Illustrated Parts & Service Map

HP 500B MT EU Business PC

Document Number 630795-001. 1st Edition July 2010.

Key Specifications

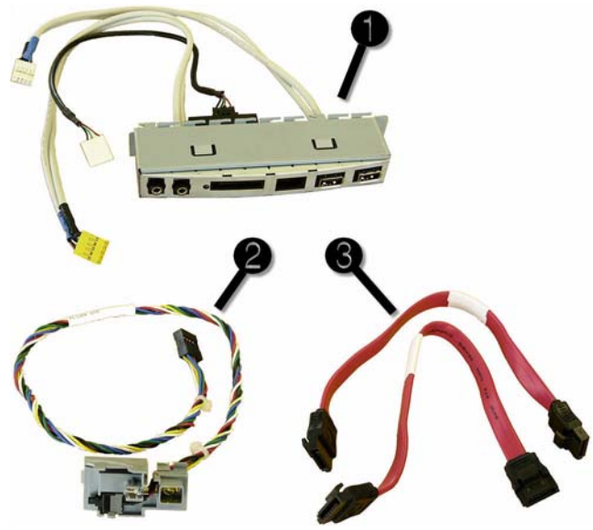
Processor Type	Intel Celeron, Intel Pentium dual-core
RAM Type	DDR3-SDRAM DIMMs, PC3-10600 (1333 MHz)
Maximum RAM Supported	4 GB (2 x 2 GB)
Expansion Slots	• 1 full-height PCI 2.3 slot • 2 full-height PCIe x1 slots • 1 full-height PCIe x16
Graphics Adapter	Intel Graphics Media Accelerator X4500
Chipset	Intel G41 Express
Drive Support	• (1) 5.25-inch external optical drive bay • (1) 3.5-inch internal hard disk drive bay
I/O Interfaces	(8) USB 2.0 ports: (2) front ports, (4) rear ports, (2) internal ports on motherboard; (1) RJ-45, (1) VGA, (1) front audio in, (1) front audio out, (1) rear audio in, (1) rear audio out, (1) rear microphone
Operating Systems	• Windows 7 • Windows Vista • Windows XP • FreeDOS • Novell SLED 11

Spare Parts

System Unit

1	Chassis	Not spared
2	Front bezel with card reader slot	616793-001
3	Access panel	616791-001
*	Thumbscrew for use on access panel	448665-001
4	Power supply, 300W, PFC	592502-001
*	5.25-inch bezel blank	586749-001

** Not shown*



Cables

1	Front I/O assembly with card reader	586728-001
2	Power switch/LED cable assembly	586724-001
3	SATA HDD cable, 6.5 inch, with latch	448670-001
*	PATA to SATA adapter	449283-001

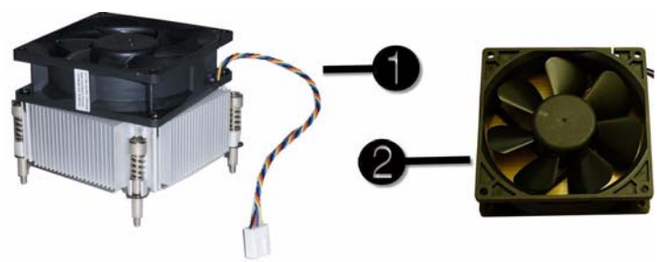
**Not shown*

Keyboards (not illustrated)

USB, blue		**537924-xxx**	
BHCSY	-B41	Norwegian	-091
Bulgarian	-261	Polish	-241
Czech	-221	Portuguese	-131
Dutch	-331	Romanian	-271
Finnish	-351	Russian	-251
French	-051	Saudi Arabia	-171
German	-041	Slovakian	-231
Greek	-151	Spanish	-071
Hebrew	-BB1	Swedish	-101
Hungarian	-211	Swiss	-111
International English	-L31	Turkish	-141
Italian	-061	U.K.	-031

Mass Storage Devices (not illustrated)

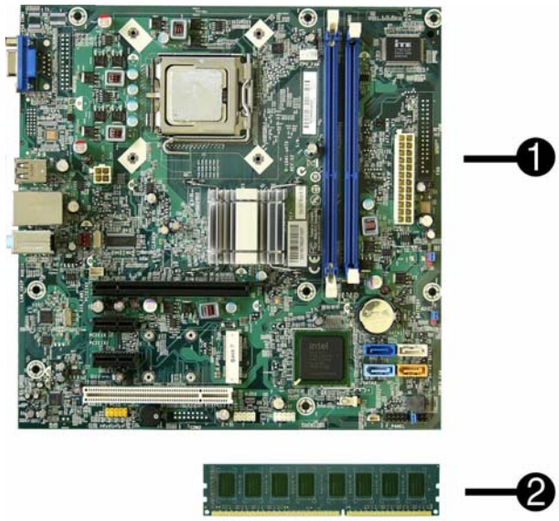
16X DVD±RW SuperMulti drive with LightScribe	581059-001
640 GB hard drive	613204-001
500 GB hard drive	586720-001
320 GB hard drive	586969-001
160 GB hard drive	586718-001



Miscellaneous Parts

1	Heat sink, Intel class F plus (includes thermal material)	616605-001
2	Chassis fan	449207-001
*	Mouse, optical, carbon	444740-001

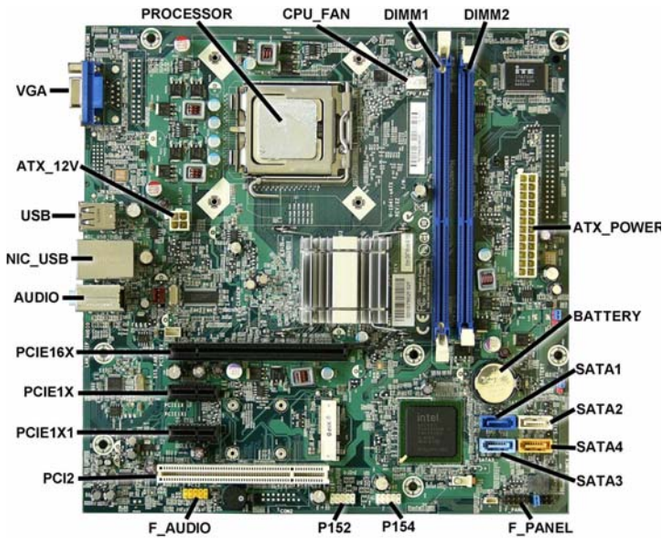
**Not shown*



Standard and Optional Boards

System boards with thermal grease, alcohol pad, and CPU socket cover		
1	System board	616409-001
Memory modules		
2	2 GB, PC3-10600	576110-001
2	1 GB, PC3-10600	576109-001
Other boards		
LSI 56K modem, PCIe		490689-001
ATI Radeon HD5450 PCIe graphics card, 1 GB		601155-001
ATI Radeon HD4350 (RV710) PCIe x16 graphics card, 512 MB		586750-001
GeForce GT320 1-GB PCIe graphics card		615793-001
GeForce G315, PCIe graphics card, 1 GB		617080-001
GeForce G315, PCIe graphics card, 512 MB		619934-001
GeForce G210, PCIe graphics card, 512 MB		586382-001
Intel Gigabit NIC, includes bracket		490367-001
1394 PCI card, 3 port		441448-001
HP FireWire IEEE 1394 PCI card, FH		515182-001
Intel Celeron Processors with alcohol pad and thermal grease:		
E3400, 1-MB cache, 2.60 GHz		602071-001
E3300, 1-MB cache, 2.50 GHz		585886-001
Intel Core2 Duo Processors with alcohol pad and thermal grease:		
E7600, 3-MB cache, 3.06 GHz		573954-001
E7500, 3-MB cache, 2.93 GHz (primary) E7500, 3-MB cache, 2.93 GHz (alternate)		531988-001 583006-001
E6700, 2-MB cache, 3.20 GHz		617840-001 418950-001
E6600, 2-MB cache, 3.06 GHz		602070-001
E6500, 2-MB cache, 2.93 GHz		586748-001
E5500, 2-MB cache, 2.80 GHz		613035-001
E5400, 2-MB cache, 2.70 GHz		586743-001

System Board



System Board Connectors and Jumpers (position of some untitled components may vary in location)

PROCESSOR	Processor socket	PCI2	PCI slot
CPU FAN	Fan connector	PCIE1X1	PCIe x1 slot
DIMM1-2	Memory slots	PCIE1X	PCIe x1 slot
ATX_POWER	24-pin main power connector	PCIE16X	PCIe x16 slot
BATTERY	RTC battery socket	AUDIO	External in/out connectors
SATA0-3	Drive connectors	NIC_USB	Stacked network/USB connectors
F_PANEL	Front I/O connector	USB	Stacked USB connectors
P154	Front I/O connector	ATX_12V	4-pin CPU power connector
P152	Front I/O connector	VGA	Monitor connector
F_AUDIO	Front audio connector		

Diagnostic Beep Codes

The Power-On Self-Test (POST) is a series of diagnostic tests that runs automatically when the computer is powered on. If the POST detects an error, this causes an audible beep code to sound. The POST beep codes are not necessarily accompanied by an associated, visible error code or text message.

The following table shows the POST beep codes, their meanings, and the recommended actions for solving the problem.

Diagnostic Beep Codes

Beeps	Diagnosis	Recommended Action
1 short, 1 long	Bad memory or memory configuration error	Check that the memory modules have been installed correctly and that proper modules are used.
2 short, 1 long	No graphics card installed or graphics card initialization failed.	For systems with a graphics card: 1. Reseat the graphics card. Power on the system. 2. Replace the graphics card. 3. Replace the system board. For systems with integrated graphics, replace the system board.
3 short, 1 long	CPU configuration error or invalid CPU detected before graphics card initialized.	For systems with a graphics card: 1. Reseat the graphics card. Power on the system. 2. Replace the graphics card. 3. Replace the system board. For systems with integrated graphics, replace the system board.
1 short, short pause	No legacy floppy drive or optical drive found	1. Check cable connections. 2. Run the Setup utility and ensure the device port is enabled.
2 short, long sec pause	No floppy diskette or CD found	1. Check the type of drive you are using and use the correct media type. 2. Replace the diskette or CD with a new one.
3 short, long sec pause	Flashing not ready (missing utility or BIOS image file, etc.)	Upgrade the BIOS to proper version.
4 short, long sec pause	Flashing operation has failed (checksum error, corrupted image, etc.)	1. Verify the correct ROM. 2. Flash the ROM if needed. 3. If an expansion board was recently added, remove it to see if the problem remains. 4. Clear CMOS. 5. If the message disappears, there may be a problem with the expansion card. 6. Replace the system board.
5 short, long sec pause	BIOS recovery was successful	No action required.

LED Codes

The following table describes the LED states for the HP 500B, Compaq 500B, and 505B MT Desktop PCs.

LED Codes

LED	State	LED Status
Power LED indicator	System on (normal operation)	Steady green
	Suspend to RAM.	Blinks green every 2 seconds
	Computer off	LED not on
Drive LED indicator	Normal hard drive activity	Green drive LED is flashing

Clearing CMOS

The header allows you to clear the RTC RAM in CMOS.
To erase the RTC RAM:

1. Turn off the computer and any external devices, and disconnect power.
2. Remove the access panel.
3. Remove the RTC battery.
4. Locate the CMOS jumper header on the motherboard. It is labeled E18.
5. Remove the jumper from pins 2-3 pins and put it on pins 1-2 to clear CMOS. Keep the cap on pins 1-2 for 5 to 10 seconds.
6. Replace the jumper on pins 2-3.
7. Reinstall the battery.
8. Replace the access panel, external devices, and reconnect the power cord.
9. Turn on the computer.
10. Hold down the F1 key during boot and enter BIOS setup to re-enter data.

Hewlett-Packard Vision Diagnostics

The Hewlett-Packard Vision Diagnostics utility allows you to view information about the hardware configuration of the computer and perform hardware diagnostic tests on the subsystems of the computer. The utility simplifies the process of effectively identifying, diagnosing, and isolating hardware issues.
Use HP Vision Diagnostics to determine if all the devices installed on the computer are recognized by the system and functioning properly. Running tests is optional but recommended after installing or connecting a new device.
To access HP Vision Diagnostics, you must create a Recovery Disc Set then boot to the CD containing the utility. It can also be downloaded from http://www.hp.com and either burned to CD or installed to a USB flash drive.

1. In Windows Explorer, go to **C:\SWSetup\ISOs** and burn the file **Vision Diagnostics.ISO** to a CD or copy it to a USB flash drive.
2. While the computer is on, insert the CD in the optical drive or USB flash drive in a USB port.
3. Shut down the operating system and turn off the computer.
4. Turn on the computer. The system will boot into HP Vision Diagnostics.
   NOTE: If the system does not boot to the CD in the optical drive or to the USB flash drive, you may need to change the boot order in the Computer Setup (F10) utility.
5. At the boot menu, select either the **HP Vision Diagnostics** utility to test the various hardware components in the computer or the **HP Memory Test** utility to test memory only.
   NOTE: The HP Memory Test is a comprehensive memory diagnostic utility that is run as a stand-alone application, outside of HP Vision Diagnostics.
6. If running **HP Vision Diagnostics**, select the appropriate language and click Continue.
7. In the End User License Agreement page, select **Agree** if you agree with the terms. The HP Vision Diagnostics utility launches with the Survey tab displayed.

Using the Setup Utility

The BIOS Setup Utility is accessed by pressing the F10 button during startup. The BIOS Setup Utility allows you to:

- Change factory default settings
- Set the system date and time
- Set, view, change, or verify the system configuration, including settings for graphics, audio, storage, communications, and input devices
- View processor and memory settings
- Modify the boot order of bootable devices, such as hard drives, diskette drives, optical drives, or USB media
- Run tests on the hard drive
- Establish a supervisor password that controls access to the Setup Utility

Power Button/Power Button LED

The power button is under the BIOS control during POST, in BIOS Setup and after booting to a non-ACPI OS. The BIOS must respond immediately when the power button is pressed in these environments. For the ACPI-compliant OS such as Windows, the BIOS must pass the power button information to the OS via the ACPI table as specified in the ACPI spec.
If a platform offers a dual-color-based power button LED, the BIOS will program the power button LED to alternate the color between the On (ACPI S0) state and the Stand-by (S3) state. In doing so, the LED should not blink, but stay constant. Check with the corresponding platform manager for the default colors in the On and Stand-by states. The color of the power button LED in the Hibernate state (ACPI S4) is the same as in the S5 state.
To find out if the system's power button LED is dual-color capable, check the SMBIOS Type 11 data structure. If the SMBIOS Type 11 data structure contains the string DLED (NOT case-sensitive), the system supports the dual-color power button LED and therefore, the BIOS support as described above is required.

BIOS Updates

HP periodically releases system BIOS updates, which are available from the HP web site. These updates often contain fixes for known issues in the BIOS.
To find out whether a PC needs a BIOS update, compare the current BIOS version number against the latest version available for download. To determine the current BIOS version, you should perform the
following steps:

1. Click **Start > Shut Down**.
2. Select **Restart**, and then click **OK**.
3. When the first screen displays, press **F10** to enter Setup. The BIOS revision number is listed on the main menu.
4. Write down the current BIOS version.
5. Exit Setup by pressing **Esc**, selecting **Yes**, and pressing **Enter**.

POST Error/Warning Messages

Once the display becomes available, the BIOS should classify all errors detected during POST into 3 categories and handle them as specified below:

- Critical errors requiring system shutdown (e.g. CPU fan fault):
  Clear the screen, display the corresponding error message, pause for a while as specified and then turn the system off.
- Serious errors requiring user's attention and response (e.g. SMART error during POST):
  Display the corresponding error message, wait for the user's input and then proceed as selected.
- Alerts/warnings requiring user's attention (e.g. CMOS checksum error -> defaults loading):
  Display the corresponding message and pause for a while as specified. If the message includes an option for a keystroke from the user and the user responds with the key input, proceed as selected. Otherwise, continue the POST process.

When there are multiple errors happened during POST, apply the following guideline:

- If multiple errors include at least one critical error, the system will shut down immediately after handling the first critical error.
- If multiple errors do not include a critical error, handle all serious errors first, one by one, and then proceed to alerts/warnings. For example, if the BIOS detected a SMART error (serious error), a floppy diskette failure (serious error) and a CMOS checksum error (alert/warning) during POST, the BIOS will handle them as follows:

For SKUs including an OS=MSV or an OS=LX in the SMBIOS Type 11 data,

1. Handle the first serious error, SMART error, as follows:
   Display "xxx: Hard disk failure is imminent... Press F10 for Setup, F2 to Continue." If the user selects F10, proceed to Setup. However, if the user selects F2, the BIOS should proceed to step 2 below.
2. Handle the second serious error, floppy diskette failure, as follows:
   Display "Floppy diskette failure... Press F10 for Setup, F2 to Continue." If the user selects F10, proceed to Setup. However, if the user selects F2, the BIOS should proceed to step 3 below.
3. Handle the alert/warning message, CMOS checksum error, as follows:
   Display "Default BIOS settings have been loaded... Press F10 for Setup, F2 to Continue". If the user selects F10, proceed to Setup. However, if the user selects F2, the BIOS should proceed to step 2 below.
   For all other SKUs, use F1 instead of F10 in the above handling.

NOTE: If a device fails to respond while the BIOS tries to configure the device during POST, the BIOS must not make the system look as if it locked up by having an infinite loop or waiting for too long. Instead, the BIOS must time out after a reasonable amount of time (the time varies with the device) and skip to the next process.
NOTE: Unless specified in this document as above, the BIOS should not stop the POST process with any POST diagnostic screen and/or error message to draw user's attention. For example, HP does not consider replacing a hard drive or CPU as an error condition.