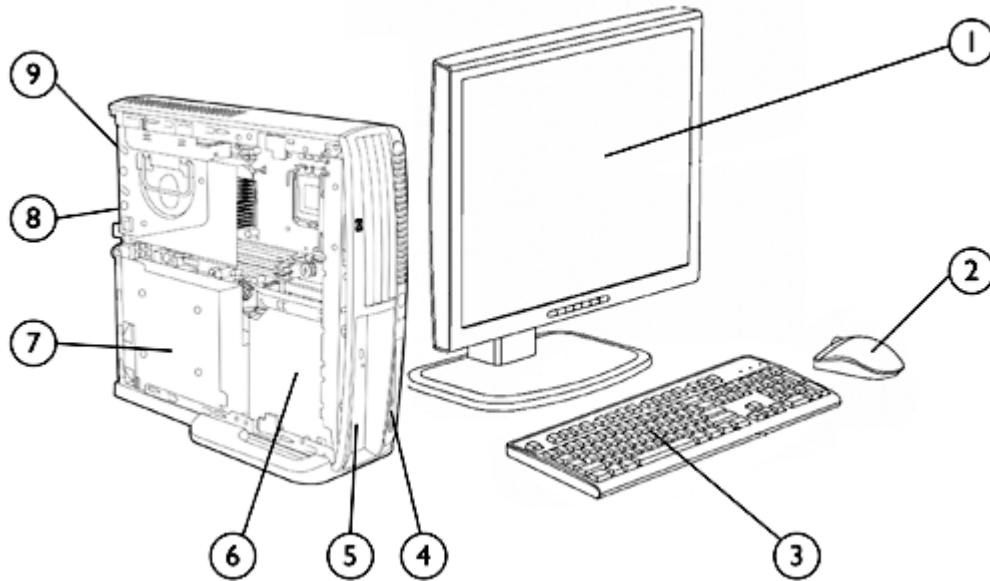# QuickSpecs

Overview

**HP recommends
Windows Vista® Business**
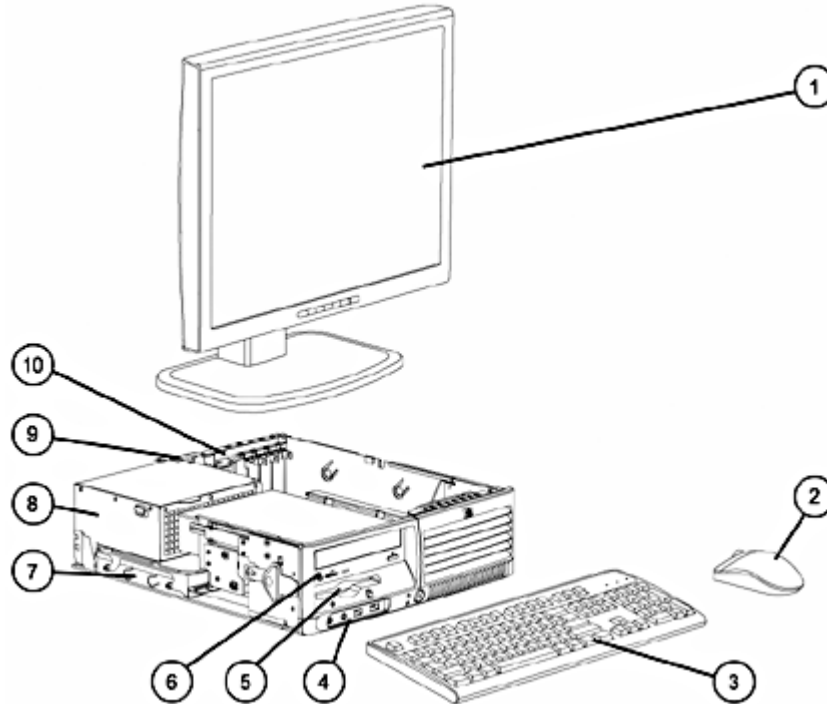
Ultra-slim Desktop

1. Monitor (sold separately)
2. 2-Button Scroll Mouse (PS/2) or Optical Scroll Mouse (PS/2 or USB)
3. HP Standard Keyboard (PS/2 or USB) or HP USB Smartcard Keyboard
4. Front I/O: (2) USB 2.0, headphone and microphone
5. (1) Slimline Drive Bay

6. (1) 3.5" internal bay
7. 200-watt Active Power Factor Correction (PFC) power supply
8. (1) full-height PCI slot (requires optional PCI riser), (1) low profile PCI Express x16 slot (requires optional PCIe x16 riser)*
9. Rear I/O: (6) USB 2.0, (1) optional serial port (available via adapter), (1) optional parallel port (available via adapter), (1) optional DVI graphics port (available via DVI ADD2 adapter), (2) PS/2, (1) RJ-45, (1) VGA, audio in/out

* Only one optional PCI riser card (the PCI riser or the PCI Express x16 riser) or one PCI Serial and parallel I/O adapter is allowed.

Overview

Small Form Factor

1. Monitor (sold separately)
2. 2-Button Scroll Mouse (PS/2) or Optical Scroll Mouse (PS/2 or USB)
3. HP Standard Keyboard (PS/2 or USB) or HP USB Smartcard Keyboard
4. Front I/O: (2) USB 2.0, headphone and microphone
5. (1) 3.5" external bay for optional HP 16-in-1 Media Card Reader, diskette drive, or other 3.5" device
6. (1) 5.25" external bay for optional optical drive, or other 5.25" device (bay tilts up for device removal and insertion)

7. (1) 3.5" internal bay
8. 240-watt or 240-watt high efficiency 80 PLUS® Active Power Factor Correction (PFC) power supply
9. Rear I/O: (6) USB 2.0, (1) standard serial port, (1) optional serial port, (1) parallel port, (2) PS/2, (1) RJ-45, (1) VGA, (1) optional DVI graphics port (available via DVI ADD2 adapter), audio in/out
10. (2) low profile PCI slots, (1) low profile PCI Express x1 slot, (1) low profile PCI Express x16 slot; (2) full-height PCI slots optional (require PCI riser card)*

* With riser card option, PCI Express x1 and x16 slots are inaccessible.
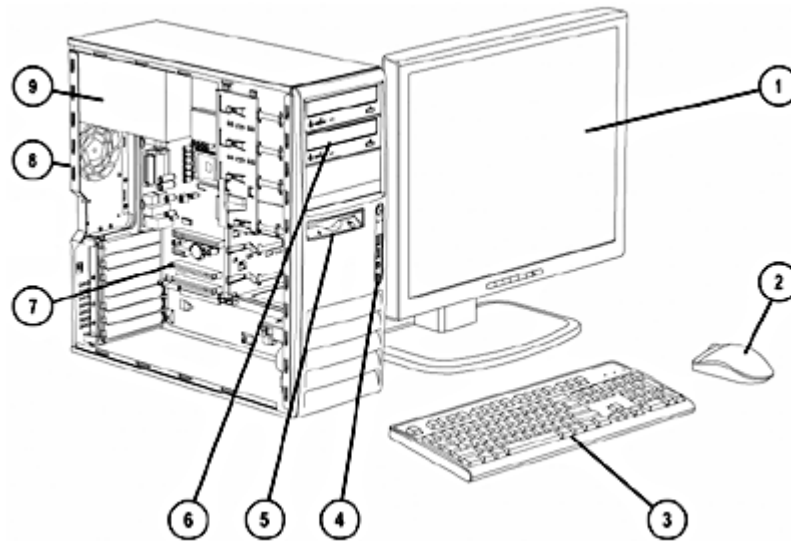
Overview

Convertible Minitower

1. Monitor (sold separately)
2. 2-Button Scroll Mouse (PS/2) or Optical Scroll Mouse (PS/2 or USB)
3. HP Standard Keyboard (PS/2 or USB) or HP USB Smartcard Keyboard
4. Front I/O: (2) USB 2.0, headphone and microphone
5. (1) 3.5" external bay for optional HP 16-in-1 Media Card Reader, diskette drive, or other 3.5" device
6. (3) 5.25" external bays and (2) 3.5" internal bays

7. (2) full-height PCI slots, (1) full-height PCI Express x1 slot, (1) full-height PCI Express x16 slot, (2) additional full-height PCI slots optional
8. Rear I/O: 6 USB 2.0, 1 standard serial port, 1 optional serial port, 1 parallel port, 2 PS/2, 1 RJ-45, 1 VGA, audio in/out, mic in

9. 365-watt or 365-watt high efficiency 80 PLUS Active Power Factor Correction (PFC) power supply
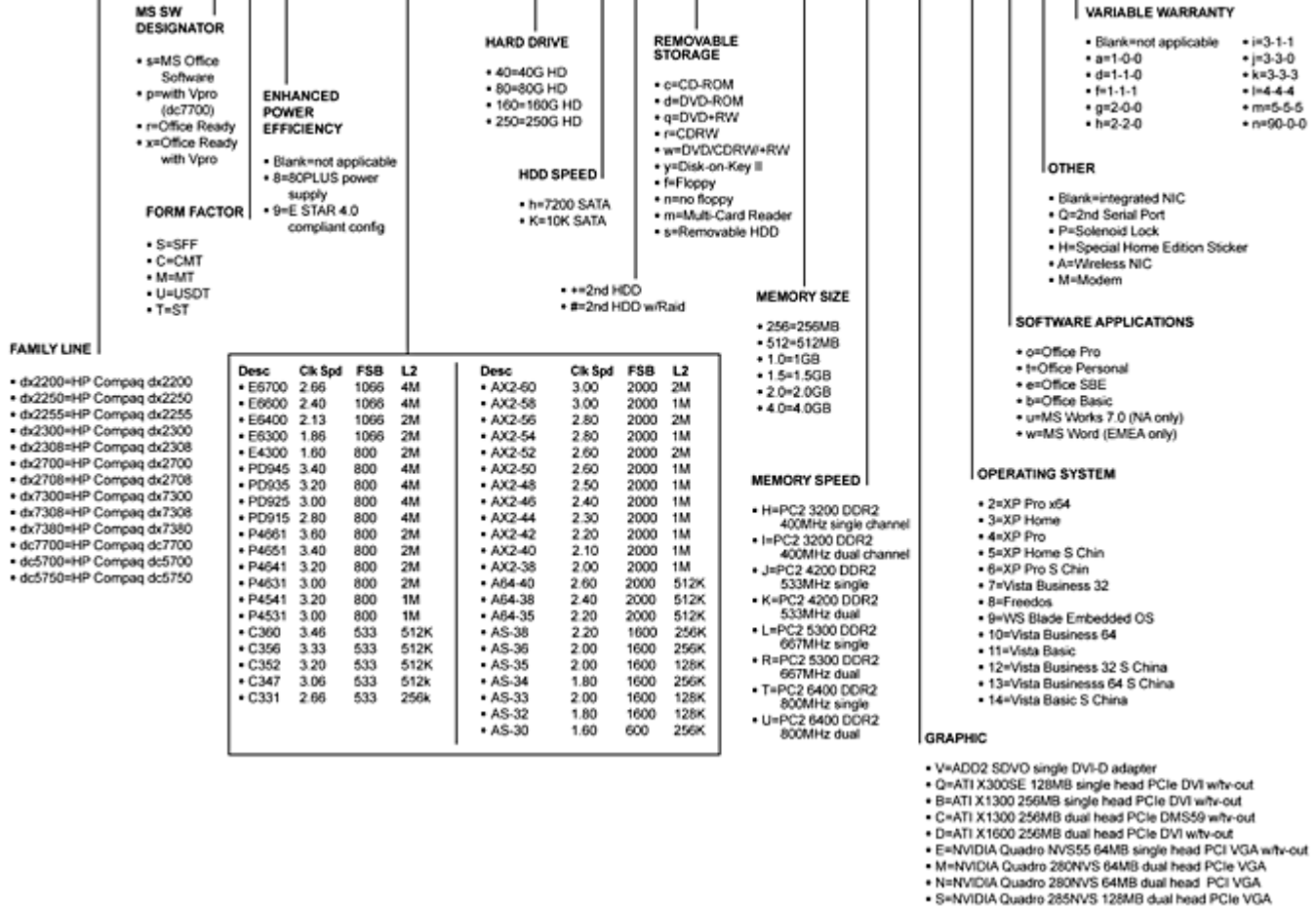
Overview

At A Glance

- Designed for long-term, networked deployment within medium and large organizations in commercial business, finance and public sector industries
- Created using industry leading Design for Environment standards. Upgradeable, recyclable and energy efficient.
- Long purchase lifecycles and image stability for demanding enterprise environments
- Support for new Intel technologies introduced in 2006: Intel® Q965 Express chipset, Intel Core™ 2 Duo Processors, and Intel Graphics Media Accelerator 3000 integrated graphics
- Select models with new Intel vPro technology support the latest in manageability and security technology
- Value-added software on select models
  - ○ HP Total Care Advisor
  - ○ HP ProtectTools Security Software Suite, including embedded security, preinstalled standard
  - ○ HP Backup and Recovery Manager
  - ○ HP Software Agent
  - ○ Altiris Deployment Solution Agent
  - ○ Symantec AntiVirus 10.0 with 60 day Live Update Subscription
  - ○ HP Insight Diagnostics software
  - ○ Microsoft Office 2007
  - ○ PDF Complete
  - ○ Computrace for Desktops
- Value-added software available for free download from the Web (http://www.hp.com/go/easydeploy)
  - ○ HP Client Configuration Manager, Basic Edition
  - ○ HP Out-of-Band Management Console (for Intel AMT enabled models)
  - ○ HP Client Manager for Altiris
  - ○ Altiris Out-of-Band Management Solution (for Intel AMT enabled models)
  - ○ HP SoftPaq Download Manager
  - ○ HP System Software Manager
  - ○ HP Client Catalog for Microsoft SMS
  - ○ Verdiem Surveyor remote power management agent
- Fully compatible software OS image across all three models (Ultra-slim Desktop, Small Form Factor, and Convertible Minitower)
- HP BIOS for better security, manageability and software image stability
- Selected configurations with global availability easily set up and ordered through HP.com Business to Business portals (http://h10019.www1.hp.com/business-site/index.html)
- Tailored HP Factory Express deployment and lifecycle services available (http://h71028.www7.hp.com/enterprise/cache/97688-0-0-225-121.aspx)
- Protected by HP Services, including standard warranties up to 5-5-5 (terms and conditions vary by country; certain restrictions and exclusions apply).
- Security
  - ○ Embedded TPM1.2 compliant security module* (requires HP ProtectTools Embedded Security software), providing compatibility with future security features expected in Microsoft Vista
  - ○ Redundant Array of Independent Disks (RAID) 1 configurations to protect data against hardware failures
  - ○ HP Backup and Recovery Manager to protect data against software corruption or incompatibilities due to patching or upgrades
- Tool-less serviceability features for easier upgrades and repairs
- Choice of professional chassis form factors to accommodate the desired mix between expandability and size

Configurable Components - Select Models (localized by Regions)

Model Key and Example

NOTE: This diagram is an example that illustrates how to read the model number. It is not intended to give every available configuration choice specified in the body of this document and may include references to modules that are out of date and no longer available.

dc7700pC8/E6300/250h+nyr/512H/S11tQk

MS SW DESIGNATOR
- s=MS Office Software
- p=with Vpro (dc7700)
- r=Office Ready
- x=Office Ready with Vpro

FORM FACTOR
- S=SFF
- C=CMT
- M=MT
- U=USDT
- T=ST

ENHANCED POWER EFFICIENCY
- Blank=not applicable
- 8=80PLUS power supply
- 9=E STAR 4.0 compliant config

HARD DRIVE
- 40=40G HD
- 80=80G HD
- 160=160G HD
- 250=250G HD

HDD SPEED
- h=7200 SATA
- K=10K SATA

- +=2nd HDD
- #=2nd HDD w/Raid

REMOVABLE STORAGE
- c=CD-ROM
- d=DVD-ROM
- q=DVD+RW
- r=CDRW
- w=DVD/CDRW/+RW
- y=Disk-on-Key II
- f=Floppy
- n=no floppy
- m=Multi-Card Reader
- s=Removable HDD

MEMORY SIZE
- 256=256MB
- 512=512MB
- 1.0=1GB
- 1.5=1.5GB
- 2.0=2.0GB
- 4.0=4.0GB

MEMORY SPEED
- H=PC2 3200 DDR2 400MHz single channel
- I=PC2 3200 DDR2 400MHz dual channel
- J=PC2 4200 DDR2 533MHz single
- K=PC2 4200 DDR2 533MHz dual
- L=PC2 5300 DDR2 667MHz single
- R=PC2 5300 DDR2 667MHz dual
- T=PC2 6400 DDR2 800MHz single
- U=PC2 6400 DDR2 800MHz dual

VARIABLE WARRANTY
- Blank=not applicable
- a=1-0-0
- d=1-1-0
- f=1-1-1
- g=2-0-0
- h=2-2-0
- i=3-1-1
- j=3-3-0
- k=3-3-3
- l=4-4-4
- m=5-5-5
- n=90-0-0

OTHER
- Blank=integrated NIC
- Q=2nd Serial Port
- P=Solenoid Lock
- H=Special Home Edition Sticker
- A=Wireless NIC
- M=Modem

SOFTWARE APPLICATIONS
- o=Office Pro
- t=Office Personal
- e=Office SBE
- b=Office Basic
- u=MS Works 7.0 (NA only)
- w=MS Word (EMEA only)

OPERATING SYSTEM
- 2=XP Pro x54
- 3=XP Home
- 4=XP Pro
- 5=XP Home S Chin
- 6=XP Pro S Chin
- 7=Vista Business 32
- 8=Freedos
- 9=WS Blade Embedded OS
- 10=Vista Business 64
- 11=Vista Basic
- 12=Vista Business 32 S China
- 13=Vista Businesss 64 S China
- 14=Vista Basic S China

GRAPHIC
- V=ADD2 SDVO single DVI-D adapter
- Q=ATI X300SE 128MB single head PCIe DVI w/tv-out
- B=ATI X1300 256MB single head PCIe DVI w/tv-out
- C=ATI X1300 256MB dual head PCIe DMS59 w/tv-out
- D=ATI X1600 256MB dual head PCIe DVI w/tv-out
- E=NVIDIA Quadro NVS55 64MB single head PCI VGA w/tv-out
- M=NVIDIA Quadro 280NVS 64MB dual head PCIe VGA
- N=NVIDIA Quadro 280NVS 64MB dual head PCI VGA
- S=NVIDIA Quadro 285NVS 128MB dual head PCIe VGA

FAMILY LINE
- dx2200=HP Compaq dx2200
- dx2250=HP Compaq dx2250
- dx2255=HP Compaq dx2255
- dx2300=HP Compaq dx2300
- dx2308=HP Compaq dx2308
- dx2700=HP Compaq dx2700
- dx2708=HP Compaq dx2708
- dx7300=HP Compaq dx7300
- dx7308=HP Compaq dx7308
- dx7380=HP Compaq dx7380
- dc7700=HP Compaq dc7700
- dc5700=HP Compaq dc5700
- dc5750=HP Compaq dc5750

Desc	Clk Spd	FSB	L2	Desc	Clk Spd	FSB	L2
E6700	2.66	1066	4M	AX2-60	3.00	2000	2M
E6600	2.40	1066	4M	AX2-58	3.00	2000	1M
E6400	2.13	1066	2M	AX2-56	2.80	2000	2M
E6300	1.86	1066	2M	AX2-54	2.80	2000	1M
E4300	1.60	800	2M	AX2-52	2.60	2000	2M
PD945	3.40	800	4M	AX2-50	2.60	2000	1M
PD935	3.20	800	4M	AX2-48	2.50	2000	1M
PD925	3.00	800	4M	AX2-46	2.40	2000	1M
PD915	2.80	800	4M	AX2-44	2.30	2000	1M
P4661	3.60	800	2M	AX2-42	2.20	2000	1M
P4651	3.40	800	2M	AX2-40	2.10	2000	1M
P4641	3.20	800	2M	AX2-38	2.00	2000	1M
P4631	3.00	800	2M	A64-40	2.60	2000	512K
P4541	3.20	800	1M	A64-38	2.40	2000	512K
P4531	3.00	800	1M	A64-35	2.20	2000	512K
C360	3.46	533	512K	AS-38	2.20	1600	256K
C356	3.33	533	512K	AS-36	2.00	1600	256K
C352	3.20	533	512K	AS-35	2.00	1600	128K
C347	3.06	533	512k	AS-34	1.80	1600	256K
C331	2.66	533	256k	AS-33	2.00	1600	128K
				AS-32	1.80	1600	128K
				AS-30	1.60	600	256K

Standard Features and Configurable Components

Operating System – One of the following	**Preinstalled**	Genuine Windows Vista Business 64*
		Genuine Windows Vista Business 32*
		Genuine Windows Vista Home Basic 32*
		Genuine Windows XP Professional SP2
		Genuine Windows XP Home SP2
		FreeDOS†
	Supported	Genuine Windows 2000

* Certain Windows Vista product features require advanced or additional hardware. See http://www.microsoft.com/windowsvista/getready/hardwarereqs.mspx and http://www.microsoft.com/windowsvista/getready/capable.mspx for details. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit http://www.windowsvista.com/upgradeadvisor.

† The following features are not supported by Linux:

- HP 16-in-1 Media Card Reader
- Intel PRO/1000 PT PCIe Gigabit NIC)
- Broadcom NetXtreme Gigabit PCIe NIC
- Wireless A+G PCI Card (full height and low profile)
- HP BT450 USB Bluetooth Wireless Printer and PC Adapter
- Agere 2006 PCI 56K International SoftModem
- DVI-D ADD2 SDVO single head Graphics Adapter (PCIe x16)
- ATI Radeon X1300 (256MB SH) PCIe Card, DVI w/TV
- ATI Radeon X1300 Pro (256MB DH) PCIe Graphics Card
- ATI Radeon X1600XT (256MB DH) full-height PCIe Card, DVI w/TV-out
- NVIDIA Quadro NVS 280 (64MB DH) PCI VGA Card
- NVIDIA Quadro NVS 285 (128MB DH) PCIe x16 VGA Card
- NVIDIA Quadro NVS 290 (256MB DH) PCIe x16 Graphics Card
- HP USB Smartcard Keyboard
- HP FireWire / IEEE 1394 PCI Card
- HP Serial & Parallel IO Adapter
- HP 2nd Serial Port
- Belkin USB to Serial Adapter

NOTE: Drivers for Windows Vista are continually being made available for download from http://www.hp.com.

Standard Features and Configurable Components

Value-added Software (on select models; not included with FreeDOS)

HP ProtectTools Security Solutions

Altiris Deployment Solution Agent

HP Software Agent

HP Insight Diagnostics
(available via HP Backup and Recovery Manager)

Computer Setup Utility

HP Backup and Recovery Manager

Symantec AntiVirus 10.0 with 60 day Live Update Subscription

Sonic/Roxio DigitalMedia Plus 7.2
(select models)
 or
Easy Media Creator 9 (select models)

HP Total Care Advisor

Microsoft Office 2007 Basic

Microsoft Office 2007 Personal

Microsoft Office 2007 Professional

Microsoft Office 2007 Small Business

Microsoft Works 8.5

Microsoft Internet Explorer with Google Toolbar

PDF Complete

Computrace for Desktops

Verdiem Surveyor agent

InterVideo WinDVD 5.0 (select models)

Value-added Software (available for free download from the Web http://www.hp.com/go/easydeploy)

HP Client Configuration Manager, Basic Edition

HP Client Manager for Altiris

HP SoftPaq Download Manager

HP Client Catalog for Microsoft SMS

HP Out-of-Band Management Console (for Intel AMT enabled models)

Altiris Out-of_Band Management Solution (for Intel AMT enabled models)

HP Systems Software Manager

Verdiem Surveyor agent

Value-added Services and Features

HP Stable Platform Program

Business-to-Business Portals

HP Global Series Services

Factory Express Deployment and Lifecycle Services

TPM 1.2 Security

Tool-less Serviceability

Service and Support

On-site Warranty and Service[1] : This three-year (3-3-3), limited warranty and service offering delivers three years of parts, labour and on-site repair. Response time is next business-day[2] and includes free telephone support[3] 24 x 7. Global coverage[2] ensures that any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering. Some countries/regions do not offer one year onsite and labour.

[1] Terms and conditions may vary by country. Certain restrictions and exclusions apply.

[2] On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.

[3] Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

	Ultra-slim Desktop	Small Form Factor	Convertible Minitower

QuickSpecs

Standard Features and Configurable Components

Dimensions			
Chassis Dimensions (H x W x D)	2.95 x 12.4 x 13.18 in (7.49 x 31.50 x 33.48 cm)	3.95 x 13.3 x 14.9 in (10.03 x 33.78 x 37.85 cm)	17.65 x 6.6 x 17.8 in (44.83 x 16.76 x 45.21 cm)
System weight*	12.08 lb (5.48 kg)	17.18 lb (7.79 kg)	31.18 lb (14.14 kg)
System volume	7.9 liters	12.8 liters	33.8 liters
Shipping weight*	19.20 lb (8.71 kg)	25.10 lb (11.39 kg)	39.5 lb (17.92 kg)
Maximum supported weight (desktop orientation)	77.1 lb (35 kg)	77.1 lb (35 kg)	77.1 lb (35 kg)
Shipping box dimensions (H x W x D)	12.63 x 18.75 x 20 in (32.08 x 47.63 x 50.8 cm)	12.63 x 18.75 x 20 in (32.08 x 47.63 x 50.8 cm)	23.38 x 13.06 x 22.88 in (59.39 x 33.17 x 58.12 cm)
* Configured with 1 hard drive, 1 optical drive, no diskette drive, and no PCI card.			
Power Supply	200W power supply – Active PFC	240W power supply – Active PFC	365W power supply – Active PFC
80 PLUS® Power Supply	N/A	240W 80 PLUS* power supply – Active PFC	365W 80 PLUS* power supply – Active PFC
* This alternate 80% efficient power supply is a requirement for ENERGY STAR® compliance in conjunction with a select range of processors and modules.			
Ports			
USB 2.0	8 (2 front, 6 rear)	8 (2 front, 6 rear)	8 (2 front, 6 rear)
Serial	1 optional via Serial & parallel I/O adapter	1 standard with 2nd optional	1 standard with 2nd optional
Parallel	1 optional via Serial & parallel I/O adapter	1	1
PS/2	1 keyboard, 1 mouse		
Video	analog for integrated graphics		
DVI output	available via ADD2 card, PCI-E x16 card, or PCI card		
Support for Multi-Monitor	available via ADD2 card, PCI-E x16 card, or PCI card		
Audio		Front – mic and headphone Rear – line in, line out	Front – mic and headphone Rear – line in, line out, mic in
NIC (RJ-45)	Integrated Intel 82566DM Gigabit Network Connection Ethernet		

		USDT	SFF	CMT
Chipset	Intel Q965 Express chipset	X	X	X

Standard Features and Configurable Components

		USDT	SFF	CMT
Processor and Speed* One of the following	**Intel Celeron Processors:**			
	Intel Celeron 430 Processor (1.8-GHz, 512K L2 cache, 800-MHz FSB)	X	X	X
	Intel Pentium D Processors:			
	Intel Pentium D 925 Processor (3.0-GHz, 2x2MB L2 cache, 800-MHz FSB)	X	X	X
	Intel Pentium D 945 Processor (3.4-GHz, 2x2MB L2 cache, 800-MHz FSB)	X	X	X
	Intel Core 2 Duo Processors:			
	Intel Core 2 Duo E4300 Processor (1.80-GHz, 2 MB L2 cache, 800-MHz FSB)	X	X	X
	Intel Core 2 Duo E4400 Processor (2.00-GHz, 2 MB L2 cache, 800-MHz FSB)	X	X	X
	Intel Core 2 Duo E6300 Processor (1.86-GHz, 2 MB L2 cache, 1066-MHz FSB)	X	X	X
	Intel Core 2 Duo E6400 Processor (2.13-GHz, 2 MB L2 cache, 1066-MHz FSB)	X	X	X
	Intel Core 2 Duo E6600 Processor (2.40-GHz, 4 MB L2 cache, 1066-MHz FSB)	X	X	X
	Intel Core 2 Duo E6700 Processor (2.66-GHz, 4 MB L2 cache, 1066-MHz FSB)	X	X	X

* Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.

		USDT	SFF	CMT
Intel vPro Technology*	Uses AMT 2.0 (Active Management Technology) for network alerting and management of systems regardless of power state, as well as operating system-absent environments	X	X	X

*Units configured with this feature are referred to as HP Compaq dc7700p Business PCs.

Memory	**DDR2 SYNCH DRAM NON-ECC MEMORY** Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations. The Intel Q965 Express chipsets support non-ECC DDR2 PC2-5300 (667-MHz) and PC2-6400 (800-MHz) memory.

CAUTION: You must shut down the computer **and disconnect the power cord** before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged in to an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

HP recommends dual-channel symmetric configurations for maximum performance.
For best performance, add the same amount of total memory to each channel and do not mix speeds. For dual-channel symmetric performance, the total amount of memory in each channel must be equal. If speeds are mixed, speed will default to the slowest DIMM.

Ultra-slim Desktop

Maximum Memory*	Supports up to 3 GB of DDR2 SYNCH DRAM. *Slot 1 is black and must always be populated. Not all memory configurations possible are represented below.*

Standard Features and Configurable Components

DIMM Size	Slot		
	Channel A		Channel B
	1 (black)	**2** (white)	**3** (white)
512-MB	512-MB		
512-MB (dual-channel symmetric)	256-MB		256-MB
1-GB	1-GB		
1-GB (dual channel symmetric)	512-MB		512-MB
3-GB maximum	1-GB	1-GB	1-GB

* The Intel Q965 Express chipset includes a built-in Management Engine (ME), which allocates memory for manageability functions. Management Engine memory is shared with system memory. If the PC contains a single DIMM, 8 MB of memory is pre-allocated for it at system startup. If the PC contains two DIMMs, 16 MB of memory is pre-allocated. This memory is not made available to the operating system, just as pre-allocated video memory is not available.
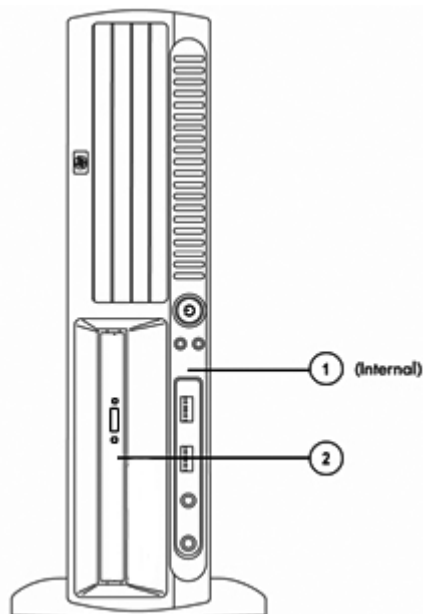
Small Form Factor and Convertible Minitower

Maximum Memory*   Supports up to 8 GB of DDR2 SYNCH DRAM. *Slot 1 is black and must always be populated. Not all memory configurations possible are represented below.*
NOTE: For systems configured with more than 3 GB of memory and a 32-bit operating system, all memory may not be available due to system resource requirements.
Addressing memory above 4 GB requires a 64-bit operating system.

DIMM Size	Slot			
	Channel A		Channel B	
	1 (black)	**2** (white)	**3** (white)	**4** (white)
512-MB	512-MB			
512-MB (dual-channel symmetric)	256-MB		256-MB	
1-GB	1-GB			
1-GB (dual-channel symmetric)	512-MB		512-MB	
1-GB (dual-channel symmetric)	256-MB	256-MB	512-MB	
2-GB (dual-channel symmetric)	1-GB		512-MB	512-MB
2-GB (dual-channel symmetric)	512-MB	512-MB	512-MB	512-MB
4-GB (dual-channel symmetric)	1-GB	1-GB	1-GB	1-GB
8-GB maximum (dual-channel symmetric)	2-GB	2-GB	2-GB	2-GB

Standard Features and Configurable Components

* The Intel Q965 Express chipset includes a built-in Management Engine (ME), which allocates memory for manageability functions. Management Engine memory is shared with system memory. If the PC contains a single DIMM, 8 MB of memory is pre-allocated for it at system startup. If the PC contains two DIMMs, 16 MB of memory is pre-allocated. This memory is not made available to the operating system, just as pre-allocated video memory is not available.

Memory Configurations – One of the following	USDT	SFF	CMT
512-MB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (1 x 512)	X	X	X
512-MB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (2 x 256)	X	X	X
1-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (1 x 1GB)	X	X	X
1-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (2 x 512)	X	X	X
2-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (2 x 1GB)	X	X	X
2-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (4 x 512)		X	X
3-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (3 x 1GB)	X	X	X
4-GB DDR2 Synch Dram PC2-6400 (800-MHz) Non ECC (4 x 1GB)		X	X
256-MB DDR2 Synch Dram PC2-5300 (667-MHz) Non ECC (1 x 256)	X	X	X
512-MB DDR2 Synch Dram PC2-5300 (667-MHz) Non ECC (1 x 512)	X	X	X
512-MB DDR2 Synch Dram PC2-5300 (667-MHz) Non ECC (2 x 256)	X	X	X
1-GB DDR2 Synch Dram PC2-5300 (667-MHz) Non ECC (1 x 1GB)	X	X	X
1-GB DDR2 Synch Dram PC2-5300 (667-MHz) Non ECC (2 x 512)	X	X	X
2-GB DDR2 Synch Dram PC2-5300 (667-MHz) Non ECC (2 x 1GB)	X	X	X
2-GB DDR2 Synch Dram PC2-5300 (667-MHz) Non ECC (4 x 512)		X	X
3-GB DDR2 Synch Dram PC2-5300 (667-MHz) Non ECC (3 x 1GB)	X	X	X
4-GB DDR2 Synch Dram PC2-5300 (667-MHz) Non ECC (4 x 1GB)		X	X

Expandability	USDT	SFF	CMT
PCI slots	Optional, requires PCI riser: 1 full-height (4.2"), length (6.6")	2 low-profile (2.5"), length (6.6") standard; 2 full-height (4.2"), length (6.875") via optional riser card. **NOTE:** With riser card option, PCIe x1 and PCIe x16 slots are not accessible.	2 full-height (4.2"), length (13.4") standard; (2 additional full-height slots available via optional PCI extender card)
Max power per slot	25W	25W	25W
PCI Express x16 slot	Optional, requires PCIe x16 riser: 1 low-profile (3.987"), length (6.60")	1 low-profile (2.5"), length (6.6")	1 full-height (4.2"), length (10.5")
Max power per slot	25W	25W	75W
PCI Express x1 slot	N/A	1 low profile (2.5"), length (6.6")	1 full-height (4.2"), length (13.4")
Max power per slot	N/A	10W	10W
External Bays	1 Slimline (WxDxH): 128 x 127 x 12.7 mm	2	4
3.5"	N/A	1	1
5.25"	N/A	1 (length 8.189")	3 (2 – length 8.189", 1 – length 5.71")

Standard Features and Configurable Components

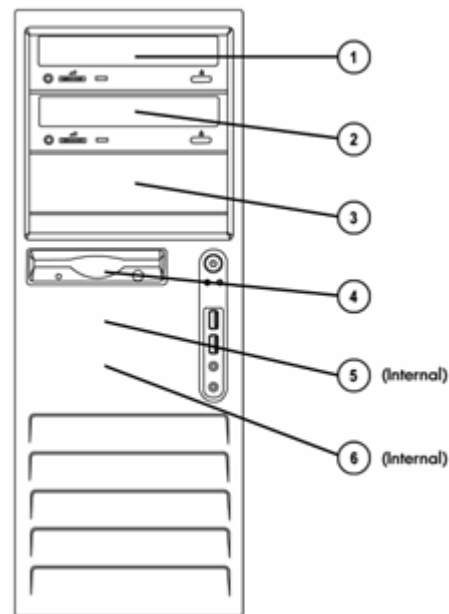| Internal 3.5" HDD Bays	1	1	2
Hard Drive Controller (PCI) Supported	Serial ATA (support for SATA 1.5-Gb/s and 3.0-Gb/s hard drives)		
Hard Drive and Optical SATA Interfaces Supported	1 Serial ATA interface	3 Serial ATA interfaces	4 Serial ATA interfaces

Ultra-slim Desktop

Small Form Factor
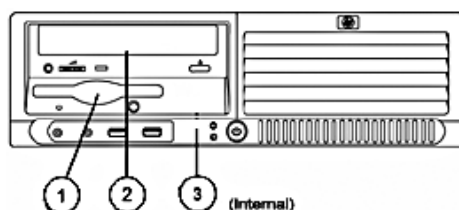
Convertible Minitower

Storage – Drive Support

	USDT		SFF			CMT			
	Slimline Drive Bay	3.5" Serial ATA Hard Drive	Diskette Drive or PCI Media Card Reader (optional)	Storage Drive Bay	3.5" Serial ATA Hard Drives	Diskette Drive	PCI Media Card Reader (optional)	Storage Drive Bays for multiple Optical Drives	3.5" Serial ATA Hard Drives
Quantity Supported	1	1	1	1	2	1	1	3	3
Position Supported	②	①	①	②	①, ③	④	④, ①, ②, ③	①, ②, ③	④, ⑤, ⑥
Controller	SATA to IDE Bridge	SATA	Diskette Controller or USB header on PCI card	SATA	SATA	Diskette Controller	USB header on PCI card	SATA	SATA

QuickSpecs

Standard Features and Configurable Components

		USDT	SFF	CMT
Hard Drive –	80-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 rpm)	X	X	X
One or two of the following	160-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 rpm)	X	X	X
	250-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 rpm)	X	X	X
	80-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 10K rpm)		X	X
	160-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 10K rpm)		X	X
	RAID 80-GB SATA 3.0-Gb/s Hard Drive (7200 rpm)		X	X
	RAID 160-GB SATA 3.0-Gb/s Hard Drive (7200 rpm)		X	X
	RAID 250-GB SATA 3.0-Gb/s Hard Drive (7200 rpm)		X	X
	2nd hard drive, 80-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 rpm)		X	X
	2nd hard drive, 160-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 rpm)		X	X
	2nd hard drive, 250-GB SATA 3.0-Gb/s Hard Drive (8MB Cache, 7200 rpm)		X	X
	Removable 3.5" 80GB SATA 3.0 Gb/s (7200 rpm) – occupies 5.25" optical bay		X	X
	Removable 3.5" 160GB SATA 3.0 Gb/s (7200 rpm) – occupies 5.25" optical bay		X	X
	Removable 3.5" 250GB SATA 3.0 Gb/s (7200 rpm) – occupies 5.25" optical bay		X	X
Removable Storage – One or more of the following depending on form factor (see Storage section below)	**Diskette Drives**			
	1.44-MB Diskette Drive		X	X
	Optical Drives			
	SATA CD-RW/DVD-ROM Combo Drive		X	X
	SATA DVD-ROM Drive		X	X
	SATA DVD+/-RW (DL/DF) LightScribe Drive		X	X
	Slimline Optical Drives			
	PATA CD-ROM Slim Drive	X		
	PATA CD-RW/DVD-ROM Combo Slim Drive	X		
	PATA DVD+/-RW Slim Drive	X		
	PATA DVD-ROM Slim Drive	X		
Media Card Reader – One of the following	HP 16-in-1 3.5" Media Card Reader w/ PCI card			X
	HP 16-in-1 5.25" Media Card Reader w/ PCI card			X

Standard Features and Configurable Components

Security				
	Integrated 1.2 TPM Embedded Security Chip	X	X	X
	Drive Lock	X	X	X
	HP ProtectTools Embedded Security Software	X	X	X
	Serial, Parallel, USB Enable/Disable (via BIOS)	X	X	X
	Removable Media Write/Boot Control	X	X	X
	Power-On Password (via BIOS)	X	X	X
	Setup Password (via BIOS)	X	X	X
	Solenoid Hood Lock / Sensor		X	X
	Hood Removal Sensor	X		

NIC				
	Intel 82566DM Gigabit Network Connection (integrated on system board)	X	X	X
	Intel PRO/1000 PT PCIe Gigabit NIC (full height bracket)			X
	Intel PRO/1000 PT PCIe Gigabit NIC (low profile bracket)		X	
	Broadcom NetXtreme Gigabit PCIe NIC (full height bracket)			X
	Broadcom NetXtreme Gigabit PCIe NIC (low profile bracket)	X*	X	
	* Requires optional PCIe riser card.			

Modem				
	Agere 2006 PCI 56K International SoftModem (full height)	X*	X*	X
	Agere 2006 PCI 56K International SoftModem (low profile)		X	
	* Requires optional PCI riser card.			

Graphics				
	Integrated Intel Graphics Media Accelerator 3000	X	X	X
	DVI-D ADD2 SDVO single head Graphics Adapter for USDT (PCIe x16)	X		
	DVI-D ADD2 SDVO single head low profile Graphics Adapter (PCIe x16)		X	
	DVI-D ADD2 SDVO single head full-height Graphics Adapter (PCIe x16)			X
	ATI Radeon X1300 (256MB SH) low profile PCIe Card, DVI w/TV	X*	X	
	ATI Radeon X1300 (256MB SH) full-height PCIe Card, DVI w/TV			X
	ATI Radeon X1300 Pro (256MB DH) low profile PCIe Graphics Card	X*	X	
	ATI Radeon X1300 Pro (256MB DH) full-height PCIe Graphics Card			X
	ATI Radeon X1600XT (256MB DH) full-height PCIe Card, DVI w/TV-out			X
	NVIDIA Quadro NVS 280 (64MB DH) PCI VGA Card	X**	X***	X***
	NVIDIA Quadro NVS 285 (128MB DH) PCIe x16 VGA Card	X*	X***	X***

* USDT requires optional PCIe riser card.
** USDT requires optional PCI riser card.
*** NVIDIA Quadro 285 and NVS 280 graphics cards can be
   combined to provide support for four monitors.

Standard Features and Configurable Components

Audio	Integrated High Definition audio with Realtek 4-channel ALC262 codec (all ports are stereo)	X	X	X
	Microphone and Headphone front ports	X	X	X
	Microphone rear port*			X
	Line-out and Line-In rear ports*	X	X	X
	Multistreaming capable*	X	X	X
	Internal Speaker	X	X	X

* Rear audio ports are re-taskable as Line-in, Line-out, or Microphone-in. External speakers must be powered externally. Multistreaming can be enabled in the Realtek control panel to allow independent audio streams to be sent to/from the front and rear jacks. This allows for different audio applications to use separate audio ports on the system. For example, the front jacks could be used with a headset for a communications application while the rear jacks are being used with external speakers and a multimedia application.

Input Devices	**Keyboard** – One of the following			
	HP PS/2 Standard Keyboard	X	X	X
	HP USB Standard Keyboard	X	X	X
	HP USB Smartcard Keyboard	X	X	X
	Mouse – One of the following			
	HP PS/2 2-Button Scroll Mouse	X	X	X
	HP PS/2 2-Button Optical Scroll Mouse	X	X	X
	HP USB 2-Button Optical Scroll Mouse	X	X	X

Miscellaneous	HP FireWire / IEEE 1394 PCI Card (full height)	X*	X*	X
	HP FireWire / IEEE 1394 PCI Card (low profile)		X	
	PCI Express riser card – adds 1 low profile PCIe x16 slot	X		
	PCI riser card – adds 1 full-height PCI slot	X		
	PCI riser card – adds 2 full-height PCI slots		X	
	NOTE: Low profile slots are unusable with riser card installed.			
	PCI extender card for CMT (adds 2 PCI slots)			X
	PCI Serial and parallel I/O adapter	X**		
	2nd serial port adapter (full height)			X
	2nd serial port adapter (low profile)		X	
	Tower stand	X	X	
	Configure dc7700 CMT in desktop orientation			X

*Requires optional PCI riser card.
**Occupies same location as PCI riser card, so both cannot be used.

QuickSpecs

After-Market Options (availability may vary by region)

		USDT	SFF	CMT	After-Market Options Part Number
Communications	**Wireless LAN**				
	HP BT450 USB Bluetooth Wireless Printer and PC Adapter	X	X	X	Q6398A#ABA
	HP Wireless A+G PCI Card (North America only)	X	X	X	EA118AA
	NICs				
	Broadcom NetXtreme Gigabit Ethernet PCI Express x1 Card	X	X	X	EA833AA
	Intel/PRO 1000 PT PCIe Gigabit NIC Card	X**	X	X	EH352AA
	Modem				
	Agere 2006 PCI 56K International SoftModem	X*	X	X	EK694AA
	Connectivity				
	HP Surge Protector, LAN & Printer Cable	X	X	X	RT174AA

* USDT requires optional PCI riser card.
** USDT requires optional PCIe riser card.

		USDT	SFF	CMT	After-Market Options Part Number
Graphics	**Single head solutions**				
	HP ADD2 SDVO PCIe DVI-D Adapter (PCIe x16)	X*	X	X	DY674A
	ADD2 SDVO PCIe VGA Adapter	X*	X	X	KH540AA
	ATI Radeon X1300 (256MB SH) PCIe Graphics Card	X*	X	X	AG392AA
	Multi head solutions				
	ATI Radeon X1300 (256MB DH) PCIe Graphics Card	X*	X	X	AH050AA
	ATI Radeon X1600 XT 256MB Dual Head PCIe x16, full height Graphics Card			X	KA647AA
	NVIDIA Quadro NVS285 (128MB DH) PCIe Graphics Card	X*	X	X	RD069AA
	NVIDIA GeForce 8400 GS 256MB Dual Head PCIe x1, low profile Graphics Card	X	X	X	GJ120AA
	NVIDIA Quadro NVS 280 Dual Head, low profile Graphics Card	X	X	X	DY599A
	HP DMS59 DVI Dual-head Connector Cable**	X**	X	X	DL139A

* USDT requires optional PCIe riser card (EU054AA).
** Requires NVIDIA Quadro NVS285 PCIe Graphics Card

		USDT	SFF	CMT	After-Market Options Part Number
Hard Drives	**Serial ATA Hard Drives**				
	HP 80-GB SATA 3.0-Gb/s Hard Drive	X	X	X	PY276AA
	HP 160-GB SATA 3.0-Gb/s Hard Drive	X	X	X	PY277AA
	HP 250-GB SATA 3.0-Gb/s Hard Drive	X	X	X	PY278AA

After-Market Options (availability may vary by region)

Input/Output Devices	Keyboards				
	HP PS/2 Standard Keyboard	X	X	X	DT527A#ABA
	HP USB Standard Keyboard	X	X	X	DT528A#ABA
	HP USB Smartcard Keyboard	X	X	X	ED707AA#ABA
	Pointing Devices				
	HP PS/2 2-Button Scroll Mouse	X	X	X	DD440B
	HP PS/2 2-Button Optical Scroll Mouse	X	X	X	EY703AA
	HP USB 2-Button Optical Scroll Mouse	X	X	X	DC172B

Memory (DIMMs)	**PC2-5300 (DDR2 667-MHz) DIMMs Non-ECC**				
	HP 2-GB PC2-5300 (DDR2 667-MHz) DIMM	X	X	X	PX977AA
	HP 1-GB PC2-5300 (DDR2 667-MHz) DIMM	X	X	X	PX976AA
	HP 512-MB PC2-5300 (DDR2 667-MHz) DIMM	X	X	X	PX975AA
	HP 256-MB PC2-5300 (DDR2 667-MHz) DIMM	X	X	X	PX974AA
	PC2-6400 (DDR2 800-MHz) DIMMs				
	HP 1-GB PC2-6400 (DDR2 800-MHz) DIMM	X	X	X	AH058AA
	HP 512-MB PC2-6400 (DDR2 800-MHz) DIMM	X	X	X	AH056AA
	HP 256-MB PC2-6400 (DDR2 800-MHz) DIMM	X	X	X	AH054AA

Monitors	**CRTs**	
	HP s7540 17" (16.0" vis) CRT Monitor	PF997AA#ABA
	TFTs	
	HP L1506 15" TFT Flat Panel Monitor – Analog only	PX848AA#ABA
	HP L1706 17" TFT Flat Panel Monitor – Analog only	PX849AA#ABA
	HP L1740 17" TFT Flat Panel Display – Analog/Digital	PL766AA#ABA
	HP L1745 17" TFT Flat Panel Display – Analog/Digital	GE178AA#ABA
	HP L1906 19" TFT Flat Panel Display – Analog only	PX850AA#ABA
	HP L1940T 19" TFT Flat Panel Display – Analog/Digital	EM869AA#ABA
	HP LP1965 19" TFT Flat Panel Display – Analog/Digital	RA373AA#ABA
	HP LP2065 20" TFT Flat Panel Display – Analog/Digital	EF227A4#ABA
	Widescreen TFTs	
	HP L2045w 20" Widescreen Flat Panel Display – Analog/Digital	RD125AA#ABA
	HP LP2465 24" TFT Widescreen Flat Panel Display – Analog/Digital	EF224A4#ABA
	HP LP3065 30" TFT Widescreen Flat Panel Display – Analog/Digital	EZ320A4#ABA
	GSA Monitors	3PO Offering
	Touchscreen TFT	
	HP L5006tm 15" Touch Screen Flat Panel Display	RB146AA#ABA
	Options	
	HP Flat Panel Speaker Bar	EE418AA

After-Market Options (availability may vary by region)

Multimedia	HP USB Powered Speakers	X	X	X	RD628AA
	Flat Panel Speaker Bar	X	X	X	EE418AA
PATA Slim Optical Drives	**DVD-ROM Drive**				
	HP PATA DVD-ROM Slim Drive	X			AH041AA
	Combo Drive				
	HP PATA CD-RW/DVD-ROM Combo Slim Drive	X			AH042AA
	DVD+/-RW Drive				
	Slim 8X DVD+/-RW (DL/DF) LightScribe PATA Slim Drive	X			AH043AA
SATA Half-Height Optical Drives	**DVD-ROM Drive**				
	HP SATA DVD-ROM Drive		X	X	AH047AA
	Combo Drive				
	HP SATA CD-RW/DVD-ROM Combo Drive		X	X	AH046AA
	DVD+/-RW Drive				
	HP SATA DVD+/-RW (DL/DF) SuperMulti LightScribe Drive		X	X	GF343AA
Removable Storage	**Diskette and Digital Drives**				
	HP 1.44-MB External USB Diskette Drive	X	X	X	DC141B
	1.44-MB Internal Floppy Drive			X	AG295AA
	1.44-MB Internal Floppy Drive		X		AG296AA
	Multimedia				
	HP 16-in-1 Media Card Reader with PCI Card		X	X	EM718AA
	Removable Hard Drive				
	HP Removable SATA Hard Drive Enclosure (Frame & Carrier)		X	X	RY102AA
	HP Removable SATA Hard Drive Enclosure (Carrier Only)		X	X	RY103AA

After-Market Options (availability may vary by region)

Security	Kensington Lock	X	X	X	PC766A
	HP Business PC Security Lock	X	X	X	TBD
	HP (USDT) Wall Mount Security Sleeve*	X			PA719A
	HP (SFF) Wall Mount Security Sleeve**		X		PA717A
	HP USB Smartcard Keyboard	X	X	X	ED707AA#ABA
	Solonoid Lock			X	DE618A
	Solonoid Lock		X		PT839AA
	HP Smart Data Protection Service	X	X	X	BB731UT

* Dimensions (W x H x L): 12.7 x 3.5 x 12.0 inches; Weight: 3.8 lb
** Dimensions (W x H x L): 13.5 x 4.4 x 14.4 inches; Weight: 5.9 lb

Software	HP Client Configuration Manager, Premium Edition	X	X	X	T3488AA (use T3489AA for 1000 licenses)
	Altiris Client Management Suite Level 1 Includes: Altiris Deployment Solution Altiris Inventory Solution Altiris Application Metering Solution Altiris Carbon Copy Solution Altiris Software Delivery Solution Altiris Application Management Solution Altiris Patch Management Solution	X	X	X	DR605A (use DR606A for 1000+ licenses)

Brackets/Stands	HP Integrated Work Centre Stand	X			DL641B
	Tower Stand		X		PS797A
	5.25" Blank Bezel Kit (Carbonite 50/Bulk Pack)		X	X	DC177B

Miscellaneous Accessories	HP Serial & Parallel IO Adapter	X			PD825A
	HP 2nd Serial Port		X	X	PA716A
	HP (USDT) PCI Riser Board	X			ED247AA
	HP (USDT) PCIe Riser Board	X			EU054AA
	HP (SFF) PCI Riser Board		X		PD824A
	HP PCI Extender			X	DC179B
	HP FireWire / IEEE 1394 PCI Card	X*	X	X	PA997A
	Belkin USB to Serial Adapter	X	X	X	EM449AA
	Cat5e Patch Cable	X	X	X	AH122AA
	Firewire (1394) Cable	X	X	X	AH123AA
	DVI to DVI cable	X	X	X	DC198A
	7-outlet Surge Protector	X	X	X	AG290AA#ABA

Technical Specifications

Unit Environment and Operating Conditions	Ultra-slim Desktop	Small Form Factor	Convertible Minitower
General Unit Operating Guidelines • Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range. • Leave a 10.2 cm (4 in) clearance on all vented sides of the computer to permit the required airflow. • Never restrict airflow into the computer by blocking any vents or air intakes. • Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air. • Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow. • If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.			
Temperature Range	Operating: 50° to 95° F (10° to 35° C)* Non-operating: -22° to 140° F(-30° to 60° C)		
Relative Humidity	Operating: 10% to 90% (non-condensing at ambient) Non-operating: 5% to 95% (non-condensing at ambient)		
Maximum Altitude (unpressurized)	Operating: 10,000 ft (3048 m) Non-operating: 30,000 ft (9144 m)		
* Operating temperature is de-rated 1.0 deg C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.			

Power Supply	Ultra-slim Desktop	Small Form Factor	Convertible Minitower
Power Supply	200 watt custom power supply – Active PFC)	240 watt custom power supply – Active PFC	365 watt custom power supply – Active PFC)
Operating Voltage Range	90 – 264 VAC	90 – 264 VAC	90 – 264 VAC
Rated Voltage Range	100 – 240 VAC	100 – 240 VAC	100 – 240 VAC
Rated Line Frequency	50/60 Hz	50/60 Hz	50/60 Hz
Operating Line Frequency Range	47 – 63 Hz	47 – 63 Hz	47 – 63 Hz
Rated Input Current	4A	4A	6A
Rated Input Current 80Plus*	N/A	3.5A	5A
System Heat Dissipation	Typical 300 btu/hr (76 kg-cal/hr) Maximum 1050 btu/hr (265 kg-cal/hr)	Typical 307 btu/hr (77 kg-cal/hr) Maximum 1260 btu/hr (318 kg-cal/hr)	Typical 307 btu/hr (77 kg-cal/hr) Maximum 1916 btu/hr (483 kg-cal/hr)
System Heat Dissipation 80Plus* Power Supply	N/A	Typical 239 btu/hr (60 kg-cal/hr) Maximum 1024 btu/hr (258 kg-cal/hr	Typical 239 btu/hr (60 kg-cal/hr) Maximum 1557 btu/hr (392 kg-cal/hr)
Power Supply Fan	70mm variable speed	80mm variable speed	92mm variable speed
Energy Star 3.0 Compliant Standard Power Supply	X	X	X
Energy Star 4.0 Compliant 80Plus* Power Supply	X	X	X

Technical Specifications

FEMP Standby Power Compliant (<2W in S5 – Power Off)**	X	X	X
Power Consumption in ES Mode – Suspend to RAM (S3) (Instantly Available PC)	< 3W	< 3W	< 3W
Environmental and Mechanical Engineering Support Centre (EMESC) – Intranet Web Site only	http://env-webserver.ccm.cpqcorp.net/EMESC/default.htm		

* This 80% efficient power supply is a requirement for US Energy Star 4.0 compliance in conjunction with a select range of processors and modules.
** Power consumption in the Off/Apparent Off mode is measured and reported with the network interface controller "Wake on LAN" feature disabled in F10 Setup (default is "enabled").

ROM BIOS Information

Key features of the HP BIOS in the dc7700 include:

- Deployment and manageability – HP BIOS provides several technologies that help integrate the HP Business desktop computer into the enterprise, such as PXE, remote configuration, remote control, and F10 Setup support for 12 languages. Select models offer Intel vPro technology including AMT (Active Management Technology).
- Stability – HP BIOS supports the HP stable product roadmap by releasing only critical BIOS changes to the factory and advanced change notification.
- Security – HP BIOS Configuration for ProtectTools offers a robust and flexible set of security features to help the system administrator secure their systems from removal of sensitive data, and help prevent access by unauthorized users.
- Thermal and power management – The HP BIOS provides and enables thermal and power management technologies to assist in operating the HP Business Desktop computer in any enterprise environment.
- Serviceability – HP BIOS provides diagnostic and detailed service information.
- Upgrades and recovery – HP BIOS provides numerous ways to upgrade HP Business Desktop computers, including BIOS updates from within DOS (Flashlite), BIOS updates from within Windows (HPQFlash, SSM), HP Client Manager, and fail-safe recovery. In addition, the HP Business Desktop BIOS Utilities tool enables replicated BIOS setup throughout the Enterprise; it is available from within the BIOS software and from the support website.

Additional HP BIOS Features

- Power-On password – Helps prevent an unauthorized user from powering on the system. After a TPM Basic User password is established in windows, the user or admin can require TPM hardware based authentication during the power-on process.
- Administrator password – Also known as the setup password, this helps prevent unauthorized changes to the system configuration. If the administrator password is not known, the BIOS version cannot be changed and changes cannot be made to BIOS settings using F10 setup or under the OS.
- Advanced Configuration and Power Interface (ACPI) – Represents a significant innovation in power and configuration management, allowing operating systems and applications to manage power based on activity and usage. HP Compaq dc7700 models use ACPI to provide power conservation features under Windows XP.

Technical Specifications

Other Features	Description
ACPI-Ready Hardware	Advanced Configuration and Power Management Interface (ACPI). ● Allows the system to wake from a low power mode. ● Controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system.
SMBIOS Ver. 2.5	System Management BIOS, for system management information
Wired for Management Support	Intel-driven, industry-wide initiative to make Intel architecture-based PCs, servers and mobile computers more inherently manageable right out of the box and over the network
Dual-State Power Button	Power button acts as both an on/off button and suspend-to-sleep button

Serviceability Features of System		
Dual Colour Power LED on Front of Computer (Indicates Normal Operations and Fault Conditions)		
Diagnostic LED Explanation Table	Number of 1-second red LED blinks followed by 2-second pause, then repeats: 2-processor thermal protection activated 3-processor not installed 4-power supply failure 5-memory error 6-video error 7-PCA failure (ROM detected failure prior to video) 8-invalid ROM, bootblock recover mode	
● System/Emergency ROM	● Flash ROM	● CMOS Battery Holder for easy Replacement
● Flash Recovery with Video Configuration Record SW	● 5 Aux Power LED on System PCA	● Processor ZIF Socket for easy Upgrade
● Over-Temp Warning on Screen (Requires IM Agents)	● Clear Password Jumper	● DIMM Connectors for easy Upgrade
● HP Backup and Recovery Manager	● Clear CMOS Button	● NIC LEDs (integrated) (Green & Amber)

Serviceability Features of Chassis		
● Dual Colour Power and HD LED – To Indicate Normal Operations and Fault Conditions	● Colour coordinated cables and connectors	● Tool-less Hood Removal
● Front power switch	● System memory can be upgraded without removing the system board or any internal components	● Tool-less Hard Drive, CD & Diskette Removal
● Green Pull Tabs, and Quick Release Latches for easy Identification		● Tool-less System Board Removal

NOTE: Thumb screw release mechanism is used with the Ultra-slim Desktop chassis cover.

Feature	Description
AMT 2.0 support (Active Management Technology)	Select models offer new Intel vPro Technology utilizing AMT 2.0 for network alerting and management of systems regardless of power state, as well as operating system-absent environments.

QuickSpecs

Technical Specifications

ASF 2.0 support (Alert Standard Format)	Industry-standard specification for network alerting in operating system-absent environments
Tower	Product can be oriented as a tower (in addition to desktop orientation)
Drive Lock*	Implementation of the industry standard ATA Security feature set. When enabled, it prevents software access to user data on the drive until one or two user-defined passwords are provided.
Drive Self Tests (DPS)* DPS Access through F10 Setup during Boot	- Drive Protection System - A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user. - Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the computer's setup procedure. It produces an evaluation on whether the hard drive is the source of the problem and needs to be replaced. - The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures.
SMART Technology* (Self-Monitoring, Analysis and Reporting Technology) SMART I – Drive Failure Prediction SMART II – Off-Line Data Collection SMART III – Off-Line Read Scanning with Defect Reallocation	Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted - Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count - By avoiding actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure
* **NOTE:** This feature is inoperable when a RAID (Redundant Array of Independent Disks) configuration is enabled.	

Technical Specifications - Audio

High Definition Audio	**Type**	Integrated
	High Definition Stereo Codec	Yes – Realtek ALC262, 4-channel
	Audio Jacks	Microphone-In (64-K ohm Input Impedance); front and rear stereo analog microphone ports available except for USDT and SFF, which has front stereo microphone only
		Line-In (64-K ohm Input Impedance)
		Line-Out * (200 ohms Output Impedance, expects at least a 10-K ohm load)
		Headphone-Out (1 Ohm Output Impedance, expects at least a 32 ohm load)
	* Internal Speaker Amplifier is for Internal Speaker only. External Speakers need to be powered externally. Rear audio ports are re-taskable as Line-in, Line-out, or Microphone-in.	
	Multistreaming Capable	Multistreaming can be enabled in the Realtek control panel to allow independent audio streams to be sent to/from the front and rear jacks.
	Sampling	8 kHz – 192 kHz
	Wavetable Syntheses (software)	Yes – Uses OS soft wavetable
	Analog Audio	Yes
	Number of Channels on Line-Out (mono/stereo)	Stereo (Left & Right channels)
	Internal Audio Speaker Power Rating	1.5 W
	Internal Speaker	Yes
	External Speaker Jack (Line-Out)	Yes

Technical Specifications - Communications

Integrated Intel 82566DM Gigabit Network Connection		
Connector	RJ-45	
Controller	Intel Nineveh Gigabit platform LAN Connect Networking Controller	
Memory	Integrated 96KbB on chip buffer memory	
Data rates supported	10/100/1000 Mbps	
Compliance	IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3 ab and 802.3u compliant,	
Bus architecture	GLCI, LCI interface. Intel specific MAC to PHY interface	
Data transfer mode	At gigabit GLCI (802.3 serdes) is for Data, LCI (parallel bus)for MDIO, at 10/100 LCI for both data and MDIO, GLCI is idle.	
Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union	
Power requirement	Require 3.3Vaux,1.8V and 1.0V or just 3.3V with integrated regulators Power consumption 1.16 Watts for 82566, whole LOM 2.53 Watts	
ACBS	Intel Auto Connect Battery Saving feature	
Boot ROM support	Yes	
Network transfer mode	Full-duplex	
	Half-duplex (not available for the 1000BASE-T transceiver)	
Network transfer rate	10BASE-T (half-duplex) 10 Mbps	
	10BASE-T (full-duplex) 20 Mbps	
	100BASE-TX (half-duplex) 100 Mbps	
	100BASE-TX (full-duplex) 200 Mbps	
	1000BASE-T (full-duplex) 2000 Mbps	
Environmental	**Operating temperature**	32° to 131°F (0° to 55° C) To 70° C for external regulator
	Operating humidity	85% at 131° F (55° C)
Management capabilities	WOL, auto MDI crossover, PXE, Muti-port teaming, RSS, Advanced cable diagnostic.	
Alerting	ASF 2.0 support, AMT 2.0 support on dc7700p models with Intel vPro Technology	

Technical Specifications - Communications

Intel PRO/1000 PT PCIe Gigabit NIC		
Connector	RJ-45	
Controller	Intel 82572EI Gigabit Ethernet Controller	
Memory	Integrated Dual 48K configurable transmit receive FIFO Buffers	
Data rates supported	10/100/1000 Mbps	
Compliance	IEEE 802.1P, 802,1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control	
Bus architecture	PCI-E 1.0a	
Data transfer mode	Bus-master DMA	
Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union	
Power requirement	Aux 3.3V, 3.0 Watts in 1000base-T and 2.0 Watts in 100Base-T	
Boot ROM support	Yes	
Network transfer rate	10BASE-T (half-duplex) 10 Mbps	
	10BASE-T (full-duplex) 20 Mbps	
	100BASE-TX (half-duplex) 100 Mbps	
	100BASE-TX (full-duplex) 200 Mbps	
	1000BASE-T (full-duplex) 2000 Mbps (actual rate limited by PCI Bus)	
Environmental	**Operating temperature**	32° to 131°F (0° to 55° C)
	Operating humidity	85% at 131° F (55° C)
Dimensions	6.4 x 2.6 x 0.8 in (16.3 x 6.6 x 1.9 cm)	
Management capabilities	ASF, WOL, PXE, DMI, WFM 2.0.	

Agere 2006 PCI 56K International SoftModem	
Data Transmission	Technology speeds: 56,000 Kbps maximum downstream data, controllerless
NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions.	
Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/ 9,600/7,200/4,800/2,400/1,200/300
Data Standards	ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103
Fax Speeds	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
Fax Mode Capabilities	ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2
Error Correction and Data Compression	V.44, 42bis, V.42 and MNP2-5
Power Management	ACPI; PPMI 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements
Upgradeability	Driver upgradeable for future enhancements
Video	ITU-T V.80 video ready interface

Technical Specifications - Communications

Other	TIA/EIA 602 standard AT command set
	Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface
	Optional ring wakeup signal
Operating Temperature	32° to 158° F (0° to 70° C)
Operating Humidity	20% to 90%, non-condensing
Power	Requires a 3.3-V auxiliary power rail on PCI bus
	Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load
Chipset	Agere Systems SV92PL – Integrated PCI interface with 5-V tolerant buffers and CardBus support
Dimensions (L X H)	Complies with PCI low profile specifications-6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
Connection	Single RJ-11 connector
Other Features	Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support
Safety	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark
EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals Not available in Korea or the Republic of South Africa.
Health	Bare PCB material compliant to 94V-0 or better (marked as such)
Other	PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant

Technical Specifications - Graphics

Integrated Graphics Media Accelerator 3000	**3D/2D Controller**	Microsoft DirectX® 9 based with support for Pixel Shader 2.0, 4:1 anisotropic filtering, Gaussian texture filtering, shadow maps, volumetric textures, double-sided stencil buffers, and 4 pixel pipes.
	VGA Controller	Integrated
	Bus Type	PCI Express™ x16 (If an external graphics card is installed in a PCI slot, the internal graphics can be enabled or disabled using the system's BIOS setup utility. If an external graphics card is installed in the PCI Express™ slot, the internal graphics cannot be enabled).
	RAMDAC	Integrated, 400 MHz
	Memory	Graphics memory is shared with system memory. Graphics memory usage varies depending on the amount of system memory installed and system load. 8 MB is pre-allocated for graphics use at system boot time. Additional memory is allocated for graphics as needed using Intel's Dynamic Video Memory Technology (DVMT), to provide an optimal balance between graphics and system memory use. **System memory equal or greater than 512 MB** 8 MB pre-allocated + 248 MB DVMT = max frame buffer of 256 MB
	Controller Clock Speed	400 MHz
	Overlay Planes	Single overlay support with 5x3 filtering
	Maximum Colour Depth	32 bits/pixel
	Maximum Vertical Refresh Rate	85 Hz at up to 1920x1440, 85 Hz at 2048x1536. Varies with mode and configuration. See table below.
	Multi-display Support	Support for one CRT via the motherboard's VGA connector. Support for an additional DVI-D display via the optional DVI ADD2 card. Dual independent displays and dual synchronous (Twin or Clone mode) displays are supported.
	Graphics/Video API Support	Microsoft DirectX®9, DirectXVA®, VMR9, GDI/GDI+; OpenGL® 1.4.

Resolutions Supported[1]	**Resolution**	**Maximum Refresh Rate** (Hz)	
		Analog Monitor	**Digital Monitor**
	640 x 480	85	60
	800 x 600	85	60
	1024 x 768	85	60
	1280 x 1024	85	60
	1600 x 1200	85	60
	1920 x 1080	85	60
	1920 x 1200	85	60
	1920 x 1440	85	60
	2048 x 1536	85	60

1 Modes listed are supported with a single active display. The supported mode list for multiple active displays is a subset of this list. Not all modes will support video playback and some supported modes may use software MC (motion compensation) rather than hardware MC. Not all modes will support 3D acceleration depending on the system configuration (e.g., resolution selected, size of frame buffer, number of installed memory modules, etc.).

NOTE: Other resolutions and refresh rates may be selectable but are not recommended.

Technical Specifications - Graphics

DVI ADD2 Graphics	**Models**	DY674A Intel DVI ADD2 adapter
	Form Factor	Low-profile card
	DVI-D Connector	Compliant with DDWG (Digital Display Working Group) and VESA specifications for a single-link digital DVI (DVI-D) connector.
	Dual Head Support	Yes, when used with the integrated VGA connector
	Display Devices Supported	HP L1530 HP L1740 HP L1755 HP L1940 HP L1955 HP L2035 HP L2335

NOTE: The DVI ADD2 card offers optimal performance with any display that meets applicable VESA standards.

Colour Depth	All modes support 8-bpp, 16-bpp, and 24-bpp colour depths
Host Interface Connector	Mechanically compliant with PCI-E standard Complies with the Intel ADD2 and Intel Serial Digital Video Output (SDVO) specifications
Dot Clock	165 MHz maximum
Display Modes	Supports display modes that require up to 165-MHz bandwidth on the link, as shown in the following table.

Resolution		60-Hz LCD	60-Hz	75-Hz	85-Hz
Blanking		5% reduced	GTF	GTF	GTF
640 x 480	VGA	Yes	Yes	Yes	Yes
800 x 600	SVGA	Yes	Yes	Yes	Yes
1024 x 768	XGA	Yes	Yes	Yes	Yes
1280 x 1024	SXGA	Yes	Yes	No	No
1600 x 1200	UXGA	Yes	Yes	No	No

Technical Specifications - Graphics

ATI Radeon X1300 (256MB SH) PCIe Graphics Card	**Bus Type**	PCI Express (x16 lanes)
	Maximum Vertical Refresh Rate	85 Hz
	Display Support	Integrated 400 MHz RAMDAC
	Display Max Resolution	2048 x 1536
	Board Display Options	DVI-I + TV DVI-I supports analog CRT or flat panel or digital flat panel (using DVI-A, DVI-D or DVI-I connector) DVI-I supports analog CRT or flat panel (with VGA connector and DVI-I to VGA dongle) TV connector is a 4-pin mini-DIN S-video connector

Board Configuration 128 MB Frame Buffer	Specification	Description
	Graphics Chip	RV515
	Core clock	450 MHz
	Memory clock	250 MHz
	Frame buffer	256 MB DDR2

Languages supported	24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish	
Core Power	25 W (Max board power)	

Option kit contents

- ATI RADEON X1300 PCIe graphics card with full height bracket attached
- Low profile bracket
- DVI-to-VGA Adapter
- Software CD with graphics drivers
- Warranty documentation

Compliance standards

EMC Emissions:
a) FCC Part 15, Subpart B – Unintentional Radiators, Class B Computing Devices for Home & Office Use
b) CISPR22: 1997/EN 55022:1998 – Class B – Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment
c) Canadian Standard ICES-003 is equivalent to CISPR22
d) Taiwanese Standard BSMI
e) Japanese VCCI
f) Australian C-Tick

EMC Immunity:
CISPR 24:1997/EN 55024:1998 – Information Technology Equipment - Immunity Characteristics – Limits and Methods of Measurement.

Safety:
UL 60950 (USA) & EN 60950 (EU): Safety of Information Technology Equipment, Including Electrical Business Equipment. All boards meet UL PCB flammability requirements.

Technical Specifications - Graphics

ATI RADEON X1600XT (256 MB DH) FH PCIe Graphics Card		
Bus Type	PCI Express (x16 lanes)	
Maximum Vertical Refresh Rate	85 Hz	
Display Support	Integrated 400 MHz RAMDAC	
Display Max Resolution	2560 x 1600 digital, 2048 x 1536 analog	
Board Display Options	2 DVI-I ports (one port supports dual link DVI). DVI-I supports an analog CRT or flat panel with a VGA connector via the provided DVI-I to VGA adapter	
	4-pin mini-DIN S-video connector for TV output	
Board Configuration	**Specification**	**Description**
	Graphics chip	RV530
	Core clock	590 MHz
	Memory clock	690 MHz
	Frame buffer	256 MB GDDR3, 128 bit wide
Core Power	56 W (Max board power)	

NVIDIA Quadro NVS 280 64MB PCI Dual Head	
Form Factor	Low profile (both ATX and low profile brackets included)
Graphic Controller	Integrated Quadro 280 2-D graphics processor unit (GPU)
Bus type	PCI
RAMDAC	Dual 350 MHz integrated
Memory	64 MB DDR with frame buffer and Texture storage
Connector	Single High-density DMS-59 Connector
Dimensions	Low-profile, 2.586 x 6.6 in (6.57 x 16.76 cm)
Controller clock speed	250 MHz
Colour depth	32-bits/pixel max
Overlay planes	One 16-bit Video overlay plane
Maximum vertical refresh rate	85 Hz
Multi-monitor support	Dual analog or digital monitors
Dual DVI Support	Yes (with kit DL139A)
High-definition Video Processor (HDVP)	Full-screen, full-frame video playback of HDTV and DVD content DVD-ready motion compensation for MPEG-2 Independent hardware colour controls for video overlay Hardware colour-space conversion (YUV 4:2:2 and 4:2:0) IDCT motion compensation
Available graphics drivers	Microsoft Windows 2000 and Microsoft Windows XP (Provides full native Dual View mode, Span or Big Desktop mode, and Clone mode)

NOTE: HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/eng/software_drivers.html.

QuickSpecs

Technical Specifications - Graphics

Analog Resolution	Maximum Refresh Rate
640 x 480	240 Hz
800 x 600	240 Hz
1024 x 768	200 Hz
1600 x 1200	170 Hz
1600 x 1200	150 Hz
1600 x 1200	100 Hz
1920 x 1200	85 Hz
1920 x 1200	85 Hz
1920 x 1440	75 Hz
2048 x 1536	60 Hz

Digital Resolution	Maximum Refresh Rate
640 x 480	75 Hz
800 x 600	75 Hz
1024 x 768	75 Hz
1152 x 864	60 Hz
1280 x 1024	60 Hz
1600 x 1200	60 Hz (primary only)

Technical Specifications - Hard Drives

7200 rpm Serial ATA Hard Drives	250-GB	Capacity	250,059,350,016 bytes		
		Height	1 in (2.54 cm)		
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)		
		Interface	Serial ATA (3.0 Gb/s)		
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s		
		Buffer	8 MB		
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	1.0 ms	
			Average	8.5 ms	
			Full-Stroke	18 ms	
		Rotational Speed	7,200 rpm		
		Logical Blocks	488,397,168		
		Operating Temperature	41° to 131° F (5° to 55° C)		
	160-GB	**Capacity**	163,928,604,672 bytes		
		Height	1 in (2.54 cm)		
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)		
		Interface	Serial ATA (3.0 Gb/s)		
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s		
		Buffer	8 MB		
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.9 ms	
			Average	9.3 ms	
			Full-Stroke	18 ms	
		Rotational Speed	7,200 rpm		
		Logical Blocks	320,173,056		
		Operating Temperature	41° to 131° F (5° to 55° C)		

Technical Specifications - Hard Drives

	80-GB	**Capacity**	80,026,361,856 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.5 in (8.89 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (3.0 Gb/s)	
		Synchronous Transfer Rate (Maximum)	Up to 3 Gb/s	
		Buffer	8 MB	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	2.0 ms
			Average	9.3 ms
			Full-Stroke	21 ms
		Rotational Speed	7,200 rpm	
		Logical Blocks	156,301,488	
		Operating Temperature	41° to 131° F (5° to 55° C)	

10,000 RPM Serial ATA Hard Drives	**160-GB**	**Capacity**	160,041,885,696 bytes	
		Height	1 in (2.54 cm)	
		Width	Media diameter: 3.0 in (7.62 cm) Physical size: 4 in (10.2 cm)	
		Interface	Serial ATA (1.5 Gb/s), Native Command Queuing enabled	
		Synchronous Transfer Rate (Maximum)	Up to 1.5 Gb/s	
		Cache	16 Mbytes	
		Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.3 ms
			Average	4.6 ms
			Full-Stroke	10.2 ms
		Rotational Speed	10,000 RPM	
		Logical Blocks	312,581,808	
		Operating Temperature	41° to 131° F (5° to 55° C)	

Technical Specifications - Hard Drives

80-GB	**Capacity**	80,026,361,856 bytes		
	Height	1 in (2.54 cm)		
	Width	Media diameter: 3.0 in (7.62 cm) Physical size: 4 in (10.2 cm)		
	Interface	Serial ATA (1.5 Gb/s), Native Command Queuing enabled		
	Synchronous Transfer Rate (Maximum)	Up to 1.5 Gb/s		
	Cache	16 Mbytes		
	Seek Time (typical reads, includes controller overhead, including settling)	**Single Track**	0.3 ms	
		Average	4.6 ms	
		Full-Stroke	10.2 ms	
	Rotational Speed	10,000 RPM		
	Logical Blocks	156,301,488		
	Operating Temperature	41° to 131° F (5° to 55° C)		

QuickSpecs

Technical Specifications - Input/Output Devices

USB Standard Keyboard	**Physical characteristics**	**Keys**	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	**Operating voltage**	+ 5VDC ± 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		System interface	USB Type A plug connector
		ESD	CE level 4, 15-kV air discharge
		EMI – RFI	Conforms to FCC rules for a Class B computing device
		Microsoft® PC 99 – 2001	Functionally compliant
	Mechanical	**Languages**	38 available
		Keycaps	Low-profile design
		Switch actuation	55-g nominal peak force with tactile feedback
		Switch life	20 million keystrokes (using Hasco modified tester)
		Switch type	Contamination-resistant switch membrane
		Key-leveling mechanisms	For all double-wide and greater-length keys
		Cable length	6 ft (1.8 m)
		Microsoft PC 99 – 2001	Mechanically compliant
		Acoustics	43-dBA maximum sound pressure level
	Environmental	**Operating temperature**	50° to 122° F (10° to 50° C)
		Non-operating temperature	-22° to 140° F (-30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
	Approvals		UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC
	Ergonomic compliance		ANSI HFS 100, ISO 9241-4, and TUVGS
	Kit contents		Keyboard, installation guide, warranty card, safety and comfort guide

QuickSpecs

Technical Specifications - Input/Output Devices

PS/2 Standard Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
		Dimensions (L x W x H)	18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm)
		Weight	2 lb (0.9 kg) minimum
	Electrical	**Operating voltage**	+ 5VDC ± 5%
		Power consumption	50-mA maximum (with three LEDs ON)
		System interface	PS/2 6-pin mini din connector
		ESD	CE level 4, 15-kV air discharge
		EMI – RFI	Conforms to FCC rules for a Class B computing device
		Microsoft PC 99 – 2001	Functionally compliant
	Mechanical	**Languages**	38 available
		Keycaps	Low-profile design
		Switch actuation	55-g nominal peak force with tactile feedback
		Switch life	20 million keystrokes (using Hasco modified tester)
		Switch type	Contamination-resistant switch membrane
		Key-leveling mechanisms	For all double-wide and greater-length keys
		Cable length	6 ft (1.8 m)
		Microsoft PC 99 – 2001	Mechanically compliant
		Acoustics	43-dBA maximum sound pressure level
	Environmental	**Operating temperature**	50° to 122° F (10° to 50° C)
		Non-operating temperature	-22° to 140° F (-30° to 60° C)
		Operating humidity	10% to 90% (non-condensing at ambient)
		Non-operating humidity	20% to 80% (non-condensing at ambient)
		Operating shock	40 g, six surfaces
		Non-operating shock	80 g, six surfaces
		Operating vibration	2-g peak acceleration
		Non-operating vibration	4-g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
		Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
	Approvals		UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC
	Ergonomic compliance		ANSI HFS 100, ISO 9241-4, and TUVGS
	Kit contents		Keyboard, keyboard software media, installation guide, warranty card, safety and comfort guide

HP USB Smartcard Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country)
		Form factor	USB basic Smart Card keyboard

Technical Specifications - Input/Output Devices

	Colours	Carbonite/Silver
	Dimensions (H x W x D)	18.2 x 6.3 x 1.3 in (46.3 x 16.1 x 3.3 cm)
	Weight	2 lb (0.9 kg) minimum
Electrical	**Operating voltage**	+ 5VDC ± 5%
	Power consumption	100-mA maximum (with four LEDs ON)
	System interface	USB Type A plug connector
	ESD	CE level 4, 15-kV air discharge
	EMI – RFI	Conforms to FCC rules for a Class B computing device
	Microsoft PC 99 – 2001	Functionally compliant
Mechanical	**Languages**	30+ available
	Keycaps	Low-profile design
	Switch actuation	55 g nominal peak force with tactile feedback
	Switch life	20 million keystrokes (using Hasco modified tester)
	Switch type	Contamination-resistant membrane
	Key-leveling mechanisms	For all double-wide and greater-length keys
	Cable length	6 ft (1.8 m)
	Microsoft PC 99 - 2001	Mechanically compliant
	Acoustics	43-dBA maximum sound pressure level
Environmental	**Operating temperature**	50° to 122° F (10° to 50° C)
	Non-operating temperature	-22° to 140° F (-30° to 60° C)
	Operating humidity	10% to 90% (non-condensing at ambient)
	Non-operating humidity	20% to 80% (non-condensing at ambient)
	Operating shock	40 g, six surfaces
	Non-operating shock	80 g, six surfaces
	Operating vibration	2-g peak acceleration
	Non-operating vibration	4-g peak acceleration
	Drop (out of box)	26 in (66 cm) on carpet, six-drop sequence
	Drop (in box)	42 in (107 cm) on concrete, 16-drop sequence
SMARTCARD function	**Support**	All ISO 7816 smart cards
	Interface	Reads from and writes to all ISO7816-1, 2, 3, 4 memory and microprocessor smart cards (T=0, T=1)
	Chipset	SCM STCII
	Standard APIs supported	PC/SC, EMV2000, SET

Technical Specifications - Input/Output Devices

Power	USB Port Short circuit detection (protects smart card and reader) Power supply compliant with ISO7816 and EMV (5V, 60 mA) Supports 3-V and 5-V cards	
Power consumption	250-mA maximum draw (50 mA for the keyboard with three LEDs ON and 200-mA maximum startup current using a high-current, 60-mA smart card)	
Communication	**From card**	Programmable from 9,600 baud to 115,200 baud
	From computer	Up to 38,400 baud
Landing mechanism	**Contact device**	Friction contact
	Card insertions rating	Up to 100,000 insertion cycles
Interface modes	USB communications through USB port SCM protocol Automatic card insertion/removal detection	
Reader performance interface	USB connection	
Electro-magnetic standards	**Europe**	89/336/CEE guideline
	USA	USAFCC part 15

HP PS/2 Scroll Mouse	**Dimensions**	3.8 x 6.3 x 11.6 cm (1.5 x 2.5 x 4.6 in)
	Weight	4.44 oz (126 g)
	Environmental	**Operating temperature**	50° to 122° F (10° to 50° C)
		Non-operating temperature	22° to 140° F (-30° to 60° C)
		Operating humidity	10% to 90% (non condensing at ambient)
		Non-operating humidity	20% to 80% (non condensing at ambient)
		Operating shock	40 g, 6 surfaces
		Non-operating shock	80 g, 6 surfaces
		Operating vibration	2 g peak acceleration
		Non-operating vibration	4 g peak acceleration
		Drop (out of box)	26 in (66 cm) on carpet, 6-drop sequence
		Drop (out of box)	1 m on asphalt tile over concrete, 6-drop sequence
	Electrical	**Operating voltage**	5 VDC ± 10%
		Power consumption	15 mA
		System consumption	PS/2 mini-din connector

Technical Specifications - Input/Output Devices

		ESD	CE level 4, 15 kV air discharge
		EMI-RFI	Conforms to FCC rules for a Class B computing device
		Microsoft PC99 – 2001	Functionally compliant
	Mechanical	**Resolution**	400 ± 20% DPI
		Tracking speed	10 in/s (25.4 cm/s) maximum
		Acceleration	100 in/s/s (2.54 m/s/s)
		Switch actuation	65 g nominal peak force
		Switch life	1,000,000 operations (using Hasco modified tester)
		Switch type	Low force micro-switches
		Tracking mechanism life	155 mi (250 km) at average speed of 10 in/s
		Cable length	6 ft (1.8 m)
		Microsoft PC99 – 2001	Mechanically compliant
	Scroll wheel	**Width**	8 mm
		Diameter	0.99 in (25.2 mm)
		Maximum rotation speed	30 mm/s
		Switch type	Light force micro-switch
		Switch life	1 million operations
		Mechanical life	Minimum 200,000 revolutions
	Regulatory approvals	**Compliant**	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC

HP PS/2 Optical Scroll Mouse	**Dimensions** (H x L x W)		3.95 x 6.21 x 11.7 cm (1.56 x 2.44 x 4.61 in)
	Weight		4.44 oz (126 g)
	Environmental	**Operating temperature**	-32° to 104°F (0° to 40° C)
		Non-operating temperature	-4° to 140°F (-20° to 60° C)
		Operating humidity	10% to 90% (non condensing at ambient)
		Non-operating humidity	10% to 90% non condensing
		Operating shock	40 g, 6 surfaces
		Non-operating shock	80 g, 6 surfaces
		Operating vibration	2 g peak acceleration
		Non-operating vibration	4 g peak acceleration
		Drop (out of box)	80 cm height onto asphalt tile over concrete or equivalent, 5-drop in 5 direction except the cable face
	Electrical	**Operating voltage**	5 VDC ± 10%
		Power consumption	100mA

Technical Specifications - Input/Output Devices

	System consumption	PS/2 mini-din connector
	ESD	CE level 4, 15 kV air discharge
	EMI-RFI	Conforms to FCC rules for a Class B computing device
	Microsoft PC99 – 2001	Functionally compliant
Mechanical	**Resolution**	400 ± 20% DPI
	Tracking speed	10 in/s (25.4 cm/s) maximum
	Acceleration	100 in/s/s (2.54 m/s/s)
	Switch actuation	61 g nominal peak force
	Switch life	3,000,000 operations (using Hasco modified tester)
	Switch type	Low force micro-switches
	Tracking mechanism life	155 mi (250 km) at average speed of 10 in/s
	Cable length	6 ft (1.8 m)
	Microsoft PC99 – 2001	Mechanically compliant
Scroll wheel	**Width**	8 mm
	Diameter	1.01 in (25.6 mm)
	Maximum rotation speed	48 rats/sec
	Switch type	Light force micro-switch
	Switch life	1 million operations
	Mechanical life	Minimum 200,000 revolutions
Regulatory approvals	**Compliant**	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC

HP USB Optical Scroll Mouse	**Dimensions** (H x L x W)	1.5 x 4.5 x 2.5 in (3.8 x 11.6 x 6.3 cm)
	Weight	0.27 lb (0.12 kg)
	Cable length	72.8 in (185 cm)
	System requirements	Microsoft Windows 95, 98, 2000, Me, and XP Available USB port

Technical Specifications - Optical Storage

SATA DVD+/-RW (DL/DF) LightScribe Drive	**Height**	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Disc capacity	8.5 GB DL or 4.7 GB standard	
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (max)	2.6 lb (1.2 kg)	
	Write speeds	**DVD+R**	Up to 16X
		DVD+RW	Up to 8X
		DVD+R DL	Up to 8X
		DVD-R DL	Up to 4X
		DVD-R	Up to 16X
		DVD-RW	Up to 6X
		CD-R	Up to 48X
		CD-RW	Up to 32X
	Read speeds	**DVD-RAM**	Up to 4X
		DVD+RW, DVD-RW, DVD+R DL, DVD-R DL	Up to 8X
		DVD-ROM, DVD+R, DVD-R	Up to 16X
		CD-ROM, CD-R	Up to 48X
		CD-RW	Up to 32X
	Access time (typical reads, including settling)	**Random**	DVD: < 130 ms (typical), CD: < 120 ms (typical)
		Full Stroke	DVD: < 240 ms (seek), CD: < 200 ms (seek)
	Power	**Source**	SATA DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p
			12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC (< 1000 mA typical, 1600 mA maximum)
			12 VDC (< 600 mA typical, 1400 mA maximum)
	Environmental conditions (operating – non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 90%
		Maximum Wet Bulb Temperature	86° F (30° C)

SATA DVD-ROM Drive	**Height**	5.25-inch, half-height, tray-load
	Orientation	Either horizontal or vertical
	Interface type	SATA/ATAPI
	Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)

Technical Specifications - Optical Storage

Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)		
Weight (max)	2.6 lb (1.2 kg)		
Read speeds	**DVD+R/-R/+RW/ -RW/+R DL /-R DL**	Up to 8X	
	DVD-ROM	Up to 16X	
	DVD-RAM	Up to 4X	
	CD-ROM, CD-R	Up to 48X	
	CD-RW	Up to 32X	
Removable Storage – Media Compatibility – DVD-ROM	**Media**	**Read**	**Write**
	CD-ROM	Yes	No
	CD-R	Yes	No
	CD-RW	Yes	No
	DVD-ROM	Yes	No
	DVD-ROM DL	Yes	No
	DVD-RAM	Yes	No
	DVD+R	Yes	No
	DVD+R DL	Yes	No
	DVD+RW	Yes	No
	DVD-R	Yes	No
	DVD-RW	Yes	No
	DVD-R DL	Yes	No
Access times (typical reads, including setting)	**Random**	DVD: < 140 ms (typical), CD: < 125 ms (typical)	
	Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)	
	Cache Buffer	2 MB (minimum)	
	Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default)	
Power	**Source**	SATA DC power receptacle	
	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p 12 VDC ± 5%-200 mV ripple p-p	
	DC Current	5 VDC – <1000 mA typical, < 1600 mA maximum 12 VDC –< 600 mA typical, < 1400 mA maximum	
Environmental (all conditions non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)	
	Relative Humidity	10% to 90%	
	Maximum Wet Bulb Temperature	86° F (30° C)	

Technical Specifications - Optical Storage

SATA CD-RW/DVD-ROM Combo Drive	**Height**	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	SATA/ATAPI	
	Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM) Double layer: Up to 8.5 GB (12 times capacity of CD-ROM)	
	Dimensions (W x H x D)	5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm)	
	Weight (max)	2.6 lb (1.2 kg)	
	Write speeds	**CD-R**	Up to 48X
		CD-RW	Up to 32X
	Read speeds	**DVD+R/-R/+RW/ -RW/+R DL /-R DL**	Up to 8X
		DVD-ROM	Up to 16X
		CD-ROM, CD-R	Up to 48X
		CD-RW	Up to 32X
	Access time (typical reads, including settling)	**Random**	DVD: < 140 ms (typical), CD: < 125 ms (typical)
		Full Stroke	DVD: < 250 ms (typical), CD: < 210 ms (typical)
	Power	**Source**	SATA DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p
			12 VDC ± 5%-200 mV ripple p-p
		DC Current	5 VDC (< 1000 mA typical, < 1600 mA maximum)
			12 VDC (< 600 mA typical, < 1400 mA maximum)
	Environmental (all conditions non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)
		Relative Humidity	10% to 90%
		Maximum Wet Bulb Temperature	86° F (30° C)

PATA DVD+/-RW LightScribe Slim Drive	**Height**	5.25-inch, half-height, tray-load	
	Orientation	Either horizontal or vertical	
	Interface type	ATAPI/EIDE	
	Disc recording capacity	Up to 8.5 GB DL or 4.7 GB standard	
	Dimensions (W x H x D)	5.0 x 0.5 x 5.0 in (128 x 13.6 x 129 mm)	
	Weight (max)	0.42 lb (190 g)	
	Write speeds	**DVD+R**	Up to 8X
		DVD+RW	Up to 8X
		DVD+R DL	Up to 4X
		DVD-R	Up to 8X
		DVD-RW	Up to 6X
		CD-R	Up to 24X
		CD-RW	Up to 16X

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HP Compaq dc7700 Business PC

Technical Specifications - Optical Storage

Read speeds	**DVD+RW, DVD-RW, DVD-ROM, DVD+R, DVD-R**	Up to 8X
	DVD-R DL	Up to 4X
	CD-ROM, CD-R	Up to 24X
	CD-RW	Up to 24X
Access time (typical reads, including settling)	**Random**	DVD: < 140 ms (typical), CD: < 125 ms (typical)
	Full Stroke	DVD: < 250 ms (seek), CD: < 210 ms (seek)
	Stop Time	< 4 seconds
	Cache Buffer	2 MB (minimum)
	Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s – default)
Power	**Source**	Four-pin, DC power receptacle
	DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p
		12 VDC ± 5%-200 mV ripple p-p
	DC Current	5 VDC (< 1000 mA typical, 1600 mA maximum)
		12 VDC (< 600 mA typical, 1400 mA maximum)
	Total Drive Power (standby mode)	< 2.5 Watt
Audio output	**Line-Out**	0.7 VRMS
	Signal-to-Noise Ratio	74 dB
	Channel Separation	65 dB
Environmental conditions (operating – non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)
	Relative Humidity	10% to 90%
	Maximum Wet Bulb Temperature	86° F (30° C)

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Technical Specifications - Optical Storage

PATA CD-RW/DVD-ROM Combo Slim Drive	**Height**	12.7mm height slim CD-RW	
	Orientation	Either horizontal or vertical	
	Interface type	PATA/ATAPI	
	Disc capacity	Single layer: Up to 4.7 GB (6 times capacity of CD-ROM)	
	Dimensions (W x H x D)	5.0 x 0.5 x 5.0 in (128 x 13.6 x 129 mm)	
	Weight (max)	0.42 lb (190 g)	
	Write speeds	**CD-R**	Up to 24X
		CD-RW	Up to 24X
	Read speeds	**DVD+R/-R/+RW/ -RW/+R DL /-R DL**	Up to 4X
		DVD-ROM	Up to 8X
		CD-ROM, CD-R	Up to 24X
		CD-RW	Up to 24X
	Access time (typical reads, including settling)	**Random DVD**	DVD: < 140 ms (typical), CD: < 125 ms (typical)
		Random CD	DVD: < 250 ms (typical), CD: < 210 ms (typical)
		Cache Buffer	2 MB (minimum)
		Data Transfer Modes	ATA PIO mode 4); ATA Multi-word DMA mode 2; ATA UltraDMA mode 0; ATA UltraDMA mode 1, mode 2; ATA UltraDMA Mode 3 (default)
	Power	**Source**	Four-pin, DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p
		DC Current	5 VDC (< 1000 mA typical, < 1600 mA maximum)
		Total Drive Power (standby mode)	< 2.5 Watt
	Audio output level	0.7 Vrms (typical)	
	Environmental (all conditions non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)
		Relative Humidity	5% to 85%
		Maximum Wet Bulb Temperature (operating)	86° F (30° C)

QuickSpecs

Technical Specifications - Optical Storage

PATA DVD-ROM Slim Drive	**Height**	12.7mm	
	Orientation	Either horizontal or vertical	
	Interface type	PATA/ATAPI	
	Dimensions (W x H x D)	5.0 x 0.5 x 5.0 in (128 x 13.6 x 129 mm)	
	Weight (max)	0.42 lb (190 g)	
	Read speeds	**DVD+R/-R/+RW/ -RW/+R DL /-R DL**	Up to 4X
		DVD-ROM	Up to 8X
		CD-ROM, CD-R	Up to 24X
		CD-RW	Up to 24X
	Access time (typical reads, including settling)	**Random DVD**	DVD: < 140 ms (typical), CD: < 125 ms (typical)
		Random CD	DVD: < 250 ms (seek), CD: < 210 ms (seek)
		Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s)
	Power	**Source**	Four-pin, DC power receptacle
		DC Power Requirement	5 VDC ± 5%-100 mV ripple p-p
		DC Current	5 VDC - <1000 mA typical, < 1600 mA maximum
		Total Drive Power (standby mode)	< 2.5 Watt
	Audio output	**Line-Out**	0.7 VRMS
		Signal-to-Noise Ratio	74 dB
		Channel Separation	65 dB
	Environmental (all conditions non-condensing)	**Temperature**	41° to 122° F (5° to 50° C)
		Relative Humidity	5% to 85%
		Maximum Wet Bulb Temperature (operating)	86° F (30° C)

Technical Specifications - Removable Storage

HP 16-in-1 Media Card Reader	**USB Interface**	USB 2.0 High-speed device
	Advance protocol support	Supports hardware ECC (Error Correction Code) function

- Supports hardware CRC (Cyclic Redundancy Check) function
- Supports MS 4-bit parallel transfer mode
- Supports MS-PRO 4-bit parallel transfer mode
- Supports SD 4-bit parallel transfer mode
- Supports high-speed 50-MHz SD 4-bit card (version 1.1)
- Support high-speed 52-MHz MultiMediaCard 8-bit card

Supported media type with card adapter

- MicroSD (T-Flash)
- Memory Stick Micro

Mechanical

Environmental

Operational Environmental Extremes	Test Parameters/Conditions – Power applied, unit operating on system ±5% nominal supply voltage.
	10°C 10% R.H. = 24 hours
	10°C 90% R.H. = 24 hours
	20°C 90% R.H. = 24 hours
	30°C 90% R.H. = 24 hours
	40°C 90% R.H. = 24 hours
	50°C 90% R.H. = 24 hours
	50°C 10% R.H. = 24 hours
Storage Environmental Extremes	Test Parameters/Conditions
	60°C @ 80% R.H. for 96 hours
	-30°C @ 20% R.H. for 48 hours
	No power applied
	Delta °C < 1.0°C/min
	Delta % R.H. < 1.5% R.H./min

Approvals   USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.2
FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUV-T

QuickSpecs

Technical Specifications - Environmental Data

Eco-Label Certifications and declarations

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- ENERGY STAR*
- US Federal Energy Management Program (FEMP)
- Taiwan Green Mark
- China Energy Conservation Program
- IT ECO declaration
- EPEAT Rated – SILVER
- Korea Eco-label
- EPEAT
- Japan PC Green label**

* Select configurations available for ENERGY STAR compliance.
** This product conforms to the examination standards (2003 version) under JEITA's 'PC Green Label System.'

Ultra-slim Desktop

System Configuration

The configuration used for the Energy Consumption and Declared Noise Emissions data for the Ultra-slim Desktop model is based on a typically configured product.

Energy Consumption

	115 VAC	230 VAC	100 VAC
Normal Operation	105.3 W	103.0 W	106.8 W
Sleep (ENERGY STAR low power mode)	2.74 W	3.00 W	2.76 W
Off	1.58 W	1.85 W	1.57 W
Heat Dissipation*	**115 VAC**	**230 VAC**	**100 VAC**
Normal Operation	359.3 BTU/hr	351.4 BTU/hr	364.4 BTU/hr
Sleep	9.3 BTU/hr	10.2 BTU/hr	9.4 BTU/hr
Off	5.4 BTU/hr	6.3 BTU/hr	5.4 BTU/hr

* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

Technical Specifications - Environmental Data

Declared Noise Emissions
(in accordance with
ISO 7779 and ISO 9296)

	Sound Power (LWAd, bels)	**Sound Pressure** (LpAm, decibels)
System Fan Off		
Idle	3.9	29
Fixed Disk (random writes)	3.9	30
Optical Drive (sequential reads)	4.9	40

Longevity and Upgrading   This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include:

- Intel LGA775 processor socket
- 8 USB ports
- 1 empty PCI full-height slot (w/ optional PCI riser card), or
  1 empty PCIe low-profile x16 slot (w/optional PCIe riser card)
- 1 internal drive slot
- 1 Slimline optical drive slot
- 3 memory slots
- 1 Serial/Parallel adapter (optional)

Spare parts are available throughout the warranty period and or for up to 5 years after the end of production.

Batteries   This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 4000ppm by weight.

Battery size: CR2032 (coin cell)
Battery type: Lithium

Additional Information
- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the Silver level (see http://www.epeat.net)
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product contains 0% recycled materials (by wt.)
- This product is 92% recyclable when properly disposed of at end of life.

Technical Specifications - Environmental Data

Packaging Materials	Corrugated Paper	1100 g
	EPE Foam	200 g
	LDPE Bag	23 g

- The EPE foam packaging material is made from 30 to 60% recycled content.
- The corrugated paper packaging materials contains at least 80% recycled content.

Small Form Factor

System Configuration The configuration used for the Energy Consumption and Declared Noise Emissions data for the Small Form Factor Desktop model is based on a typically configured product.

Energy Consumption

	115 VAC	**230 VAC**	**100 VAC**
Normal Operation	99.0 W	94.0 W	99.5 W
Sleep (ENERGY STAR low power mode)	2.64 W	2.87 W	2.62 W
Off	1.68 W	1.87 W	1.67 W
Heat Dissipation*	**115 VAC**	**230 VAC**	**100 VAC**
Normal Operation	337.8 BTU/hr	320.7 BTU/hr	339.5 BTU/hr
Sleep	9.0 BTU/hr	9.8 BTU/hr	8.9 BTU/hr
Off	5.7 BTU/hr	6.4 BTU/hr	5.7 BTU/hr

* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

Declared Noise Emissions
(in accordance with
ISO 7779 and ISO 9296)

	Sound Power (LWAd, bels)	**Sound Pressure** (LpAm, decibels)
System Fan Off		
Idle	4.0	29
Fixed Disk (random writes)	4.0*	29**
Optical Drive (sequential reads)	5.1	41

* 4.6 with 10,000 rpm hard drive
** 37 with 10,000 rpm hard drive

Technical Specifications - Environmental Data

Longevity and Upgrading	This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include:

- Intel LGA775 processor socket
- 8 USB ports
- 2 empty PCI slots (2 low profile or 2 full-height with optional riser)
- 1 empty PCIe x1 slot
- 1 empty PCIe x16 slot
- 1 internal drive bay
- 1 SATA optical drive bay
- 1 3.5-inch external drive bay
- 4 memory slots
- 1 second Serial port (optional)

Spare parts are available throughout the warranty period and or for up to 5 years after the end of production.

Batteries   This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 4000ppm by weight.

Battery size: CR2032 (coin cell)
Battery type: Lithium

Additional Information
- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the Silver level (see http://www.epeat.net)
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product contains 0% recycled materials (by wt.)
- This product is 91% recyclable when properly disposed of at end of life.

Packaging Materials

	Corrugated Paper	1600 g
	EPE Foam	20 g
	LDPE Bag	52 g

- The EPE foam packaging material is made from 30 to 60% recycled content.
- The corrugated paper packaging materials contains at least 80% recycled content.

Convertible Minitower

Technical Specifications - Environmental Data

System Configuration	Processor	Intel Pentium D 945 Processor (3.4-GHz, 2x2MB L2 cache, 800-MHz FSB)
	Memory	1-GB DDR2 Synch Dram PC2-5300 (667-MHz)
	Hard Drive	80-GB SATA 3.0-Gb/s (7200 rpm)
	Optical Drive	SATA DVD-ROM Drive
	Communications	Integrated Intel 82566DM Gigabit Network Connection, Agere 2006 PCI 56K International SoftModem

Energy Consumption

	115 VAC	230 VAC	100 VAC
Normal Operation	92.2 W	87.2 W	91.7 W
Sleep (ENERGY STAR low power mode)	2.38 W	2.88 W	2.34 W
Off	1.01 W	1.45 W	0.98 W

Heat Dissipation*	115 VAC	230 VAC	100 VAC
Normal Operation	337.8 BTU/hr	320.7 BTU/hr	339.5 BTU/hr
Sleep	9.0 BTU/hr	9.8 BTU/hr	8.9 BTU/hr
Off	5.7 BTU/hr	6.4 BTU/hr	5.7 BTU/hr

* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

Declared Noise Emissions
(in accordance with
ISO 7779 and ISO 9296)

	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
System Fan Off		
Idle	4.0	23
Fixed Disk (random writes)	4.1*	24**
Optical Drive (sequential reads)	4.9	32

* 5.3 with 10,000 rpm hard drive
** 37 with 10,000 rpm hard drive

Technical Specifications - Environmental Data

Longevity and Upgrading This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the product may include:

- Intel LGA775 processor socket
- 8 USB ports
- 4 empty full-height PCI slots (2 standard, 2 optional)
- 1 empty full-height PCIe x1 slot
- 1 empty full-height PCIe x16 slot
- 2 internal 3.5-inch drive bays
- 3 external 5.25-inch SATA drive bays
- 1 external 3.5-inch drive bay
- 4 memory slots
- 1 second Serial port (optional)

Spare parts are available throughout the warranty period and or for up to 5 years after the end of production.

Batteries This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 4000ppm by weight.

Battery size: CR2032 (coin cell)
Battery type: Lithium

Additional Information
- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the Silver level (see http://www.epeat.net)
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product contains 0% recycled materials (by wt.)
- This product is 97% recyclable when properly disposed of at end of life.

Packaging Materials

Corrugated Paper		1642 g
EPE Foam		399 g
LDPE Bag		63 g

- The EPE foam packaging material is made from 30 to 60% recycled content.
- The corrugated paper packaging materials contains at least 80% recycled content.

Ultra-slim Desktop, Small Form Factor, Convertible Minitower

Technical Specifications - Environmental Data

RoHS Compliance
Hewlett-Packard is committed to compliance with all applicable environmental laws and regulations, including the European Union Restriction of Hazardous Substances (RoHS) Directive. HP's goal is to exceed compliance obligations by meeting the requirements of the RoHS Directive on a worldwide basis. From July 1, 2006, RoHS substances will be virtually eliminated (virtually = to levels below legal limits) for all HP electronic products subject to the RoHS Directive, except where it is widely recognized that there is no technically feasible alternative (as indicated by an exemption under the EU RoHS Directive).

Material Usage
This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the
Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

Packaging
HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

End-of-life Management and Recycling
Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted

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on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

Hewlett-Packard Corporate Environmental Information	For more information about HP's commitment to the environment: [link to new HP white paper now in progress] Global Citizenship Report http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html Eco-label certifications http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html ISO 14001 certificates: http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html