) loading of processor stress utility under 35 degree C room ambient. The most important part of the test result was that Intel Frequency Display window did NOT present the warning message.

The tested system does not necessarily represent the absolute worst-case that the system is subject to.

The system is not maximally loaded with add-in cards and their associated cables that could cause the internal temperatures to increase and reroute airflow.

**10. Appendix A - System Setup**

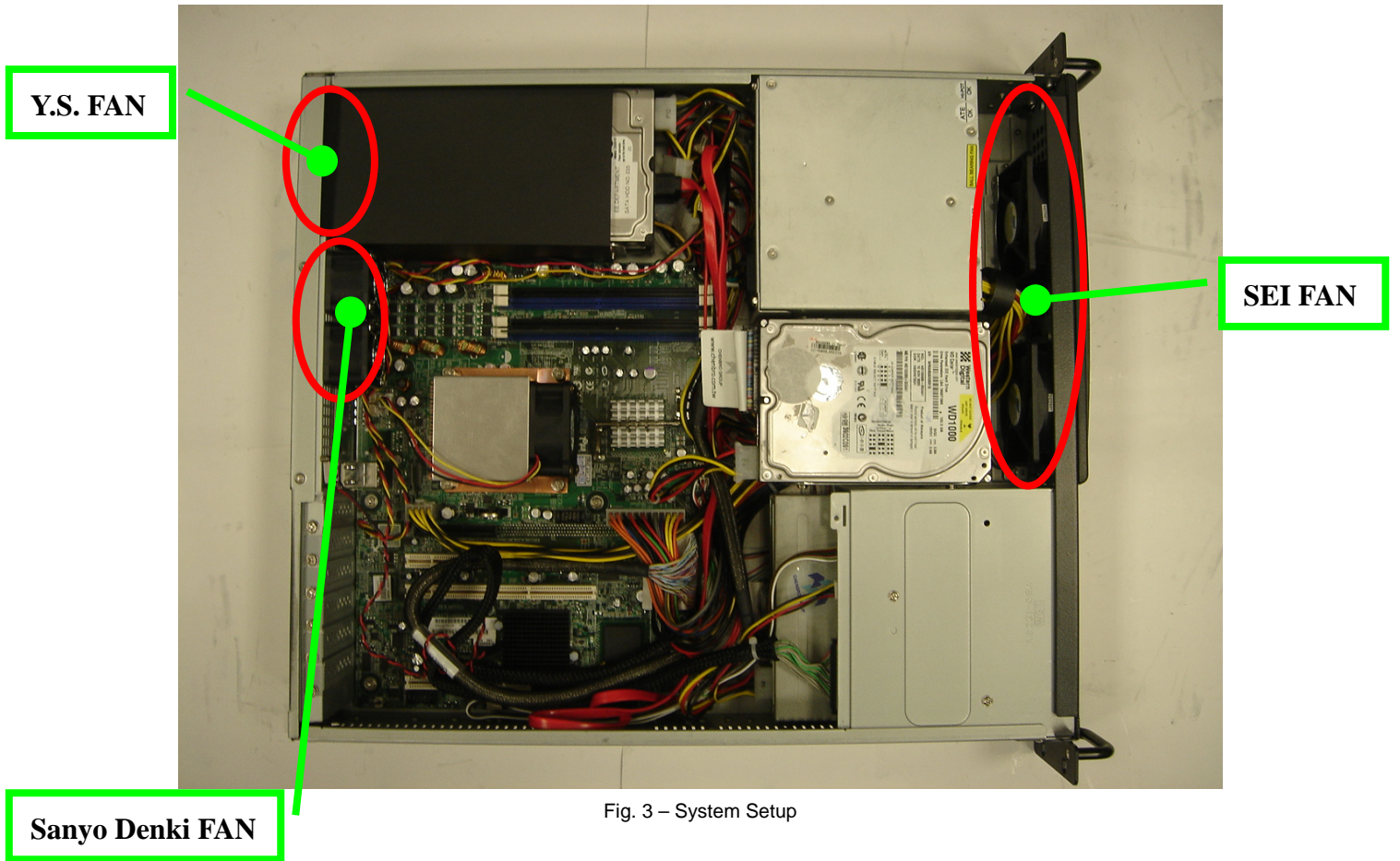


Fig. 3 – System Setup

### 11. Appendix B - Measured Points

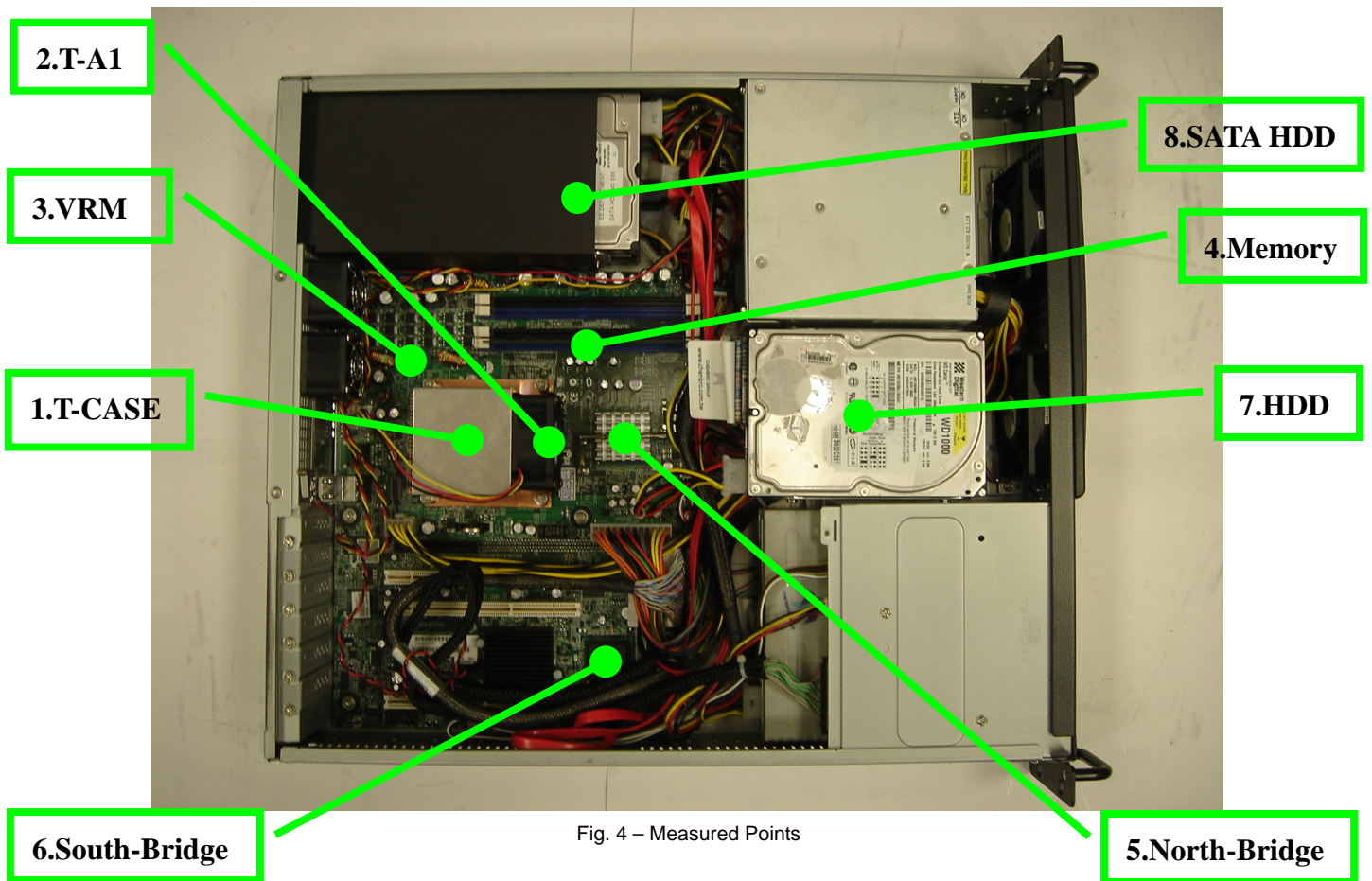


Fig. 4 – Measured Points

9.T-ROOM



## 12. Appendix C - Real-Time Trend

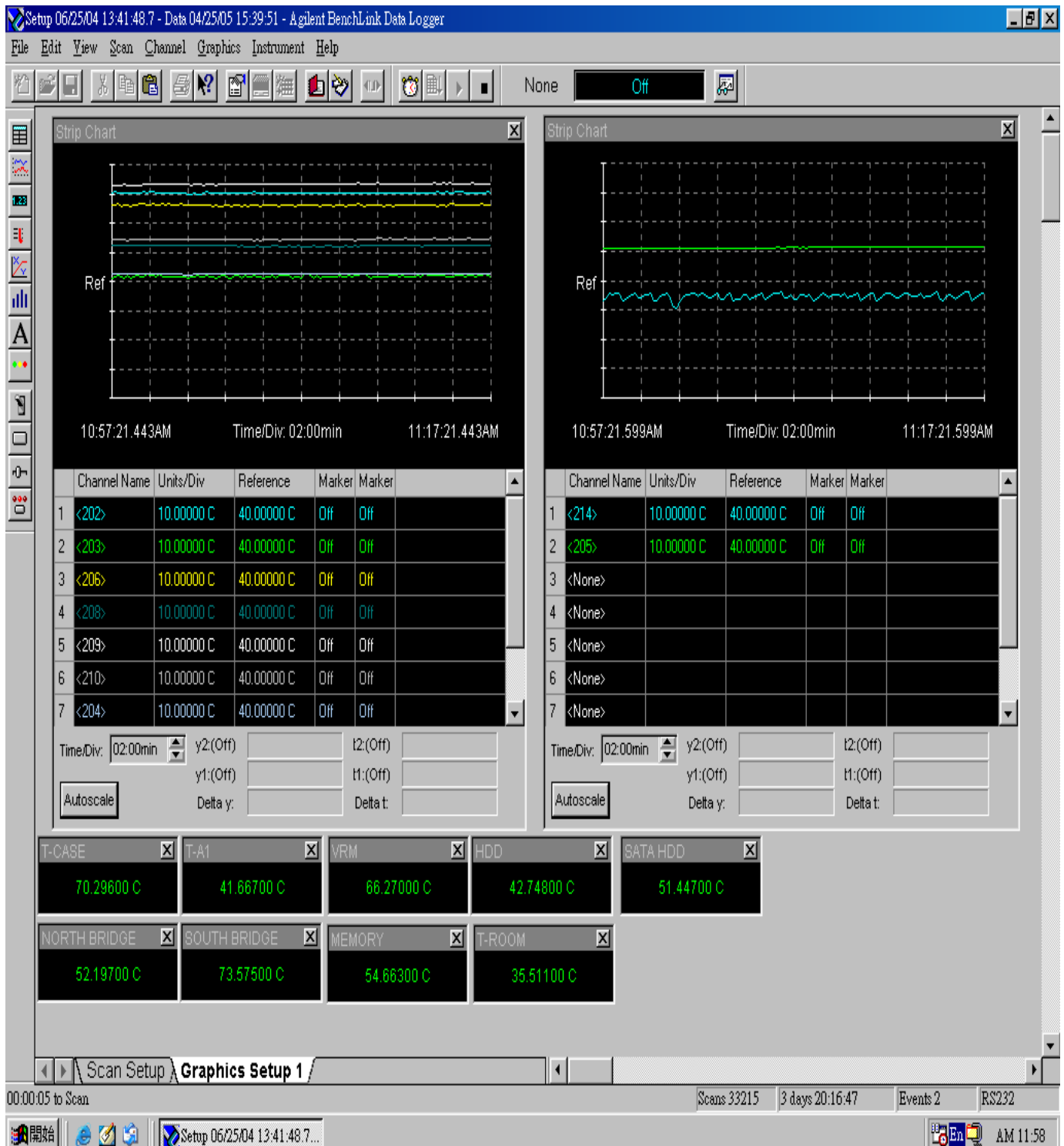


Fig. 5 – Real-time Trend

### 13. Appendix D - Intel Frequency Display

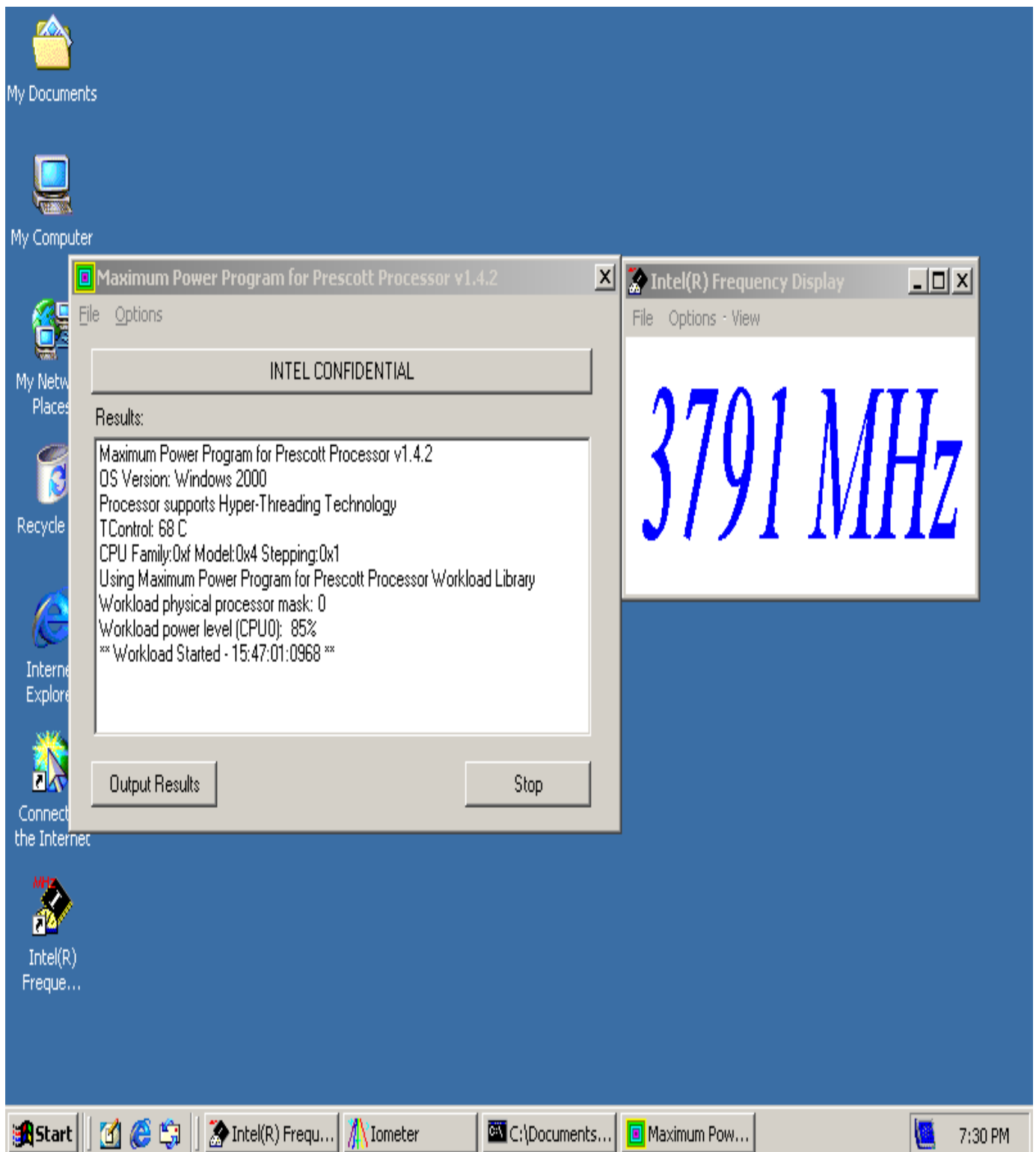


Fig. 6 – Intel Frequency Display