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FROM: Intel Customer Support-Support Engineering

SUBJECT: 4A4LL0X0.86A Production Release 14.0

About This Release

- 4A4LL0X0.86A.0031.P14

Features/Errata Fixed In This Release

P14-0031

- Fixed issue with LDCM/NVRAM corruption.
- Fixed issue with USB speaker not working with USB legacy disabled.
- Fixed issue with S3 Savage4 AGP video card when AGP aperture = 256MB.
- Fixed issue with POST delay when powered USB hub attached.
- Fixed issue with user flash hang at video initialization.
- Fixed issue with small logo not visible during POST.
- Fixed issue with security holes in BIOS Setup.
- Fixed DMI memory capacity information.
- Removed L2 ECC support option when Celeron™ processor is installed.
- Added new processor updates for Celeron™ processor with 128KB L2 cache.
- Added support for 433 MHz Celeron™ processors.

P13-0030

- Fixed issue where CK3D Spread Spectrum clocking mode is not enabled for Intel® Celeron™ processors.
- Fixed issue where [Ctrl]-[Alt]-L does not function as a hotkey under Windows.
- Removed support for security hot key [Ctrl]-[Alt]-L.

P12-0029

- Fixed issue where on-board audio is not being enabled when ENABLED in SETUP.

P11-0028

- Fixed foreign language text which extended beyond the borders in Setup.
- Fixed wrap around problem with Spanish and Italian AGP help strings.
- Added support for updating the ACPI FACP OEM Revision field based on BIOS build date.
- Added fix for IBUAPI hanging on reads when HIMEM.SYS is not loaded.
- Fixed SMBIOS 2.1 code to terminate all structures with two null characters.
- Fixed the issue where changing the chassis type using MFGDMI or OEMDMI would result in the boot status byte being changed instead. This was specific to DMI table structures.
- Fixed a issue with SMBIOS where the BIOS would hang at POST code BAh.

P10-0027

- Added support for Celeron™ processors 300A and 333 MHz.
- Fixed issue where "Unattended Start" was not functioning correctly.
- Added support for 16 color full-screen POST logo.
- Added ACPI support to bios.
- Added "Boot Time Diagnostic Screen" option to the SETUP BOOT menu.
- Added "QuickBoot Mode" option to the SETUP BOOT menu.

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- Fixed issue where the Inactivity Timer was accessible when the User Security Level was "View Only" or "Limited Access".
- Added "Memory Size Decreased" error logging to the BIOS
- Fixed the issue where setting incorrect timing for memory could cause performance degradation.
- Fixed issue where system could wake up from SUSPEND when Resume on Ring is DISABLED in Power Management.
- Fixed issue where a transition to ACPI mode could cause RTC alarms to be set incorrectly.
- Suppress display of password hash in "System Disabled" popup.
- Added support for "Memory Decreased" error logging in SMBIOS 2.1
- Added support for multiple video card boot options.

P09-0024
- Fixed an issue with "Unattended Start".
- Resolved an issue where APM cannot be disabled in Windows* 95, even if APM is disabled in the BIOS.
- Fixed an issue with the Wake-on-LAN™ feature.
- Resolved an issue where certain SCSI adapters will fail during Windows NT* 4.0 SETUP.
- Fixed an issue with IrDA support.
- Fixed the issue where a phone ring will always wake up the system, regardless of the "On Modem Ring" setting in BIOS Setup.

P08-0023
- Added support for Intel® Celeron™ processors in POST, SETUP, and DMI.
- Fixed issue where Intel BIOS Update utility would not display OEM logo file.
- Added support for PIIX4E.
- Changed After "Power Failure" default to 'Last State'.

P07-0019
- Fixed the issue of the system hanging after the IDE peripheral configuration was altered.
- Restored USB feature which was corrupted in release P06-0017.
- Fixed issue of L2 ECC not being disabled for certain speeds when the cache entry was set to DISABLED in the Setup utility.
- Added ability to display logo that was flashed into the User Block.
- Enabled EPP parallel port to be recognized by Windows* 95.
- Removed "Memhole" Setup option from the Advanced Menu, Resource Configuration Submenu.
- Changed default for "Plug & Play O/S" Setup option to 'No'.
- Fixed wrap around problem with Spanish and Italian help strings for the "AGP Aperture Size" Setup option.
- Fixed Resume on Ring feature.
- Fixed SUSPEND in 1999, resume in 2000 issue.
- Update to DMI Type 4 Processor information: Maximum speed is now reported as 333MHz.
- Re-implemented support for spinning down power supply and chassis fans at fan headers in a power managed state.
- Restored fan operation during recovery.
- Added spread spectrum capable clock detection by checking for an entry in the FLASH DMI area.

P06-0017 (The BIOS changed to a new "core" base after BIOS release P05-0015. All Features/Errata mentioned in this section apply to modifications made after the base change.)
- Added dynamic memory and clock detection.
- Resolved backward-compatibility issue with single-sided 100MHz DIMMs.
- Fixed Scan User Flash help text.
- Updated to support USB HID Specification 1.00 Release, now uses the interface instead of the endpoint for keyboard addressing.
- Keyboard LEDs now flash when the Password Security is enabled.
- Improved the reliability of hot plugging and unplugging USB devices.
- Fixed the spurious SMI that came with every USB I/O SMI.

- Restructured the Callback or Persistence mechanism for USB keyboard support so if no Persistence was required, the next byte of Data would be put into the Keyboard Controller.
- When USB Devices are attached and there are no other Devices of that type in the System, the Device code will issue a successful power-on BAT.
- Added capability for Dual 16-character Password support in the USB Device Emulation code. Any System with USB Legacy support enabled can have Dual 16-character support without changing the Keyboard Controller.
- Added support for HotKey invoked Password Security "Quicklock" in the USB Device Emulation.
- The Length of USB Data Persistence defaults are: 2ms (Data Persistence) and 256ms (Response Delay).
- Fixes an issue where emulation code, during a USB extended Key sequence, would stop because an Extended Scancode was pressed.
- To mimic USB functionality, PS/2 Devices are polled every second to see if they are still attached.
- Added support that allows Password Security to work properly. This was done by updating and checking the Keyboard Controller Status bit 4 (uninhibited).
- Created support to fully emulate the Keyboard Controller so the System will not be able to tell the difference.
- The USB keyboard translation table was extended to include some of the keys used in 109-key Kanji keyboards. The USB HID Spec version 1.0 never listed Kanji keys 87h-8Fh as available on bootable state of the USB keyboard.
- Some USB keyboards give a whole Packet of Errors, which does not contain any Key information. This fix throws this Error Packet out.
- Fixed issue with the Keyboard Auto-Repeat code. When multiple keys transited close together, one of the Keys would very quickly repeat when it should not have.
- Since some USB keyboards do not correctly handle the Set-Idle Command, the Keyboard module has been re-architected to use eight separate Host Controller Callback Interrupts.
- Restructured the Callback mechanism so that the Mouse data has no Persistence. Single Mouse clicks would not be correctly reported.
- Improved reliability of plugging and unplugging of USB devices.
- Reset the static queue entry after a blocking transfer.
- Added Extended Memory Test Abort feature during POST.
- Fixed hang at POST code 52h when a key is stuck.
- Added the new BIOS update for Pentium® II C-1 processors.
- Added L2 ECC support.
- Enabled Year 2000 rollover handling even with QuickBoot active.
- Fix/added dynamic ECP support.
- Added devnode to reflect shadow memory not used by an Option ROM and not returned to the ISA bus.
- Added code to reclaim unused shadow space and return the UMB blocks to the ISA bus.
- The 'ISA Enable' bit should not be set for the 440LX AGP PPB. Added code to reset the bit.
- Fixed issue where User binaries were not being executed correctly.
- Added INT15h 2307h interface. This allows a programmatic way for applications to determine WakeUp/PowerUp status of the system. See "Landesk Service Agent BIOS Support White Paper Revision 1.0" for details.
- Enabled PS/2 mouse to work while plugged into a specific 109-key Kanji keyboard.
- Corrected programming of Memory Buffer Strength Control Register (MBSCR).
- Corrected ECC event logging for single-bit and multi-bit errors. Symptom was that the BIOS would lock up if a single-bit or multi-bit ECC error occurred and logging of ECC errors is ENABLED in BIOS using Setup's "Advanced DMI Event Logging Screen's ECC Event Logging field.
- Added DMI handler for AGP slot.
- Fixed spurious hang at Checkpoint 9Ch during POST.
- Changed to prevent enabling of Intel 82440LX PCI-to-PCI Bridge Control Register ISA Enable Bit (Register 3Eh Bit 2).
- Fixed TV card failure in Windows* 95 when PnP O/S = YES.
- Freed IRQ12 for other uses if mouse not present.

- Fixed potential system hang issue if a PCI Option ROM > 64 KB was shadowed.
- Fixed an issue where a Windows protection fault would occur during runtime services.
- Correctly reported the shadow memory size for systems with UMA feature.
- Added "Memory Size Decrease" error message.
- Added support for PnP ANSI ID string.
- Now IRQs reserved in Setup are not allocated by Windows* 95 to PCI devices.
- PCI devices are now always guaranteed at least one IRQ when Windows* 95 OSR2 configures the system.
- Fixed issue where system would save new configuration data on every boot if a PCI card asked for both prefetchable and non-prefetchable memory of the same size.
- The BIOS now filters invalid memory or I/O requests for PCI devices.
- Fix to make <Page Up>/<Page Down> scroll a page at a time rather than mimic the <Home>/<End> keys.
- Displays the hard disk total sector count and drive size based on the hard disk total sector count.
- Displays a "CHS Format", "LBA Format" strings for all installed hard disks.
- Added a general method to clear system passwords from Setup. Previously, the password was cleared on a case by case basis.
- Added support for Setup user access features.
- Fixed issue causing garbage characters to be displayed in the removable devices menu.
- Does not support USB Legacy.
- Fixed a issue which caused multiboot menu corruption.
- Fixes a Setup issue that was incorrectly displaying cylinders, heads and sectors per track parameters for CD-ROM drives.
- Corrected several issues with user security access and added optional line items for the administrator to clear a user password or disable user access from Setup. Also enhanced the Setup Utility to be more consistent when displaying non-selectable items. Now the title string remains blue while the informative string becomes gray.
- Enables setting Prefetch and Posting enable for all hard disks.
- Disables setting Prefetch and Posting enable for all non-hard disk drives.
- Provides support for setting the DMA capable bits for ATA and ATAPI devices.
- Provides support for setting up FPIO and FDMA transfer modes for ATA and ATAPI devices.
- Fixed issue that was causing FPIO mode 3, DMA mode 1 drives to be setup with FPIO mode 4.
- Corrects issues where drives are not auto-typed on a cold Boot.
- Corrects issue that causes only one hard disk to be power managed.
- Fixed issue of UDMA being enabled for non-UDMA capable ATAPI drives.
- Corrected issue of an Iomega IDE ZIP* drive not booting as a removable disk.
- Fixes an issue that was causing the system to hang when no hard disks were installed and the motherboard didn't have a pull-down resistor on DA7.
- Fixes an issue that was causing some slave devices to not be auto-typed during POST.
- Made change to allow the BIOS to pass non standard INT 13h function calls through to other handlers.
- Fixes an issue that was causing SCSI drives to not install correctly during POST.
- Fixes an issue that was causing Boot Block Specification (BBS) aware option ROM's to not be configured.
- Fixed issue of a long delay when a soft reset is issued to the fixed disk controller.
- Fixes an issue that was causing invalid parameters to be returned to Windows* 95/OSR2.
- Allows the ability to set the FPIO, FDMA and UDMA settings for all IRM drives. Provides the ability to have the DMA capable bits set for all IRM drives.
- Fixed an issue with auto-typing on the primary master, which has been forcing all other drives to auto-type or not.
- Corrects possible DOS system hang when a DMA read or write is performed. Also allows standard reads and writes to occur if a DMA transfer fails.
- Fixes a Setup issue that was not be displaying the model type string for ATAPI devices.
- Fixes an issue causing failures in the Windows NT* PC97 HCT IDE Test.
- Fixed issue with 3-Mode driver 1024fd.exe inability to install if no media is inserted in drive.
- Fixes a issue that was causing the system to hang after re-booting out of Windows NT* 4.0.

- Made change to allow the BIOS to pass the number of the boot device to the boot strap loader.
- Fixed a system hang when boot priority is Network first followed by CD-ROM.
- Global system timers are now started when APM is connected. They are stopped when APM is disconnected.
- Added feature to disable HDD timer programming.
- Added support for APM global standby state and resume on-time from global standby state.
- Added support to check device power management mode in Setup during global system transition. If the device PM mode is disabled, don't power manage the device.
- APM function call restore power-on defaults, sets the current system state to enabled from the previous functionality.
- Changed APM function Set Power State to global standby state, to check system capability for standby state.
- Increased PIIX4 SMI checking performance.
- Fixed the issue that when HDD pm is disabled in Setup, hard disks are still powered down.
- Fixed the issue that when more than one fixed drives are installed, the fixed drives cannot be APM power managed correctly.
- Fixed the issue that the system will hang during DMA transfer if a system reset is issued or HDD power state is changed.
- Now does not post standby resume notification to APM driver when suspend timer times out.
- Add new code for Resume On Time.
- Now continue to resume from suspend, even if RTC alarm was not set by BIOS.
- Fixed serial mouse issue after resuming from suspend.
- Added serial port device monitoring.

P05-0015
- Added support for Disk drives larger than 8.4 Gigabytes.
- Added new hard disk detection code.
- Added hard disk pre-delay to Setup.
- Added L2 ECC enable/disable to Setup.
- Added AGP aperture menu to Setup.

P04-0014
- Added code to disable onboard audio if an add-in audio board containing a Yamaha OPL3 component is detected.
- Fixed issue of DOS format command not being able to format 1.44 unformatted media in a LS-120 drive when the system was restarted in DOS mode.
- Fixed issue of cache remaining enabled when the cache Setup option has been set to Disabled.
- Added feature that allows CMOS and/or ESCD to be cleared on the next boot.
- DMI related text strings in the Setup utility are now available for supported languages.

P03-0013
- Fixed issue where the BIOS attempted to do Yamaha audio initialization even if the motherboard did not have onboard audio. Yamaha based add-in audio cards will now work in motherboards that do not have onboard audio.
- Fixed issue with LS-120 drives in Windows* 95. Two LS-120 drives were reported after coming out of a DOS session, when only one was present.
- Added code to allow some AGP cards to function properly.
- Added BIOS support for C-1 stepping of the Pentium® II microprocessor.

P02-0012
- Added code to handle Yamaha OPL3-SA3 Sound Blaster* software reset and OPL4-ML double hardware reset.
- Fixed issue of configuration mode running slowly.
- Fixed Mfg Mode update issue: CMOS cache info is now read after MFG defaults are loaded.

P01-0011

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- Has support for Bus Mastering IDE on ATA devices.
- Has support for LS-120 device, including Boot Block support
- Has USB Legacy support.
- Has Year 2000 support.
- Has support for Quick Boot.
- Has support for IDE Removable Media.
- Has support for Wake-On-Lan for Fab B and later AL440LX boards.
- Has support for 233 MHz, 266 MHz and 300 MHz processors in Setup.