White Paper

March 2002
Document # 16DS-0302A-WWEN
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Contents

Intel Pentium Chipset Revision

Evo and Presario Notebook Products

Abstract: Intel has revised several components of Pentium's 830 M_MG Graphics Memory Controller Hub (GMCH) and the 82801 I/O Controller Hub (ICH3). The GMCH stepping advanced from A4 to A6; the ICH stepping advanced from B0 to B1. This is a routine upgrade incorporating various improvements and fixes and occurs normally during the lifetime of complex semiconductor devices. Normally a stepping revision is transparent if it occurs simultaneously with the introduction of a new computer model. In this instance, however, it is occurring in the middle of the lifecycle of several Compaq notebook models (See page four of this document for cut-in dates and serial numbers).

These notebook products, to be produced with a mixture of both the A4 / B0 and A6 / B1 revisions of the chipset, are functionally equivalent and electrically interchangeable.

When are customers impacted?

- System board is replaced during repair. If the replacement board has the 'other' revision of the chipset (different from the original), then the customer may experience the re-enumeration scenario
- Hard Drive Swap: The hard drive is removed from the notebook and then inserted in a different notebook with the 'other' revision of the chipset (different from the original)
- Customer deploys a software image that was created on a system that utilized the older A4 revision of the chipset on a newer edition of the product with the A6 revision.

How are customers impacted?

- The effects are in Windows and may require varying degrees of customer intervention
- Customer software images may be affected depending on how the image was created
- Device drivers that look for specific Device IDs may be affected

Notice

Why is this chipset revision significant?

Intel has revised several components of the Pentium 830 M_MG Graphics Memory Controller Hub (GMCH) and the 82801 I/O Controller Hub (ICH3). The GMCH stepping advanced from A4 to A6; the ICH stepping advanced from B0 to B1. The previous A4 / B0 revision of the chipset will be phased out and replaced in Compaq notebook production starting in March 2002. This revision is a routine occurrence during the lifetime of chipsets on the system board.

Due to this stepping revision, these components are assigned unique new Device IDs[1]. Device IDs can change on a given computer model, even when there is no functional change.

When a Plug and Play operating system[2] is booted, it compares Device IDs it detects against a list retained from the previous boot. If a new Device ID is found, Windows reports that new hardware has been found, may re-enumerate the devices and may prompt the user to reboot. This chipset change is a normal event, and, in most cases, is transparent to the user after the first boot of the system. In the case of the products listed in the "Scope" section on page four of this document, the introduction of the new revision of the chipset came midway in the product lifecycle. For these products, the possibility exists for the re-enumeration scenarios detailed in this document.

Re-enumeration

Re-enumeration is the process where the computer catalogs the ID numbers for all Plug and Play devices in the system and stores that information in a data table. This stored table can be read by the operating system to determine what device drivers (if any) need to be installed to support that device. Upon each subsequent boot of the computer, a comparison is made between what is detected and what is in the current table. When the operating system detects a new device or a different Device ID for an existing device, the system updates the table to reflect the change and uses that information to ensure that the correct device drivers are installed.

[1] Device IDs—An electronic 'signature' defined by the manufacturer identifying each unique type of device that can be attached to a computer. Examples of devices having unique Device IDs include disk drives, mice, keyboards, memory controllers, I/O controllers, and video cards.

[2] Microsoft Windows 98, Windows 2000, Windows Me, or Windows XP

Scope

What notebooks are affected?

The notebooks listed below received the new revision of the chipset. Listed after each notebook are the factory cut-in dates and serial numbers of the new revision of the chipset.

- Evo Notebook N600c (Cut-in: March 6, 2002; S/N 3J23xxxx5xxx)
- Evo Notebook N180 (Cut-in: April TBD)
- Evo Notebook N160 (Cut-in: March 13, 2002; S/N 5Y23xxxxCxxx)
- Presario 2700xx (Cut-in: April TBD)
- Presario 1700xx (Cut-in: March 13, 2002; S/N 5Y23xxxxCxxx)

When are the notebooks affected?

With the notebooks listed above, re-enumeration may occur under the following conditions:

Notebook System Board Replacement

- System board is replaced during repair. Because of the electrical equivalency of the chipsets, the service strategy does not differentiate boards with the two chipsets by different part numbers. Hence, repairs requiring system board replacements may introduce the 'other' chipset (different from the original) to the installed base. If the replacement board has the 'other' revision of the chipset (different from the original), then the customer may experience the re-enumeration scenario.
- Hard Drive Swap: The hard drive is removed from the notebook and then inserted in a different notebook with the 'other' revision of the chipset (different from the original)

Software Image Deployment

- Customer deploys a software image that was created on a system that utilized the older A4 revision of the chipset on a newer edition of the product with the A6.
- *Example: The customer builds an image on an Evo Notebook N600c in December 2001. Notebooks with new A6 revision of the chipset are purchased in April 2002. The customer then deploys the December 2001 software image on the newly purchased notebook and experiences re-enumeration on the first boot.*

Customer experience with re-enumeration

If no action has been taken to prepare Windows to accept a revised system board, Windows may perform a re-enumeration during the first boot after the system board is replaced or during image deployment of a product rollout. This re-enumeration is a normal action that occurs when Windows detects hardware that was not present at the previous boot of the system.

The following table describes the expected behavior of various platforms after a Compaq standard pre-installed factory image that was created on a system that utilized one revision of the chipset is deployed to a product with a different revision. All Compaq standard images pre-installed at the factory after the cut-in dates listed on page four of this document are compatible with the new A6 revision of the chipset. However, if the customer using the Compaq standard image (built prior to the cut-in dates) meets the listed conditions, re-enumeration will occur.

Note*:* In most cases, Windows will re-enumerate its devices. During enumeration, Windows may prompt for one or more user inputs, which are described in the following table. After re-enumeration is complete, reboot Windows. In some cases, the user's preferred video resolution will no longer be set. Always check the video resolution as a last step when this re-enumeration occurs. NIC and Modem devices may be shown in Device Manager with a "#2" behind their description. This change in resolution is a result of the chipset stepping change, and there are no system functionality problems related to this occurrence.

Table 1. Re-enumeration Scenarios

Product	Standard Pre-Installed OS	Change Chipset Rev From:	Change Chipset Rev To:	Customer Experience	Resolution
Evo Notebook N600c	Windows 2000	A4	A6	System will re-enumerate devices. During this time the video resolution will be 640x480. System will then prompt for reboot.	Reboot the system when prompted.
		A6	A4	System will re-enumerate and prompt for a reboot.	Reboot the system when prompted.
	Windows 98	A4	A6	System will re-enumerate devices. System will request user intervention for Intel 82830 Processor to I/O Controller - 3575. After re-enumeration is complete, the Primary and/or Secondary Intel ICH-3-m Controller may be yellow-banged in device manager.	At user prompt for Intel 82830 device, click NEXT through four screens, and then click FINISH. After re-enumeration is complete, Multibay device driver should be reinstalled via SP19870. (This is true whether or not the Multibay driver was previously installed.) Softpaq 19870 available at: http://www.compaq.com/support/files/allsp.html
		A6	A4	System will re-enumerate devices. System will request user intervention for Intel 82830 Processor to I/O Controller - 3575 and for the Intel PRO/100 VM Network Connection. After re-enumeration is complete, the Primary and/or Secondary Intel ICH-3-m Controller may be yellow-banged in device manager.	At user prompt for Intel 82830 device, click NEXT through four screens, and then click FINISH. Repeat this process at the user prompt for the Intel PRO/100 NIC. After re-enumeration is complete, Multibay device driver should be reinstalled via SP19870. (This is true whether or not the Multibay driver was previously installed.) Softpaq 19870 available at: http://www.compaq.com/support/files/allsp.html
	Windows XP – Pro	A4	A6	System will re-enumerate devices. During this time the video resolution will be 640x480. After re-enumeration, video resolution may not be at the original user settings.	Reboot the system after re-enumeration is complete. Manually check video resolution settings and adjust as desired.
		A6	A4	System will re-enumerate devices.	Reboot the system after enumeration is complete.
	Windows NT	A4	A6	System will boot normally.	None required
		A6	A4	System will boot normally.	None required

Product	Standard Pre-Installed OS	Change Chipset Rev. From:	Change Chipset Rev. To:	Customer Experience	Resolution
Evo Notebook N180 **Presario 2700**	Windows 2000	A4	A6	System will report, "The file EAPS2KBD.SYS on Easy Access Internet Keyboard is needed." System will report, "The file ATI2MTAG.SYS on ATI Technology Inc. Installation Disk (Video) is needed." After re-enumeration is complete, the Scroll Button on the Keyboard will not function.	See instructions in "Installing EAPS2KBD.SYS." See instructions in "System Needs ATI2MTAG.SYS." See "Restoring Scroll Button Functionality."
		A6	A4	System will re-enumerate devices.	Reboot the system after enumeration is complete.
	Windows XP – Pro	A4	A6	System will re-enumerate devices. After re-enumeration is complete, the Scroll Button on the keyboard will not function, and the video resolution may not be at the original user setting.	Manually check video resolution for desired settings. To restore scroll button functionality, see instructions in "Restoring Scroll Button Functionality."
		A6	A4	System will re-enumerate devices.	Reboot the system after enumeration is complete.
	Windows XP – Home	A4	A6	System will re-enumerate devices.	Reboot the system after enumeration is complete.
		A6	A4	System will re-enumerate devices.	Reboot the system after enumeration is complete.
Presario 1700	Windows 2000	A4	A6	System will re-enumerate devices. During this time, the video resolution will be 640x480. System will report, "The file EAPS2KBD.SYS on Easy Access Internet Keyboard is needed." System will report, "The file ATI2MTAG.SYS on ATI Technology Inc. Installation Disk (Video) is needed." System will prompt to reboot the unit. Afterwards, the Scroll Button on the Keyboard will not function. Video resolution may not be at the desired user settings.	See instructions in "Installing EAPS2KBD.SYS." See instructions in "System Needs ATI2MTAG.SYS." Reboot unit and see instructions in "Restoring Scroll Button Functionality." Video resolution should be manually checked to ensure desired settings.
		A6	A4	System will re-enumerate devices and will prompt for a reboot.	Reboot the system after enumeration is complete.
	Windows XP - Home	A4	A6	System will re-enumerate devices and will prompt for a reboot.	Reboot the system after enumeration is complete.
		A6	A4	System re-enumerated all devices.	Reboot the system after enumeration is complete.
Evo Notebook N160	Windows 2000	A4	A6	System will re-enumerate devices. During this time, the video resolution will be 640x480. After re-enumeration is complete, Scroll Button on Keyboard will not function.	After re-enumeration, see instructions in "Restoring Scroll Button Functionality."
		A6	A4	System will re-enumerate devices.	Reboot the system after enumeration is complete.

Product	Standard Pre-Installed OS	Change Chipset Rev. From:	Change Chipset Rev. To:	Customer Experience	Resolution
Evo Notebook N160	Windows 98	A4	A6	System will re-enumerate devices. System will request user intervention for Intel 82830 Processor to I/O Controller - 3575 and for the Intel PRO/100 VM Network Connection.	At user prompt for Intel 82830 device, click NEXT through four screens, and then click FINISH. User will be prompted to reboot. Repeat this process at the user prompt for the Intel PRO/100 NIC.
		A6	A4	System will re-enumerate devices.	Reboot the system after enumeration is complete.

Installing EAPS2KBD.SYS

1. Type in the following paths for the requested files:
   - EAPS2KDB.SYS -> C:\WINNT\SYSTEM32\DRIVERS
   - FLTRCOI.DLL -> C:\WINNT\SYSTEM32
2. Click FINISH at the Installation Complete screen, and Click YES to reboot the system.

   Alternatively, reinstall EAK from the Application/Driver Restore CD.

Installing ATI2MTAG.SYS

Type in the following paths for the requested files:

- ATI2MTAG.SYS -> C:\WINNT\SYSTEM32\DRIVERS
- ATI2DVAG.DLL -> C:\WINNT\SYSTEM32

Alternatively, reinstall the video driver from the Application/Driver Restore CD

Restoring Scroll Button Functionality

1. To re-enable the scroll button, perform the following steps:
   a. Open the Mouse Applet in Control Panel, click the Hardware Tab, and click the Properties Button.
   b. Click on the Driver Tab and click the Update Driver Button.
   c. Click NEXT.
   d. Click the radio button for "Display a list of known drivers..." and click NEXT.
   e. Select "Synaptics PS/2 Port Touchpad" and click NEXT twice.
2. If prompted, type in the following paths for the requested files:
   - SYNTP.SYS -> C:\WINNT\SYSTEM32\DRIVERS
   - SYNTPAPI.DLL -> C:\WINNT\SYSTEM32
   - SYNTPLPR.EXE -> C:\PROGRAM FILES\SYNAPTICS\SYNTP
   - SYNTPCOL.DLL -> C:\WINNT\SYSTEM32
3. Click Finish when prompted, and click YES to reboot the system.

   Alternatively, reinstall Easy Access Internet Keyboard from the Application/Driver Restore CD.

Solutions for Business Customers

Note: To complete the actions detailed in this document, you must be familiar with image development tools (such as SYSPREP). The information in this section is important to IT organizations that

- purchase specific Compaq notebooks (Evo Notebook N600c, Evo Notebook N180, Evo Notebook N160, Presario 2700xx, and Presario 1700xx) and
- currently deploy a software image that was created on a system that utilized the older A4 revision of the chipset

Customers that meet these two conditions may need to update their software image to prevent re-enumeration on future product rollouts and notebooks that have the system board replaced.

Proactive Solutions - Creating and Deploying a Software Image for both chipset revisions

Order Evaluation Notebooks

Customers will require notebooks with both revisions of the chipset for image testing and development. For the customer who has not yet purchased product with the new chipset (see serial number cut-in on page four), evaluation units are available in each region. To order a sample unit, contact your Compaq account representative.

Image Adjustment Recommendations

The image changes should take no more than 2-3 hours and should not require re-certification of the image. (Please refer to the "Why Image Re-certification is not Necessary" section on page nine of this document) If customized Windows images are built for local deployment, complete an image "conditioning" for future deployment of mixed populations of system boards that have either the A4 or A6 edition of Intel chipsets. Conditioning will prevent manual intervention for future service events. For information about image building and running SYSPREP, refer to the appropriate Microsoft documentation.

1. Run SYSPREP against the existing image that was built or conditioned on either the A4/B0 or A6/B1 system board. Along with other operations, a plug-and-play enumeration will be performed, and the appropriate descriptors will be placed in the Windows registry for this edition of the system board. Complete a clean install of the existing image.
2. Move the HDD produced in the previous step to a unit containing the other version of the system board, or swap the system board itself to the other version of the system board.
3. If the system prompts the user to reboot during the re-enumeration process, choose "No" until re-enumeration is complete. Once re-enumeration is complete, reboot the system. This will prevent unnecessary repeated reboots of the system that prolong the process.
4. Run SYSPREP again on the image produced in Step 3. Another enumeration will then be performed, and the appropriate descriptors will be placed in the Windows registry for the new edition of the system board. This image is the image that will be used for deployment.

Note: If customers are using the Evo Notebook N600c with Windows 98 and require hot-swapping functionality of the Multibay for optical drives, a new MultiBay driver (SoftPaq 19870) can be downloaded at: http://www.compaq.com/support/files/allsp.html.

Why Image Re-certification is not Necessary

By following the instructions listed above, the image transition from the A4 to the A6 chipset will not change any executable software code. Changes are limited to static table entries and linkages/pointers. This is evident in the fact that NT, a non Plug-N-Play OS, is completely oblivious to the chipset change. Once the transition is complete, the end result is an operating system image that is now supported across both the Intel A4 and A6 chipsets. For custom-built images tailored to specific customer environments, the core process remains the same.

Depending on which Microsoft operating system is being used, there are no new software code changes induced into the image. The only exception is the Windows 98 operating system on the Evo Notebook N600c. The Windows 98 OS on the Evo Notebook N600c requires a new MultiBay Plug-N-Play Manager version 4.00D SP19870 to support hot swap capability. If hot swap capability is not a required feature by the end user, then there is no need to induce a code change at all with Windows 98.

Compaq does NOT see a requirement for IT organizations to send a transitioned A4 to A6 image back through a new certification process. The transition to the new chipset does not introduce any functional changes (i.e. changes to executable software codes) to the operating systems. The distinguishing difference between the chipset revisions as seen by the operating system is the new Device IDs. The new Device IDs are implemented to identify the new components, and the functionality remains the same. It is important to note that the software enumeration that occurs utilizes the identical driver set that was used to configure the original Device IDs. Changes are limited to new registry keys written to align the new Device IDs with the original driver set for proper configuration.

Recommended Image Deployment Strategy

Compaq highly recommends the following strategy when deploying a new image that is compatible with both the A4 and A6 revisions of the chipset:

Primary Objectives

- Prevent costly mid-cycle image deployment to the entire installed base of affected notebooks
- Prevent all end-users from experiencing the re-enumeration scenarios

Image Deployment

- **New Products**: Limit the deployment of the new image to new product rollouts.
- **Existing Installed Base of Products**: Do not deploy the image on the existing installed base of notebooks until you are ready for your next major image deployment. The notebooks manufactured prior to the cut-in dates listed on page four are only affected if they experience a service event that requires a system board replacement. Please refer to the “Notebook Repair” section on page ten for further details on repair activities.
- **Subsequent Image Deployment**: At your next major image deployment to the entire installed base, ensure that the image is compatible with both the A4 and A6 revision of the chipset by following the guidelines in the “Image Adjustment Recommendations” section on page 9 of this document..

- **PCCS Customers**: Software images for customers that currently subscribe to Image Design and Image Modification services with Compaq's PC Custom Solutions have been updated, when necessary, to account for the new A6 revision of the chipset. This image will be deployed on all new product rollouts. The current installed base of notebooks will be re-imaged when required by the customer. Customers who do not subscribe to Image Design and Image Modification services should contact their account managers if they wish to have Compaq update their images to accommodate the A6 change.

Notebook Repair

Because of the electrical equivalency of the chipsets, the service strategy does not differentiate boards with the two chipsets by different part numbers. Hence, repairs requiring system board replacements may introduce the 'other' chipset (different from the original) to the installed base.

- We recommend that the service provider manually assist the re-enumeration process before it reaches the end user (see Re-enumeration – Manual of Assisted Intervention on page 11). If the hard drive is present in the notebook, all Authorized Service Providers have been instructed to complete the re-enumeration process before the notebook reaches the end user. This intervention will result in an image that is equivalent to the new image built for both chipsets.
- This strategy is only necessary until the next major image deployment on all notebooks in the installed base. Once a new image that is compatible with both chipsets is deployed to all notebooks, the re-enumeration scenarios will no longer be an issue after system board repairs.
- **Customers using Compaq's Standard Pre-installed Factory Image**: An application has been developed to assist with the re-enumeration process on the Compaq standard pre-installed factory image by loading necessary drivers and making the appropriate changes to settings. The "System Board Software Adjustment" application can be downloaded as Softpaq 20816 located at http://www.compaq.com/support/files/allsp.html. This application will also be shipped on a CD with each system board repair spares kit to assist the service technician if the re-enumeration process occurs. If the hard drive is not present in the notebook, the service technician has been instructed to pass the instructions and CD to the end user for the re-enumeration to occur at the customer site.

Reactive Solutions

Re-enumeration Guidelines

If no action has been taken to prepare Windows to accept a revised system board, Windows may perform a re-enumeration during the first boot after the system board is replaced or during image deployment of a product rollout. This re-enumeration is a normal action that occurs when Windows detects hardware that was not present at the previous boot of the system.

Re-enumeration – Assisted Intervention

An application has been developed to assist with the re-enumeration process on notebooks with the Compaq standard pre-installed factory image by loading necessary drivers and making the appropriate changes to settings. The "System Board Software Adjustment" application can be downloaded as Softpaq 20816 located at http://www.compaq.com/support/files/allsp.html. This application will also be shipped on a CD with each system board spares kit to assist the service technician if the re-enumeration process occurs.

Re-enumeration – Manual Intervention

During re-enumeration, Windows may ask questions regarding Intel devices such as the graphics and memory controller or the I/O controller. Click "Yes" to all dialog boxes. Also during re-enumeration, a question may be asked about a .DLL or .SYS file. When Windows prompts for these files, the user should conduct a search for the file, identify the path, and plug the path name into the request for the given file. With the Compaq standard pre-installed factory image, the DLL files are located in the Windows\System32 directory, and .SYS files are located in the Windows\System32\Drivers directory. Type the file name in the dialog box or select the "Browse" button to search for the file, then click OK.

If Windows finds the selected file name, it will continue the re-enumeration process. If Windows does not find the name, a dialog box similar to the first box will be displayed. Click "Cancel." Windows will then proceed without having found the file and will disable the Intel device until you reinstall the driver file to restore the functionality of the affected device. Finally, reboot the system to complete initialization of the hardware. If you have questions regarding this procedure, contact the Help desk at your organization.

After the system has rebooted, complete the following verifications of the system:

- If Windows asked for a device driver or system file during enumeration and it was not found, the device has not been properly restored. Check the Device Manager for "Yellow Bangs," question marks, or other indications that the device is not properly configured. Obtain a SoftPaq from www.Compaq.com to install the appropriate device driver, or find the proper installation files on www.Microsoft.com. Complete the necessary downloads or installations until the Device Manager indicates that all devices are properly configured and operational. If you have questions regarding this procedure, contact the Help desk at your organization.
- If the display settings were modified during the re-enumeration process, reset the video display by clicking **Control Panel > Display Settings.** If you have questions regarding this procedure, contact the Help desk at your organization.
- Before making any other adjustments to the settings, reboot the system. If the boot operation is completed without messages or warnings of abnormal conditions, the system is ready to perform work.

Service Solutions

Because of the electrical equivalency of the chipsets, the service strategy does not differentiate boards with the two chipsets by different part numbers. Hence, repairs requiring system board replacements may introduce the 'other' chipset (different from the original) to the installed base.

- The Authorized Service Providers and Repair Depots will receive the procedures to shield the end-user from experiencing the re-enumeration scenarios. Each applicable system board service kit will contain documentation instructing the service technician to power on the unit after the system board replacement to allow re-enumeration to occur. It will also include a CD with drivers to assist during the re-enumeration process if the customer's notebook has the Compaq standard pre-installed factory image. The documentation and CD will assist the service technician in going through the re-enumeration process on behalf of the end user if the end-user's Hard Drive is in the unit. In the event that the service technician is unsuccessful in guiding the re-enumeration process, Compaq Technical Support is prepared to provide support. For additional instructions on dealing with re-enumeration, please refer to the "Re-enumeration Guidelines – Manual Intervention" section on page eight of this document.

- The “System Board Software Adjustment” application can be downloaded as Softpaq 20816 located at http://www.compaq.com/support/files/allsp.html. This application will also be shipped on a CD with each system board spares kit to assist the service technician if the re-enumeration process occurs.
- If the IT organization of your accounts requires stricter control over the software image based on the SLA, the ASP may not proceed with guiding the re-enumeration process.

Solutions for Home & Home Office Customers

Service Solutions

Because of the electrical equivalency of the chipsets, the service strategy does not differentiate boards with the two chipsets by different part numbers. Hence, repairs requiring system board replacements may introduce the 'other' chipset (different from the original) to the installed base.

- The Authorized Service Providers and Repair Depots will receive the procedures to shield the end-user from experiencing the re-enumeration scenarios. Each applicable system board service kit will contain documentation instructing the service technician to power on the unit after the system board replacement to allow re-enumeration to occur. It will also include a CD with drivers to assist during the re-enumeration process if the customer's notebook has the Compaq standard pre-installed factory image. The documentation and CD will assist the service technician in going through the re-enumeration process on behalf of the end user if the end-user's Hard Drive is in the unit. In the event that the service technician is unsuccessful in guiding the re-enumeration process, Compaq Technical Support is prepared to provide support. For additional instructions on dealing with re-enumeration, please refer to the "Re-enumeration Guidelines – Manual Intervention" section on page eight of this document.
- The "System Board Software Adjustment" application can be downloaded as Softpaq 20816 located at http://www.compaq.com/support/files/allsp.html. This application will also be shipped on a CD with each system board repair spares kit to assist the service technician if the re-enumeration process occurs.
- If the hard drive is not present in the notebook at the time of service, the end user can contact Compaq technical support for assistance with the re-enumeration process.