Service Reference Card

HP Compaq dx7200 and dc7600 Series Personal Computers

Key Specifications

Processor Type:	Intel Pentium 4, Intel Pentium D, or Intel Celeron D
RAM Type:	DDR PC2 4200 and PC2 5300 non-ECC
Maximum RAM Supported:	up to 4 GB depending on the model [1]
Expansion Bus:	PCI 2.3, PCI Express
Graphics Adapter	Integrated controller, PCI Express or PCI 2.3 support depending on model
Hard drive interface:	SATA
I/O Interfaces:	Serial (1 std, 1 optional {2}), parallel (1 [3]), USB 2.0 (8), diskette drive (1), RJ-45 (1) Audio in and out (front and rear)

[1] USDT supports only 3 GB RAM
[2] No option of MT
[3] Plus 1 optional on USDT

System Setup and Boot

Basic system information regarding file, storage, security, and power configuration is main-tained in the Setup Utility held in the system ROM. The Setup Utility is accessed by pressing the F10 key as soon as the computer is turned on. If the screen prompt opportunity is missed, a restart will be necessary.

Note: Not all features are available on all models.

Computer Setup Menu

Heading	Option / Description
File	System Information - Lists product name, processor type/speed/step-ping, cache size, installed memory size/speed, no. channels, integrated MAC for enabled or embedded NIC, system ROM BIOS/family name/version, chassis serial number, and asset tracking number.
	About - Provides copyright information.
	Set Time and Date - Allows selection of system time and date.
	Flash System ROM - Allows selection of a drive containing a new BIOS.
	Replicated Setup -Allows saving to and restoring from removable media.
	Default Setup - Allows both saving current settings and restoring factory settings as defaults.
	Apply Defaults and Exit - Applies currently selected default settings and clears all passwords.
	Ignore Changes and Exit - Exits Computer Setup without applying or saving any changes.
	Save Changes and Exit - Saves changes to system configuration and exits Computer Setup.
Storage	Device Configuration - Lists all installed BIOS storage devices. The fol-lowing options appear when a device is selected.

Diskette Type (legacy diskette drives only) Identifies the highest capacity media type accepted by the diskette drive.

Drive Emulation (IDE devices only) Selects drive type emulation for storage

Drive Type	Emulation Options
ATAPI Zip Drive	None (treated as other), diskette (treated as diskette drive).
ATA Hard drive	None (treated as other), disk (treated as hard drive).
Legacy Diskette	No emulation available.
IDE CD-ROM	No emulation available.
ATAPI LS-120	None (treated as other), diskette (treated as diskette drive).

Default Values IDE/SATA

Multisector Transfers (ATA disks only). Selects number of sectors transferred. Options are disabled, 8, and 16.

Transfer Mode (ATA devices only). Selects active data transfer mode. Options are PIO 0, Max PIO, Enhanced DMA, Ultra DMA 0, and Max UDMA.

Translation Mode (ATA disks only). Selects translation mode to enable the BIOS to access disks partitioned and formatted on other systems and may be necessary for users of older versions of Unix. Options are: Automatic, Bit-Shift, LBA Assisted, User, and None.
NOTE: The translation mode automatically selected by BIOS should usually not be changed.

Translation Parameters (ATA disks only). Allows you to specify disk parameters logical cylinders (max. of 1024), heads (max. of 256), and sectors per track (max. of 63) used by BIOS to translate disk I/O requests. Fields are visible and changeable only when drive translation mode is set to User.

Storage Options	
	Removable Media Boot. Enables/disables ability to boot system from removable media.
	Legacy Diskette Write. Enables/disables ability to write data to legacy diskettes.
	BIOS DMA Data Transfers. Allows control of BIOS I/O requests. Enable allows read and write with DMA trans-fers. Disable allows read and write with PIO transfers.

Computer Setup Menu (Continued)

Heading	Option / Description	
Storage (continued)	Storage Options (ctd)	SATA Emulation. Allows method of accessing SATA controller and devices. Default is Separate IDE Control-ler. Option is combined IDE Controller
		IDE Controller. Enable/disable primary IDE controller.
		Primary SATA Controller - Enable/disable.
		Secondary SATA Controller - Enable/disable.
	DPS Self-Test - Allows execution of self-tests on ATA hard drives capa-ble of Drive Protection System (DPS) tests.	
	Boot Order - Allows selection of priority in the boot sequence. Each drive may be included or excluded. May use **F9** on rebooting to select a one time boot override to a selected bootable device.	
Security	Smart Card Options - Enable/disable Smart Card to be used in place of Power-On Password.	
	Setup Password - Enable/disable setup (administrator) password.	
	Power-On Password - Enable/disable power-on password.	
	Password Options (appears if Power-On or Setup password is set) - Enable/disable password for warm boot.	
	Smart Cover Lock (some models) - Enable/disable Smart Cover Lock.	
	Embedded Security - Enable/disable Embedded Security device. Reset device to Factory Settings.	
	Device Security - Enable/disable serial/parallel/USB ports, system audio, NIC (some models).	
	Network Service Boot - Enables/disables Network Service Boot (some models).	
	System IDs - Allows setting of Asset and Ownership Tags, chassis serial number, keyboard locale, and Universal Unique Identifier (UUID).	
	DriveLock -Manages passwords and security states for drives that sup-port the ATA Security command set.	
	OS Security - Enable /disable Data Execution Prevention; Enable/dis-able Intel Virtualization.	
	Data Execution Prevention - Enable/disable to prevent OS Security breaches.	
Power	OS Power Management - Enable/disable processor voltage and fre-quency during run and idle times; ACPI S3 support; USB Wake on Device Insertion.	
	Hardware Power Management - Enable/disable SATA bus and/or device power management.	
	Thermal - Fan idle mode to control minimum fan speed.	
Advanced (advanced users only)	Power-On Options - Select POST mode for QuickBoot, FullBoot, Full-Boot every 1-30 days; Enable/disable POST messages; Enable/disable option ROM prompt; Enable/disable I/O APIC mode; Select computer state after power loss; Select wakeup boot source; Enable/disable POST delay (for slow hard drives); Enable/disable ACPI/USB buffers; Enable/disable Hyper-threading; Enable/disable SetUp Browse Mode; Limit CPUID to max value of 3.	
	Executive Memory Test - Restarts computer and executes POST mem-ory test.	
	BIOS Power-On - Set computer to turn on at specific time of day.	
	Onboard Devices - Set resources for onboard devices (serial/parallel port or diskette controller).	
	PCI Devices - Lists currently installed PCI devices and IRQ settings. Allows configuration/disabling of devices (no effect on APIC systems)	
	Bus Options - Enable/disable PCI bus mastering, PCI VGA palette snooping, PCI SERR# function, and ECC on select systems.	
	Device Options - Set printer mode (bidirectional output only); Num Lock State; Wake-up events; processor cache; unique sleep state blink patterns; integrated video; monitor tracking; NIC PXE Option ROM download.	
	PCI VGA Configuration - Allows selection of VGA controller (if multi-ple PCI video controllers are installed).	

Failsafe Boot Block ROM
The Boot Block is a flash-protected section of the ROM that contains code that checks for a valid system BIOS image when the system is turned on.
- If the system BIOS image is valid, the system starts normally.
- If the system BIOS image is not valid, a failsafe Boot Block BIOS provides enough support to:
 - search rempvable media for BIOS image files. If an appropriate BIOS image is found, it is automatically flashed into the ROM.
 - start the system from bootable removable media that automaticly invokes system BIOS upgrade utilities.
When an invalid system BIOS image is detected, the system power LED will blink red 8 times, one blink every second. Simultaneously, the speaker will beep 8 times. If the portion of the sys-tem ROM containing the video option ROM image is not corrupt, "Boot Block Emergency Recovery Mode" will be displayed on the screen. To recover the system after it enters Boot Block Emergency Recovery Mode, complete the following steps:

1. Remove all removable media removable storage options.
2. Turn off the power.
3. Insert a diskette, CD, or USB flash device containing the desired BIOS image file in the root directory.
Note: The media must be formatted using the FAT 12, FAT 16, or FAT 32 file system.
4. Turn on power to the system. If no appropriate BIOS image is found, the failsafe Boot Block BIOS will attempt to start the system from a bootable device. If no bootable device is found, you will be prompted to insert media containing a BIOS image file or BIOS upgrade utility. If the system successfully reprograms the ROM, the system will automatically restart.

Security Functions

The system offers independent Power-On and Setup passwords for system and data protection. The Power-On password protects the computer from unauthorized access by prompting the user for a password during power up. The Setup password protects the computer from unauthorized or inadvertent re-configuration of legacy device resource settings or ROM flash upgrade by prompting the user for a password prior to entering the Setup Utility.

To establish a password:

1.   Turn on or restart the computer. If you are in Windows, click Start > Shut Down > Restart the computer.

Security Functions *(Continued)*

2. As soon as the computer is turned on, press and hold **F10** until you enter Computer Setup. Press Enter to bypass the title screen, if necessary. If you do not press **F10** as soon as the computer starts, a restart will be necessary.

3. Select Security, then select Setup Password or Power-On Password and follow the instructions on the screen.

Before exiting, click File > Save Changes and Exit.

To change a Power-On or Setup password:

1. Turn on or restart the computer. If you are in Windows, click Start > Shut Down > Restart the Computer. Run Computer Setup (F10).

When the key icon appears, type your current password, a slash (/) or alternate de-limiter character, your new password, another slash (/) or alternate delimiter character, and your new password again as shown:
current password/new password/new password.

NOTE: Type the new password carefully since the actual characters do not appear on the screen.

2. Press the enter key.

The new password will take effect the next time the computer is restarted.

To delete a password using Setup:

1. Turn on or restart the computer. If you are in Windows, click Start > Shut Down > Restart the Computer. To delete the setup password, run Computer Setup (F10).

2. When the key icon appears, type your current password followed by a slash (/) or alternate delimiter character as shown. Example: currentpassword/

3. Press the Enter key.

To delete or disable the Power On and Setup passwords:

1. Shut down (Power down) the system and disconnect the power cord from the outlet or the system unit.

2. Remove the chassis cover.

3. On the system board, remove the jumper on pins 1 and 2 of header E49 and place only on pin 2.

4. Replace the chassis cover and reconnect the power cord.

NOTE: Setup password may be used in place of Power-on password to boot system.

Security Features

Feature	Purpose	How It Is Established
Removable Media Boot Control	Prevents booting from removable media drives.	Setup Utilities. [1]
Serial, Parallel, USB, or Infrared Interface Control	Prevents data transfer through integrated serial, parallel, USB, or infrared interface.	Setup Utilities. [1]
Power-On Password	Prevents use of computer until password is entered. Can apply to both initial startup and restart.	Setup Utilities. [1]
Setup Password	Prevents reconfiguration of computer until password is entered.	Setup Utilities. [1]
Network Server Mode	Provides unique security features for computer used as server.	Setup Utilities. [1]
DriveLock [3]	Prevents unauthorized access to data on drives supporting password protection.	Setup Utilities. [1]
Smart Cover Lock [2, 3]	Software-controllable solenoid that, when activated, prevents unauthorized access to chassis interior.	Setup Utilities. [1]
Smart Cover Sensor [3]	Indicates computer cover or side panel has been removed. Can be set to require password for restart after cover or panel removal.	Setup Utilities. [1]
Drive Protection System (DPS	Diagnostic tool built into hard drives on select models designed to discover problems that might result in unwarranted drive replacement.	Setup Utilities or Diagnostics for Windows.
Memory Change Alerts	Detects addition or removal of memory modules. Notifies system administrator.	Refer to Intelligent Manageability Guide.
Ownership Tag	Displays ownership information as defined by system administrator during system startup. (Protected by setup password).	Setup Utilities. [1]
Kensington CableLock Provision	Inhibits access to interior of computer chassis. Can also be used to secure computer to a fixed object for prevent theft.	Requires Kensington cable lock accessory to secure computer to a fixed object.

NOTES:
[1] For more information about Setup Utilities refer to the Computer Setup Guide.
[2] If for any reason the Setup utility is not accessible to unlock the Smart Cover Lock then a FailSafe key is required to bypass the Smart Cover Lock and open the computer. Refer to the Hardware Reference Guide on how to use the FailSafe key. To order a Fail-Safe key contact HP.
[3] Available on some models.

Diagnostic Functions

Diagnostic functions are provided by the Setup Utility (in system ROM) and by Insight Diag-nostics. Insight Diagnostics provides detailed system information including:

- Processor type and speed
- Memory amount, mapping, and integrity
- Hardware peripheral availability/settings
- Hard drive type, space used/available
- System identification, asset tracking

Insight Diagnostics may be found on the *Documentation CD* that ships with the computers.

Error Conditions and Messages

Chassis LED and Beep Messages

Power LED	# Beeps	Event
Steady green	None	S0 System on (normal operation)
Blinks green @ 0.5 Hz	None	S1 Suspend
Blinks green @ 0.5 Hz	None	S3 Suspend to RAM
Off (clear)	None	S4 Suspend to disk
Off (clear)	None	S5 Soft off
Blinks red 2 times @ 1 Hz [1]	2	Processor thermal shutdown
Blinks red 3 times @ 1 Hz [1]	3	Processor not seated / installed
Blinks red 4 times @ 1 Hz [1]	4	Power supply failure
Blinks red 5 times @ 1 Hz [1]	5	Memory error
Blinks red 6 times @ 1 Hz [1]	6	Video error
Blinks red 7 times @ 1 Hz [1]	7	PCA failure
Blinks red 8 times @ 1 Hz [1]	8	Invalid ROM checksum (error)
Blinks red 9 times @ 1 Hz [1]	9	Wrong power supply input voltage
Blinks red 10 times @ 1 Hz [1]	10	Bad option card

NOTE: Power LED blinks are repeated after a 2 second pause until issue is resolved,. Beeps continue for 5 iterations and then stop.

Common POST Error Messages

Screen Message	Beeps	Probable Cause	Recommended Action
101-Option ROM Error	1L, 1S	1. System ROM checksum error. 2. Expansion card. 3. CMOS corruption. 4. System board	1. Verify ROM, reflash if required. 2. Remove suspected expansion card, reboot. 3. Clear CMOS memory, reboot. 4. Replace system board.
103-System Board Failure	none	DMA, timers	1. Clear CMOS memory. 2. Remove expansion boards. 3. Replace system board.
164-Memory Size Error	2S	Incorrect memory configuration.	1. Run Setup (F10). 2. Check DIMMs for proper seating, proper type, and HP compatibility. 3. Remove DIMMs singularly and reboot to isolate faulty DIMM.
201-Memory Error	none	RAM failure.	Same as 164.
214-DIMM Configura-tion Warning	none	Populated DIMM configuration is not optimized.	Rearrange the DIMMs so that each channel has the same amount of memory.
301-, 304- Keyboard Error	none	Keyboard failure.	Check keyboard connection or keys. Replace keyboard. If 304, possible system board problem
501-Display Adapter Failure	1L, 2S	Graphics controller.	1. Reseat graphics card. 2. Check monitor connection. 3. Replace graphics card.
1720-SMART Hard Drive Detects Imminent Failure	none	Hard drive is about to fail.	Run drive protection system test if available. Check for firmware patch for erroneous error message.
1794-Inaccessible devices attached to SAATA 1 and/or SATA 3	none	A device is attached to SATA 1 and/or SATA 3.	If using Windows 2000 or Windows XP, change "SATA Emulation" to "Separate IDE Controller" in Computer Setup. If not using these operating systems, relocate the devices to SATA 0 or 1.
1796-SATA Cabling Error	none	One or more SATA devices are improperly attached.	Ensure SATA connections are used in ascending order starting with SATA 0.

NOTES: L = long, S = short