



MU440EX Motherboard Specification Update

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Order Number: 704527-012

The MU440EX motherboard may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are documented in this Specification Update.

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The MU440EX motherboard may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

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REVISION HISTORY

Date of Revision	Version	Description
May 1998	-001	This document is the first Specification Update for the Intel® MU440EX motherboard.
June 1998	-002	Added Documentation Change 1.
August 1998	-003	Added Specification Change 1, Errata 3-4 and Documentation Changes 2-3.
September 1998	-004	Added Specification Change 2.
October 1998	-005	Updated status of Erratum 1. Added Specification Change 3.
November 1998	-006	Updated status of Erratum 4. Added Errata 5-7.
December 1998	-007	Added Errata 8-10.
January 1999	-008	Modified Erratum 10. Added Errata 11-13.
February 1999	-009	Modified Specification Change 3.
March 1999	-010	Added Documentation Change 4.
May 1999	-011	Added Erratum 14.
June 1999	-012	Added Erratum 15.

PREFACE

This document is an update to the specifications contained in the MU440EX Motherboard Technical Product Specification (Order number 701003). It is intended for hardware system manufacturers and software developers of applications, operating systems, or tools. It will contain Specification Changes, Errata, Specification Clarifications, and Documentation Changes.

Refer to the *Pentium® II Processor Specification Update* (Order number 243337) for specification updates concerning the Pentium II processor. Items contained in the *Pentium II Processor Specification Update* that either do not apply to the MU440EX motherboard or have been worked around are noted in this document. Otherwise, it should be assumed that any processor errata for a given stepping are applicable to the PBA revision(s) associated with that stepping.

Refer to the *82443EX Specification Update* (Order Number TBD) for specification updates concerning the 82443EX PCI A.G.P. Controller. Items contained in the *82443EX Specification Update* that either do not apply to the MU440EX motherboard or have been worked around are noted in this document. Otherwise, it should be assumed that any controller errata for a given stepping are applicable to the PBA revision(s) associated with that stepping.

Refer to the *Intel® 82371EB (PIIX4E) Specification Update* (Order Number 290635) for specification updates concerning the 82371EB PIIX4E. Items contained in the *Intel 82371EB (PIIX4E) Specification Update* that either do not apply to the MU440EX motherboard or have been worked around are noted in this document. Otherwise, it should be assumed that any PIIX4E errata for a given stepping are applicable to the Printed Board Assembly (PBA) revision(s) associated with that stepping.

Nomenclature

Specification Changes are modifications to the current published specifications. These changes will be incorporated in the next release of the specifications.

Errata are design defects or errors. Characterized errata may cause the MU440EX motherboard's behavior to deviate from published specifications. Hardware and software designed to be used with any given Printed Board Assembly (PBA) and BIOS revision level must assume that all errata documented for that PBA and BIOS revision level are present on all motherboards.

Specification Clarifications describe a specification in greater detail or further highlight a specification's impact to a complex design situation. These clarifications will be incorporated in the next release of the specifications.

Documentation Changes include typos, errors, or omissions from the current published specifications. These changes will be incorporated in the next release of the specifications.

Specification Update for MU440EX Motherboards

GENERAL INFORMATION

Basic MU440EX Motherboard Identification Information

AA Revision	PBA Revision	440EX AGPSet Stepping	BIOS Revision	Notes
698722-402	695747-402	A0	4M4UE0X1.86A.0003.P02	1-5
698722-403	695747-403	A0	4M4UE0X1.86A.0004.P03	1-5
698722-404	695747-404	A0	4M4UE0X1.86A.0005.P04	1-5
698722-405	695747-405	A0	4M4UE0X1.86A.0008.P07	1-5
698722-500	695747-500	A0	4M4UE0X1.86A.0011.P10	1-5
698722-501	695747-501	A0	4M4UE0X1.86A.0011.P10	1-5
698722-502	695747-502	A0	4M4UE0X1.86A.0011.P10	1-5
698722-503	695747-503	A0	4M4UE0X1.86A.0011.P10	1-5
702993-402	695747-402	A0	4M4UE0X1.86A.0003.P02	1-5
702993-403	695747-403	A0	4M4UE0X1.86A.0004.P03	1-5
702993-404	695747-404	A0	4M4UE0X1.86A.0005.P04	1-5
702993-405	695747-405	A0	4M4UE0X1.86A.0008.P07	1-5
702993-500	695747-500	A0	4M4UE0X1.86A.0011.P10	1-5
702993-501	695747-501	A0	4M4UE0X1.86A.0011.P10	1-5
702993-502	695747-502	A0	4M4UE0X1.86A.0011.P10	1-5
702999-402	695747-402	A0	4M4UE0X1.86A.0003.P02	1-5
702999-403	695747-403	A0	4M4UE0X1.86A.0004.P03	1-5
702999-404	695747-404	A0	4M4UE0X1.86A.0005.P04	1-5
702999-405	695747-405	A0	4M4UE0X1.86A.0008.P07	1-5



AA Revision	PBA Revision	440EX AGPSet Stepping	BIOS Revision	Notes
702999-500	695747-500	A0	4M4UE0X1.86A.0011.P10	1-5
702999-501	695747-501	A0	4M4UE0X1.86A.0011.P10	1-5
702999-502	695747-502	A0	4M4UE0X1.86A.0011.P10	1-5
718659-405	718658-405	A0	4M4UE0X3.86A.0003.P02	1-5
718659-500	718658-500	A0	4M4UE0X3.86A.0004.P03	1-5
718659-501	718658-501	A0	4M4UE0X3.86A.0004.P03	1-5
718659-502	718658-502	A0	4M4UE0X3.86A.0005.P04	1-5
718659-503	718658-503	A0	4M4UE0X3.86A.0006.P05	1-5

NOTES:

1. The PBA number or AA number is found on a small label on the component side of the board.
2. The 440BX AGPset kit used on this PBA revision consists of two components as follows:

Device	Stepping	S-Spec Numbers
82443EX	A0	SL2SA
82371EB	A0	SL2MY

3. The following errata are contained in the *Pentium® II Processor Specification Update* (Order Number 243337) for the Pentium II processor and either do not apply to the MU440EX motherboard or have been worked-around in this PBA and/or BIOS revision: 3, 10-11, 17, 1AP-3AP. All other errata associated with the processor apply to this PBA revision.
4. The following items are contained in the *Intel® 82443EX Specification Update* (Order Number TBD) and either do not apply to the MU440EX motherboard or have been worked around in this PBA and/or BIOS revision: None. All other errata associated with the PCIs set apply to this PBA revision.
5. The following items are contained in the *Intel® 82371EB (PIIX4E) Specification Update* (Order Number 290635) and either do not apply to the MU440EX motherboard or have been worked around in this PBA and/or BIOS revision: None. All other errata associated with the PIIX4E apply to this PBA revision.

Summary Table of Changes

The following table indicates the Specification Changes, Errata, Specification Clarifications, or Documentation Changes which apply to the MU440EX motherboard. Intel intends to fix some of the errata in a future revision of the motherboard, and to account for the other outstanding issues through documentation or specification changes as noted. This table uses the following notations:

CODES USED IN SUMMARY TABLE

- Doc: Document change or update that will be implemented.
- Fix: This erratum is intended to be fixed in a future revision of the motherboard or BIOS.
- Fixed: This erratum has been previously fixed.
- NoFix: There are no plans to fix this erratum.
- Shaded: This erratum is either new or modified from the previous version of the document.

NO.	PLANS	SPECIFICATION CHANGES
1	Doc	Support for 300 MHz Intel® Celeron™ Processors
2	Doc	Addition of optional graphics subsystem
3	Doc	Support for 300A, 333, 366, and 400 MHz Intel Celeron processors
NO.	PLANS	ERRATA
1	Fixed	Serial mouse activity does not wake system after APM shutdown
2	NoFix	Advanced Power Management may suspend system during CD-ROM playback
3	Fixed	System may hang with Pentium® II processor
4	Fixed	System using 3-mode floppy drive cannot read XDF format diskettes
5	Fixed	Onboard audio does not restart wave files upon return from APM suspend
6	Fixed	User can restore BIOS defaults with Administrator Password set
7	Fixed	BIOS does not log events when logging is enabled
8	Fixed	BIOS Setup does not display LAN and audio options after audio is disabled
9	Fixed	System BIOS may disconnect controllerless modems
10	Fixed	System may fail to boot with powered USB hub attached
11	NoFix	The MEMHOLE feature has been removed from the system BIOS
12	Fixed	System BIOS does not report that memory has decreased in size during the POST process
13	Fixed	System BIOS does not recognize some keyboards unless NUMLOCK option is set to Auto
14	Fix	Key combination locks keyboard if user password is set
15	Fixed	System will not boot from ISA video adapter if Scan User Flash is enabled

NO.	PLANS	DOCUMENTATION CHANGES
1	Doc	Change to description of Manufacturing Options
2	Doc	In Section 1.7, Main Memory, “unbuffered” should be “unbuffered.” In Section 1.7, Main Memory, “unbuffered” should be “unbuffered”
3	Doc	Change to Section 3.8, Desktop Management Interface
4	Doc	Change to Section 1.22, Power Supply Considerations

The errata described in this specification update apply to combinations of PBA revision and BIOS revision as shown in the table below. Descriptions of the individual errata referred to by number in the table below are found in the ERRATA section of this document.

PBA Revision	BIOS Revision	Errata That Apply
695747-402	4M4UE0X1.86A.0003.P02	1-7, 9-10, 14-15
	4M4UE0X1.86A.0004.P03	1-5, 9-10, 14-15
	4M4UE0X1.86A.0005.P04	2-3, 5, 9-11, 14-15
	4M4UE0X1.86A.0008.P07	2-3, 5, 8-11, 13-15
	4M4UE0X1.86A.0010.P09	2-3, 5, 9-11, 13-15
	4M4UE0X1.86A.0011.P10	2-3, 5, 9, 11, 14-15
	4M4UE0X1.86A.0012.P11	2-3, 5, 11, 14
695747-403	4M4UE0X1.86A.0003.P02 [†]	1-7, 9-10, 14-15
	4M4UE0X1.86A.0004.P03	1-5, 9-10, 14-15
	4M4UE0X1.86A.0005.P04	2-3, 5, 9-11, 14-15
	4M4UE0X1.86A.0008.P07	2-3, 5, 8-11, 13-15
	4M4UE0X1.86A.0010.P09	2-3, 5, 9-11, 13-15
	4M4UE0X1.86A.0011.P10	2-3, 5, 9, 11, 14-15
	4M4UE0X1.86A.0012.P11	2-3, 5, 11, 14
695747-404	4M4UE0X1.86A.0003.P02 [†]	1-7, 9-10, 14-15
	4M4UE0X1.86A.0004.P03 [†]	1-5, 9-10, 14-15
	4M4UE0X1.86A.0005.P04	2-3, 5, 9-11, 14-15
	4M4UE0X1.86A.0008.P07	2-3, 5, 8-11, 13-15
	4M4UE0X1.86A.0010.P09	2-3, 5, 9-11, 13-15
	4M4UE0X1.86A.0011.P10	2-3, 5, 9, 11, 14-15
	4M4UE0X1.86A.0012.P11	2-3, 5, 11, 14
695747-405	4M4UE0X1.86A.0003.P02 [†]	1-7, 9-10, 14-15
	4M4UE0X1.86A.0004.P03 [†]	1-5, 9-10, 14-15
	4M4UE0X1.86A.0005.P04 [†]	2-3, 5, 9-11, 14-15
	4M4UE0X1.86A.0008.P07	2-3, 5, 8-11, 13-15
	4M4UE0X1.86A.0010.P09	2-3, 5, 9-11, 13-15
	4M4UE0X1.86A.0011.P10	2-3, 5, 9, 11, 14-15
	4M4UE0X1.86A.0012.P11	2-3, 5, 11, 14

PBA Revision	BIOS Revision	Errata That Apply
695747-500	4M4UE0X1.86A.0003.P02 [†]	1-7, 9-10, 14-15
	4M4UE0X1.86A.0004.P03 [†]	1-5, 9-10, 14-15
	4M4UE0X1.86A.0005.P04 [†]	2-3, 5, 9-11, 14-15
	4M4UE0X1.86A.0008.P07 [†]	2-3, 5, 8-11, 13-15
	4M4UE0X1.86A.0010.P09 [†]	2-3, 5, 9-11, 13-15
	4M4UE0X1.86A.0011.P10	2-3, 5, 9, 11, 14-15
	4M4UE0X1.86A.0012.P11	2-3, 5, 11, 14
695747-501	4M4UE0X1.86A.0003.P02 [†]	1-7, 9-10, 14-15
	4M4UE0X1.86A.0004.P03 [†]	1-5, 9-10, 14-15
	4M4UE0X1.86A.0005.P04 [†]	2-3, 5, 9-11, 14-15
	4M4UE0X1.86A.0008.P07 [†]	2-3, 5, 8-11, 13-15
	4M4UE0X1.86A.0010.P09 [†]	2-3, 5, 9-11, 13-15
	4M4UE0X1.86A.0011.P10	2-3, 5, 9, 11, 14-15
	4M4UE0X1.86A.0012.P11	2-3, 5, 11, 14
695747-502	4M4UE0X1.86A.0003.P02 [†]	1-7, 9-10, 14-15
	4M4UE0X1.86A.0004.P03 [†]	1-5, 9-10, 14-15
	4M4UE0X1.86A.0005.P04 [†]	2-3, 5, 9-11, 14-15
	4M4UE0X1.86A.0008.P07 [†]	2-3, 5, 8-11, 13-15
	4M4UE0X1.86A.0010.P09 [†]	2-3, 5, 9-11, 13-15
	4M4UE0X1.86A.0011.P10	2-3, 5, 9, 11, 14-15
	4M4UE0X1.86A.0012.P11	2-3, 5, 11, 14
695747-503	4M4UE0X1.86A.0003.P02 [†]	1-7, 9-10, 14-15
	4M4UE0X1.86A.0004.P03 [†]	1-5, 9-10, 14-15
	4M4UE0X1.86A.0005.P04 [†]	2-3, 5, 9-11, 14-15
	4M4UE0X1.86A.0008.P07 [†]	2-3, 5, 8-11, 13-15
	4M4UE0X1.86A.0010.P09 [†]	2-3, 5, 9-11, 13-15
	4M4UE0X1.86A.0011.P10	2-3, 5, 9, 11, 14-15
	4M4UE0X1.86A.0012.P11	2-3, 5, 11, 14
618658-405	4M4UE0X3.86A.0003.P02	2, 5, 9, 11-12, 14-15
	4M4UE0X3.86A.0004.P03	2, 5, 9, 11, 14-15
	4M4UE0X3.86A.0005.P04	2, 5, 11, 14-15
	4M4UE0X3.86A.0006.P05	2, 5, 11, 14

PBA Revision	BIOS Revision	Errata That Apply
618658-500	4M4UE0X3.86A.0003.P02 [†]	2, 5, 9, 11-12, 14-15
	4M4UE0X3.86A.0004.P03	2, 5, 9, 11, 14-15
	4M4UE0X3.86A.0005.P04	2, 5, 11, 14-15
	4M4UE0X3.86A.0006.P05	2, 5, 11, 14
618658-501	4M4UE0X3.86A.0003.P02 [†]	2, 5, 9, 11-12, 14-15
	4M4UE0X3.86A.0004.P03	2, 5, 9, 11, 14-15
	4M4UE0X3.86A.0005.P04	2, 5, 11, 14-15
	4M4UE0X3.86A.0006.P05	2, 5, 11, 14
618658-502	4M4UE0X3.86A.0003.P02 [†]	2, 5, 9, 11-12, 14-15
	4M4UE0X3.86A.0004.P03 [†]	2, 5, 9, 11, 14-15
	4M4UE0X3.86A.0005.P04	2, 5, 11, 14-15
	4M4UE0X3.86A.0006.P05	2, 5, 11, 14
618658-503	4M4UE0X3.86A.0003.P02 [†]	2, 5, 9, 11-12, 14-15
	4M4UE0X3.86A.0004.P03 [†]	2, 5, 9, 11, 14-15
	4M4UE0X3.86A.0005.P04 [†]	2, 5, 11, 14-15
	4M4UE0X3.86A.0006.P05	2, 5, 11, 14

[†] Note: This combination of BIOS revision and PBA revision has not undergone regression testing. Use of a PBA with down-revision BIOS is an untested combination and is undertaken at the user's risk.



SPECIFICATION CHANGES

The Specification Changes listed in this section apply to the *MU440EX Motherboard Technical Product Specification* (Order Number 701003). All Specification Changes will be incorporated into a future version of that specification.

1. **Support for 300 MHz Intel® Celeron™ Processors**

The motherboard supports 300 MHz Intel® Celeron™ processors. Section 1.6, Microprocessor, will be modified to add 300 MHz to the list of supported processor speeds.

The table of processor speeds in Section 1.6 will be modified to add the following line:

Processor Type	Processor Speed	Packaging Type
Celeron	300 MHz	S.E.P. package

BIOS revision 4M4UE0X1.86A.0005.P04 or later is required for the motherboard to properly support a 300 MHz processor.

2. **Addition of Optional Graphics Subsystem**

The following will be added to Section 1.11 as an optional video configuration:

An optional graphics subsystem features the ATI Rage* Pro Turbo 2X graphics controller. See Intel's World Wide Web site (see Section 6.1) for graphics drivers.

ATI RAGE PRO TURBO 2X GRAPHICS CONTROLLER

The ATI Rage Pro Turbo 2X Graphics Controller provides the following features:

- Comprehensive A.G.P. support, including 1X (66 MHz) and 2X (133 MHz) fully pipelined operation and sideband support
- Full bus mastering support
- Triple 8-bit palette DAC with gamma correction. Pixel rates up to 230 MHz
- Supports DDC1 and DDC2B+ for Plug and Play monitors
- Game acceleration including support for Microsoft's DirectDraw*: double buffering, virtual sprites, transparent blit, masked blit, and context chaining
- 4 KB on-chip texture cache
- Direct3D* texture lighting
- 4 MB of 100 MHz SGRAM on the motherboard

Motion Video Acceleration

The ATI Rage* Pro Turbo 2X supports motion video acceleration by providing:

- Multistream video for video conferencing
- Filtered horizontal/vertical, up/down, scaling enhances playback quality
- Enhanced line buffer allows vertical filtering of native MPEG-2 size (720 x 480) images
- DVD/MPEG-2 decode assist
- Filter circuitry that eliminates video artifacts caused by displaying interlaced video on noninterlaced displays
- Hardware mirroring for flipping video images in video conferencing systems
- Bidirectional bus mastering engine with planar YUV-to-packed format converter
- YUV to RGB color space converter with support for both packed and planar YUV:
 - YUV 4:2:2, YUV 4:1:0, and YUV 4:2:0
 - RGB 32, RGB 16/15, RGB 8, and monochrome

3. Support for 300A, 333, 366, and 400 MHz Intel® Celeron™ Processors

The motherboard supports 300A, 333, 366, and 400 MHz Intel® Celeron™ processors. Section 1.6, Microprocessor, will be modified to add these to the list of supported processor speeds.

The table of processor speeds in Section 1.6 will be modified to add the following lines:

Processor Type	Processor Speed	Packaging Type
Celeron	300A MHz	S.E.P. package
Celeron	333 MHz	S.E.P. package
Celeron	366 MHz	S.E.P. package
Celeron	400 MHz	S.E.P. package

BIOS revision 4M4UE0X1.86A.0011.P10 or later or BIOS revision 4M4UE0X3.86A.0004.P03 or later is required for the motherboard to properly support these processors.

ERRATA

1. ***Serial Mouse Activity Does Not Wake System After APM Shutdown***

PROBLEM: The system BIOS does not recognize activity from a serial mouse as an APM event.

IMPLICATION: The system will not be restored from a power-managed state until keyboard activity occurs. BIOS 4M4UE0X3.86A is not subject to this erratum.

WORKAROUND: The system BIOS does recognize activity from a PS/2 style mouse.

STATUS: This erratum was fixed in BIOS revision 4M4UE0X1.86A.0005.P04.

2. ***Advanced Power Management May Suspend System During CD-ROM Playback***

PROBLEM: ATAPI devices (such as CD-ROM and DVD drives) do not reset the inactivity timer that is used by Advanced Power Management to determine when to place the system into suspend mode.

IMPLICATION: When playback of an audio CD or a DVD file is the only system activity, the system will go into suspend mode when the inactivity timer expires.

WORKAROUND: Temporarily disable the Low-power standby and Shut off monitor options on the Display Properties, Screen Saver menu. This menu is available from the Windows* 95 Control Panel.

STATUS: This erratum will not be fixed.

3. ***System May Hang With Pentium® II Processor***

PROBLEM: The design of the motherboard may allow the voltage on the Vtt line to drop below the minimum required by the Pentium® II processor.

IMPLICATION: During periods of high processor usage (for example, in a 3D graphics program), some systems using the Pentium II processor may lock up, requiring system power to be recycled in order to restart. This erratum does not affect systems using the Intel® Celeron™ processor. Boards with PBA 618658 are not subject to this erratum.

WORKAROUND: None.

STATUS: This erratum was fixed in PBA revision 695747-405.

4. ***System Using 3-Mode Floppy Drive Cannot Read XDF Format Diskettes***

PROBLEM: The buffer area that stores floppy drive parameters does not have room to store the speed information to allow a 3-mode floppy drive to read a diskette in the XDF format.

IMPLICATION: A system that has a 3-mode floppy drive cannot be used to install a program or operating system, such as PC-DOS 7.0, that is distributed on XDF format diskettes. BIOS 4M4UE0X3.86A is not subject to this erratum.

WORKAROUND: None.

STATUS: This erratum was fixed in BIOS revision 4M4UE0X1.86A.0005.P04.

5. *Onboard Audio Does Not Restart Wave Files Upon Return From APM Suspend*

PROBLEM: If a DOS game is playing a wave audio (WAV) file at the time the system goes into suspend mode, the audio will not resume when the system returns from suspend mode.

IMPLICATION: No wave audio will be available until the system is restarted.

WORKAROUND: None.

STATUS: This erratum was fixed in audio driver revision 4.05.1018.

6. *User Can Restore BIOS Defaults With Administrator Password Set*

PROBLEM: The user can use the F9 key in the BIOS Setup program to restore CMOS defaults even though an administrator password has been set.

IMPLICATION: The user may be able to change a setting that the administrator had set for network management reasons. BIOS 4M4UE0X3.86A is not subject to this erratum.

WORKAROUND: None.

STATUS: This erratum was fixed in BIOS revision 4M4UE0X1.86A.0004.P03.

7. *BIOS Does Not Log Events When Logging is Enabled*

PROBLEM: The BIOS does not update the event log even though Event Logging is enabled in the BIOS Setup program.

IMPLICATION: The user will not have access to information that might assist in troubleshooting system problems. BIOS 4M4UE0X3.86A is not subject to this erratum.

WORKAROUND: None.

STATUS: This erratum was fixed in BIOS revision 4M4UE0X1.86A.0004.P03.

8. *BIOS Setup Does Not Display LAN and Audio Options After Audio is Disabled*

PROBLEM: The options to enable or disable onboard LAN and audio functions are not displayed by the BIOS Setup program if audio has been disabled in Setup.

IMPLICATION: The user will not be able to re-enable audio or change the status of the onboard LAN subsystem if audio has been disabled. BIOS revisions 4M4UE0X1.86A.0005.P04 and earlier and all revisions of BIOS 4M4UE0X3.86A are not subject to this erratum.

WORKAROUND: Restore default settings in the BIOS Setup program and restart the computer. This will re-enable the audio subsystem and restore the option to control LAN settings.

STATUS: This erratum was fixed in BIOS revision 4M4UE0X1.86A.0010.P09.

9. System BIOS May Disconnect Controllerless Modems

PROBLEM: Processor latency caused by internal BIOS routines may cause controllerless modems to lose connections with remote modems.

IMPLICATION: The user may be forced to reconnect in order to complete data transfers.

WORKAROUND: None.

STATUS: This erratum was fixed in BIOS revision 4M4UE0X1.86A.0012.P11 and in BIOS revision 4M4UE0X3.86A.0005.P04.

10. System May Fail to Boot With Powered USB Hub Attached

PROBLEM: If a powered USB hub is connected to the system with no USB device plugged into the hub, the system may boot very slowly or not boot at all. The hub will work normally if the system completes the boot process or if it is connected to the USB port after boot.

IMPLICATION: A powered USB hub may require multiple reboots before the system can be used. BIOS 4M4UE0X3.86A is not subject to this erratum.

WORKAROUND: Unplug the hub during the boot process, or plug a USB device that does not have an integrated USB hub into the onboard hub before booting the system.

STATUS: This erratum was fixed in BIOS revision 4M4UE0X1.86A.0011.P10.

11. The MEMHOLE Feature has Been Removed From the System BIOS

PROBLEM: The MEMHOLE feature, which allows the user to reserve an area below the 1 MB memory boundary for use by an add-in card, has been removed from the system BIOS beginning with BIOS revisions 4M4UE0X1.86A.0005.P04 and 4M4UE0X3.86A.0003.P02.

IMPLICATION: ISA add-in cards that require reserved memory space below the 1 MB address may not function with this motherboard.

WORKAROUND: None.

STATUS: This erratum will not be fixed.

12. System BIOS Does Not Report That Memory has Decreased in Size During the POST Process

PROBLEM: No error message is generated if the BIOS finds during the POST process that the amount of system memory has decreased. No record of the event is placed in the DMI event log.

IMPLICATION: If a portion of memory becomes unusable, the user will not receive advance warning that less memory than expected is available to the system. BIOS 4M4UE0X1.86A is not subject to this erratum.

WORKAROUND: None.

STATUS: This erratum was fixed in BIOS revision 4M4UE0X3.86A.0004.P03.

13. System BIOS Does Not Recognize Some Keyboards Unless NUMLOCK Option Is Set to Auto

PROBLEM: If the NUMLOCK option in the BIOS Setup program is set to anything other than Auto, the system BIOS may not recognize a PS/2 keyboard at boot time. If this option is set to Auto, on those keyboards the initial NUMLOCK state after boot will be Off instead of On. BIOS revisions 4M4UE0X1.86A.0005.P04 and earlier are not subject to this erratum.

IMPLICATION: A user may not be able to use the options in the BIOS Setup program to control the initial state of the NUMLOCK key automatically. BIOS 4M4UE0X3.86A is not subject to this erratum.

WORKAROUND: None.

STATUS: This erratum was fixed in BIOS revision 4M4UE0X1.86A.0011.P10.

14. Key Combination Locks Keyboard if User Password is Set

PROBLEM: If a user password has been set in the BIOS Setup program, the <Ctrl><Alt><L> key combination will lock the keyboard. The user password must be entered to unlock the keyboard and resume use of the system.

IMPLICATION: Software that requires that key combination for some other purpose can only be used if the user password feature is turned off.

WORKAROUND: None.

STATUS: This erratum will be fixed in a future BIOS revision.

15. System Will Not Boot From ISA Video Adapter if Scan User Flash is Enabled

PROBLEM: If the option to scan the user flash area during the boot process is enabled in the BIOS setup program, the system will hang when the BIOS attempts to initialize an ISA video adapter. This erratum does not affect PCI video adapters.

IMPLICATION: A user who requires an ISA video adapter will not be able to use the scan user flash area option.

WORKAROUND: None.

STATUS: This erratum was fixed in BIOS revision 4M4UE0X3.86A.0006.P05 and in BIOS revision 4M4UE0X1.86A.0012.P11.

DOCUMENTATION CHANGES

The Documentation Changes listed in this section apply to the *MU440EX Motherboard Technical Product Specification* (Order Number 701003). All Documentation Changes will be incorporated into a future version of that specification.

1. *Change to Description of Manufacturing Options*

In Section 1.2, Manufacturing Options, paragraph one will be replaced in its entirety as follows:

The following are manufacturing options. Not all manufacturing options are available in all marketing channels. Please contact your Intel representative to determine what manufacturing options are available to you.

2. *Refer to Summary Table of Changes*

3. *Change to Section 3.8, Desktop Management Interface*

In Section 3.8, Desktop Management Interface (DMI), paragraph 2 will be replaced in its entirety as follows:

Intel can provide system manufacturers with a utility that programs system and chassis-related information into the DMI space in Flash memory. The utility is used to program the BIOS during system manufacturing, so that the BIOS can later report this information. Once written, this information cannot be overwritten by the end user.

4. *Change to Section 1.22, Power Supply Considerations*

In Section 1.22, Power Supply Considerations, the first sentence will be replaced in its entirety as follows:

For typical configurations, the motherboard is designed to operate with a 90 to 200 W power supply.

