



GT3-BH Technical Whitepaper “iProfessional” Test Data on a Typical Workstation GT3-PC System Build Version 1.0

The “iProfessional” PC configuration as detailed below, represents a typical high-end GT3 PC configuration optimized for Professional “Workstation” use, utilizing GTR's GT3-BH Chassis. The below data includes an exhaustive component list, necessary system settings, configuration details, including acoustic, thermal, performance, and power consumption data.

Configuration Objective: Maximize system stability and performance for professional work environments.

Configuration Overview

- ✓ Quiet: 41.5dB(silent = 38.5dB)
- ✓ Low Power Consumption: 119Watts typical, 203Watts Max
- ✓ High Performance
 - ✓ Windows Experience Index - Processor, Memory of 7.4 and 7.5, respectively.
 - ✓ 13,732 3DMark '06 Score

System Configuration

- 1 x GTR Tech GT3-BH
- 1 x Intel Core i7 920 Nehalem 2.66GHz 4 x 256KB L2 Cache 8MB L3 Cache LGA 1366 130W Quad-Core Processor
- 1 x ASUS P6T LGA 1366 Intel X58 ATX Intel Motherboard
- 1 x OCZ Gold 12GB (6 x 2GB) 240-Pin DDR3 SDRAM DDR3 1333 (PC3 10666) Desktop Memory
- 1 x XFX HD-485X-ZDFC Radeon HD 4850 1GB 256-bit GDDR3 PCI Express 2.0 x16 HDCP Ready CrossFire Supported Video Card
- 2 x Western Digital VelociRaptor WD3000HLFS 300GB 10000 RPM 16MB Cache SATA 3.0Gb/s 3.5" Internal Hard Drive
- 1 x Sony Optiarc Black 8X Slot Loading DVD Burner
- 4 x SilenX IXP-13-14 40mm Case Fan
- 1 x Circuit Assembly Slimline SATA Cable SlimSATA Cable – SKU U709089-0.5M
- Windows 7 x64 RC Build 7057

<i>CPU Settings</i>	<i>Memory Settings</i>	<i>Misc. Motherboard</i>
CPU set to default settings(2.66Ghz)	Memory set to default settings: 1066(DDR)	BIOS Version: 0502 Fan Control in BIOS set to “Silent”

<i>Build Notes</i>
- Video card air-flow outlet, adjacent to video card's 6-pin power connector, blocked to improve through-the-chassis, air-flow. This was done using High Temp 3M tape. Effective loaded GPU temperature dropped 5 degrees Celsius as a result.
-Lower bracket on feature module and lower support bracket on chassis removed to accommodate video card length.

CONFIGURATION DATA RESULTS

Reference Data(Power Off, Quiet Office)

Test environment: a typical office environment, measured “silent” at 38.5dB; no appliances running, A/C, Fans, computers, etc.

Power Consumption: 1.3Watts

Office environment in dB, as measured “quiet”: 38.5dB

Ambient Room Temperature: 78-80F

Humidity: 40-50%

Windows 7 Software/Drivers: All device drivers installed by Windows 7, video card drivers: Catalyst 9.3 Beta

Usage Model 1 – Desktop Use

Windows 7 Experience Index Base Score: 5.9

Processor: 7.4

Memory: 7.5

Graphics: 5.9

Gaming Graphics: 6.5

Primary Hard Disk: 5.9

Typical Power Consumption: 119Watts

Max Acoustics: 41.5dB

Max CPU Core Temperature: 43.0C

Max Graphics Core Temperature: 42.0C

Usage Model 2 – Hardware-Accelerated 3D Graphics

(3DMark '06, Default Settings)

3DMark '06 Score – 13,732 Marks

Max Power Consumption: 203Watts

Max Acoustics: 46dB

Max CPU Core Temperature: 66.0C

Max Graphics Core Temperature: 56.0C

Usage Model 3 - Non-Conforming Usage Model, Synthetic Test

(“The Crusher-Tribute” Test*)

Max Power Consumption: 293Watts

Max Acoustics: 48.2dB

Max CPU Core Temperature: 79.0C

Max Graphics Core Temperature: 60.0C

CONCLUSIONS AND OBSERVATIONS

General Conclusions and Observations

1) Actual power consumption data illustrate the disparity between real world power supply requirements versus consumer's perceived needs and vendor's power supply recommendations, ie vendor recommendations for this system include 450 to 550 Watt power supplies([Nvidia](#), [ATI](#)). Whereas, this system consumes no more than 205 “real world” Watts and 293 “synthetic” Watts.

2) GT3 supports all processors in the market, to date. Intel provides actual power requirement data for processor support([Reference](#)), AMD does not(4/19/09 - [AMD1](#), [AMD2](#)). Therefore, Intel processor support is explicit and AMD support is implicit, meaning AMD processors do not exceed GT3's power supply output.

Intel:

GT3's Power supply conforms to Intel's Core i7 Power Supply Requirements: "The Intel Core i7 processor requires a minimum of 8 Amps continuous and 13 Amps peak for 10ms on 12V2"([Reference](#)). GT3's Power Supply provides 8.5A continuous and 16.0A peak on the 12V2 rail****.

AMD:

No known GT3-PC AMD based builds exceed or come close to, under “real world” or “synthetic” workloads, GT3 Power Supply's maximum system configuration of 454Watts of A/C Outlet power consumption***.

3) GT3's Power Supply's maximum output is 370 Watts with a resulting efficiency of 78.1%**.
Resulting in a maximum system configuration of 454Watts of A/C Outlet power consumption***.

3) Motherboard Manufacturers Asus and Gigabyte provide proper fan control to optimize thermal and acoustic efficiency based on system load.

3a) Gigabyte's fan control implementation, controls **one** “Sys Fan” header. Therefore, both upper and lower GT3 intake fans need to be connected to this header.
Use [1 x Cables To Go #27391](#) adaptor to run both fans to this fan header.

3b) Asus' fan control, successfully controlled both upper and lower fans when connected two two different fan header connectors.

4) By implementing a system build with effective fan control, acoustics under desktop use drop from the mid to high 40dB range, to the hi 30dB range – virtually silent, ideal for office use.

5) Hard drives are a significant contributor to overall noise levels and inhibits a distraction-free compute environment. Choose your hard drive carefully if acoustics are a factor for your GT3 PC build. The hard drives used in these Technical Whitepapers consist of GTR's recommendations.

Specific Conclusions and Observations

1) Though improving thermal efficiency, installing four, 40mm fans, in the back of this GT3 Computer Build, was not thermally necessary.

2) System would not pass the “Crusher-Tribute” test with increased memory frequencies.

APPENDIX

*GTR's "Crusher-Tribute" Test

(Note: this test is a tribute to the best benchmark of all time, its just a tribute)

Prime 95 " In Place Large FTTs" executed in parallel with 3DMark '06 tests "GT2" and "HDR2" in loop mode.

3DMark 06 Tests: GT2 - Firefly Forest, HDR2 – Deep Freeze executed with "Loop All Selected Tests"
Test executed for 60 Minutes

**Maximum Power Supply Output Measured at 25C(Link)

***Power Consumption Calculation Data

	GT3's Power Supply Power Output						Total
Power Rail	+3.3v	+5v	+12v1	+12v2	-12v	+5vsby	
DC Voltage	3.3	5	12	12	12	5	
Amps	20	17	8.5	8.5	0.5	2.5	57.00
Watts	66	85	102	102	6	12.5	373.50
Efficiency							78.41%
Wall consumption							454.14

***GT3 Power Supply Specification(Link)