Service Reference Card

HP Compaq d220/d228/d230 Series Personal Computers

Key Specifications

Processor Type:	Intel Celeron or Pentium 4
RAM Type:	DDR PC2100 or PC2700 non-ECC
Maximum RAM Supported:	2 GB
Expansion Bus:	PCI 2.2
Graphics Adapter	Integrated controller. AGP support on select models.
Hard drive interface:	UATA/100
I/O Interfaces:	Serial (1), parallel (1), USB 2.0 (6), diskette drive (1)

System Setup and Boot

Basic system information regarding system information, setup, power management, hardware, and passwords is maintained in the Setup Utility held in the system ROM. The Setup Utility is accessed by pressing the F10 key when prompted (on screen) to do so during the boot sequence. If the screen prompt opportunity is missed, a restart will be necessary.

Computer Setup Menu

Heading	Option / Description
System Information	Lists the following main system specifications: • Serial Number • Product Name • Chipset type • BIOS Version • BIOS Release Date • Processor Type • Processor Speed • CPU ID • L1 and L2 Cache Size • Memory Information
Standard CMOS Setup	System Time (hh/mm/ss) - Allows you to set system time. (24 hour format)
	System Date (mm/dd/yyyy) - Allows you to set system date.
	Floppy Drive A - Calculates size and capacity of diskette drive.
	Primary IDE Master - Auto detects which hard drive is the Primary Master drive.
	Primary IDE Slave - Auto detects which hard drive is the Primary Slave drive.
	Secondary IDE Master - Auto detects which hard drive is the Secondary Master drive.
	Secondary IDE Slave - Auto detects which hard drive is the Secondary Slave drive.
Advanced CMOS Setup	Boot Device Priority — Specifies the boot order for all devices.
	Try Other Boot Device — Set this option to YES to instruct the BIOS to boot from other bootable devices not specified under "Boot Device Priority."
	POST Delay Time (seconds) — Sets the amount of time before the Setup Utility prompt (F10-Setup) appears when the computer boots. • None: POST delay time disable (Default) • 5: POST Delay 5 seconds • 15: POST Delay 15 seconds • 25: POST Delay 25 seconds • 35: POST Delay 35 seconds
	System Keyboard — Detects if a keyboard is present when the computer boots. • Absent: keyboard not detected (default) • Present: keyboard detected
	APIC ACPI SCI IRQ — Enables or disables the internal I/O APIC and Multiprocessor Tables. (Disabling the APIC ACPI SCI IRQ may require you to reinstall the operating system.) • Enable: IRQ 20-23 (Default) • Disable: IRQ 01-11
	Hyper-Threading Technology — Enables or disables the Intel Hyper-Threading Technology. (This item is only selectable with the Intel HHT CPU plug-in.) • Enable: Intel HTT function enabled (BIOS auto detect) • Disable: Intel HTT function disabled (BIOS auto detect)
	Internal Graphic Mode Select — Selects the size of memory for internal graphic adapter. • 512KB: Share 512KB • 1MB: Share 1MB • 8MB: Share 8MB (Default)
Power Management Setup	ACPI Standby State — Sets the ACPI Standby State when system goes into ACPI Standby Mode. • S1/POS: Power on Suspend • S3/STR: Suspend to RAM (Default)

Computer Setup Menu *(Continued)*

Heading	Option / Description
Power Management Setup (Continued)	Reset on AC/Power Loss — Sets the system status after AC power loss. • Power Off: System always Powers Off (Default) • Power On: System always Powers On • Last State: System returns to the last state before AC power loss
	Resume on Ring — Sets the Resume on Ring from soft off. • Disable: Ring Resume disable (Default) • Enable: Ring Resume enable
	Resume on LAN — Sets the Resume on LAN from soft off. • Disable: LAN Resume disable • Enable: LAN Resume enable (Default)
	Resume on PME — Sets the Resume on PME from soft off. • Disable: PME Resume disable • Enable: PME Resume enable (Default)
Peripheral Setup	OnBoard LAN — Enables or disables the OnBoard LAN. • Disable: OnBoard LAN disabled • Enable: OnBoard LAN enabled (Default)
	OnBoard LAN Chip Boot ROM — Enables or disables the OnBoard LAN Chip Boot ROM. • Disable: OnBoard LAN Chip Boot ROM disabled • Enable: OnBoard LAN Chip Boot ROM enabled (Default)
	Init. Graphics Adapter Priority — Sets the initial priority of the graphics adapter NR138 GE (d220/d228) • AGP/Int-VGA • AGP/PCI (Default) • PCI/VGA • PCI/Int-VGA NR138 GV (d230) • PCI/Int-VGA (Default)
	USB Controller — Enables or disables the USB Controller. • Disable: USB Controller disabled • Enable: USB Controller enabled (Default)
	USB 1.1 Device Legacy Support — Sets the USB 1.1 Device Legacy Support under DOS Mode. • Disable: USB 1.1 Device Legacy Support disabled • No Mice: A mouse is not supported • All Device: All devices are supported
	OnBoard Serial Port — Sets the OnBoard Serial Port settings • Auto (Default) • Disable • 3F8/COM1 • 2F8/COM2 • 3E8/COM3 • 2E8/COM4
	OnBoard Parallel Port — Sets the OnBoard Parallel Port settings • Auto (Default) • Disable • 378 • 278
Hardware Monitor	CPU Ratio Selection — Allows you to setup the CPU Multiplier Ratio for unlocked Intel P4 and Celeron processors.
	CPU Warning Temperature — Warns when CPU temperature exceeds 85°/185°F.
	CPU Shutdown Temperature — System will shutdown when CPU temperature is greater than 90°/194°F.
	System Warning Temperature — Warns when system temperature is greater than 60°C/140°F.
	System Shutdown Temperature — System will shutdown when system temperature is greater than 65°C/149°F.
	CPU Temperature — Detects current CPU temperature
	System Temperature — Detects current system temperature
	CPU FAN Speed — Detects CPU FAN speed
	Chassis FAN Speed — Detects current chassis FAN speed
	CPU VID — Detects current CPU voltage
	Vccp — Detects current Vccp voltage
	+1.5V — Detects current ATX power +1.5V
	+2.5V — Detects current ATX power +2.5V
	+3.3V — Detects current ATX power +3.3V
	+5.0V — Detects current ATX power +5.0V
	+12.0V — Detects current ATX power +12.0V
Password Option	Change Supervisor Password — Allows you to set and change the supervisor password
	Password Status — Shows password status
	Password Check — Allows you to set the password check when the supervisor password is set up • Setup: Password prompt appears when BIOS is executed • Always: Password verification is checked every time the computer boots (Default)
Load default Settings	None — Loads the optimum default values for all of the setup options.
Save Settings and Exit	None — Saves changes and exits setup.
Exit Without Saving	None — Allows you to exit setup without saving any changes.

Failsafe Boot Block ROM

The computer comes with a reprogrammable flash system ROM (read only memory). To upgrade the ROM, you may:

a. Order an upgraded ROMPaq diskette from HP.
or
b. Download the latest ROMPaq images from the HP Web site (www.hp.com)

All ROMPaq ROM images from HP are digitally signed to ensure authenticity and minimize potential corruption. Your system ROM includes a Failsafe Boot Block that is protected during the flash process and allows the computer to be restarted in the unlikely event of an unsuccessful ROM flash.

If the system detects an invalid system ROM during the boot sequence the system will search for the diskette drive. To recover from the Boot Block recovery mode complete the following steps:

Boot Block Recovery

1. Remove any diskettes from the diskette drive and turn off power.
2. Insert a ROMPaq diskette into the diskette drive.
3. Turn on power to the system.
4. The system will automatically flash the ROM, load the BIOS default, and then boot to the operating system.

Security Functions

The system offers a single supervisor password for system and data protection.
The password, if established, protects the computer from unauthorized access by prompting the user for a password during power up. The password, if established, protects the computer from unauthorized or inadvertent re-configuration by prompting the user for a password prior to entering the Setup Utility.

Establishing a password:

1. Turn on or restart the computer. If you are in Windows, click Start > Shut Down > Restart the computer.
2. When the F10 Setup message appears in the lower-right corner of the screen, press the F10 key. Press Enter to bypass the title screen, if necessary. If you do not press F10 when prompted, a restart will be necessary.
3. Select Password Option, then select Change Supervisor Password and follow the instructions on the screen. You may also want to establish the Password check at this time. This will allow you to specify when the password will be required.
4. Before exiting, click Save Settings and Exit.

Changing a password:

1. Turn on or restart the computer. If you are in Windows, click Start > Shut Down > Restart the Computer. To change the setup password, run Computer Setup.
2. 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.
3. Press the enter key.

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

Deleting a password

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.

Clearing CMOS

Clearing CMOS also clears all passwords.

1. Shut down the system and disconnect the power cord from the power outlet.
2. Remove the chassis access panel.
3. On the system board, press the CMOS button and hold it down for 5 seconds.
4. Replace the chassis access panel and reconnect the power cord.
5. Turn on the computer and allow it to start.

Security Features

Feature	Purpose	How It Is Established
Removable Media Boot Control	Prevents booting from removable media drives.	Setup Utilities
Serial, Parallel, USB, or Infrared Interface Control	Prevents data transfer through integrated serial, parallel, or USB interface.	Setup Utilities
Supervisor Password	Prevents use of computer until password is entered. Can apply to both initial startup and restart.	Setup Utilities
Supervisor Password	Prevents reconfiguration of computer until password is entered.	Setup Utilities.
Master Boot Record (MBR) Security	May prevent unintentional or malicious changes to MBR of the current bootable disk and provides a means of recovering "last known" parameters.	Setup Utilities
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.

NOTE:
For more information about Setup Utilities refer to the Computer Setup Menu on the previous page.

Diagnostic Functions

Diagnostic functions are provided by the Setup Utility (in system ROM) and by Diagnostics for Windows. Diagnostics for Windows 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

Diagnostics for Windows may be pre installed on some models and can be downloaded free of charge from www.hp.com.

Error Conditions and Messages

Chassis Diagnostic LEDs

Power LED	Event
Steady green	(S0) System on (normal operation)
Blinks green @ 0.5 Hz	(S1) Normal Suspend
Blinks green @ 0.5 Hz	(S3) Suspend to RAM
Off (clear)	(S4) Suspend to disk
Off (clear)	(S5) Computer off
Blinks red @ 1Hz Blinks Green @ 1 Hz	Red when ROM being flashed. Boot Block recovery with embedded video. Green when user can restart.
Blinks red 1 times @ 2 Hz *	Processor thermal shutdown
Blinks red 5 times @ 1 Hz *	Memory not seated / installed
Blinks red 6 times @ 1 Hz *	Graphics card error
Blinks red 7 times @ 1 Hz *	System board failure

NOTE:
* Repeated after 2 second pause

Common POST Error Messages

Screen Message	Probable Cause	Recommended Action
Parity Error	Fatal memory parity error. System halts after displaying this message.	Reseat memory modules. Replace memory modules
... Master/... Slave Hard Disk Error	(Primary/Secondary) Master/Slave hard drive could not be initialized by the BIOS.	Reseat the device data and power cables. Replace the device data cable. Replace the device. Replace the system board.
...Master/Slave Drive — ATAPI Incompatible	Device configured as a (Primary/Secondary) Master/Slave failed an ATAPI compatibility test.	Replace the device. Replace the system board.
SMART capable but Command Failed. SMART Command Failed	BIOS unable to send a SMART message to the device.	Backup the data on the hard drive. Replace the hard drive.
SMART status Bad, Backup and replace. SMART Capable and Status Bad.	SMART capable hard drive detects an imminent failure.	Backup the data on the hard drive. Replace the hard drive.
DMA-1 Error DMA-2 Error DMA Controller Error	Error when initializing the DMA controller.	Reconnect the cables on the peripheral device. Replace the data cable. Replace the device. Replace the system board.
Checking NVRAM...Update Failed	BIOS could not write to the NVRAM block.	Change system board jumper JP2 to pins 2-3, then flash the system BIOS. Reset jumpers to 1-2. Replace the system board.
NVRAM Ignored or NVRAM Bad	NVRAM data used to store plug and play data was not used for system configuration in POST.	Restart computer, access Computer Setup. Select **Load Default Settings** > **Save and Exit**. Change system board jumper JP2 to pins 2-3, then flash the BIOS. Reset jumpers to 1-2.
NVRAM Checksum Bad, NVRAM Cleared	Error detected while validating NVRAM data.	Restart the computer, use the F10 Key to access Computer Setup, Select **Load Default Settings** > **Save and Exi**t.
Microcode Error	BIOS could not find or load CPU microcode to update the CPU.	Ensure the system board BIOS supports the processor. Change system board jumper JP2 to pins 2-3, then flash the BIOS. Reset jumpers to 1-2.