



AP440FX Motherboard Specification Update

Release Date: September 1997

Order Number: 281831-011

The AP440FX 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.

Information in this document is provided in connection with Intel products. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Intel's Terms and Conditions of Sale for such products, Intel assumes no liability whatsoever, and Intel disclaims any express or implied warranty, relating to sale and/or use of Intel products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright or other intellectual property right. Intel products are not intended for use in medical, life saving, or life sustaining applications.

Intel retains the right to make changes to specifications and product descriptions at any time, without notice.

The AP440FX 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.

Contact your local Intel sales office or your distributor to obtain the latest specifications before placing your product order.

* Third-party brands and names are the property of their respective owners.

Copies of documents which have an ordering number and are referenced in this document, or other Intel literature, may be obtained from:

Intel Corporation
P.O. Box 7641
Mt. Prospect, IL 60056-7641

or call in North America 1-800-879-4683, Europe 44-0-1793-431-155, France 44-0-1793-421-777,
Germany 44-0-1793-421-333, other Countries 708-296-9333

Copyright © 1997, Intel Corporation

CONTENTS

REVISION HISTORY v

PREFACE vi

Specification Update for AP440FX Motherboards

GENERAL INFORMATION..... 3

SPECIFICATION CHANGES 14

ERRATA..... 15

SPECIFICATION CLARIFICATIONS 18

DOCUMENTATION CHANGES 19

REVISION HISTORY

Date of Revision	Version	Description
August 1996	-001	This document is the first Specification Update for the Intel AP440FX motherboard.
October 1996	-002	Added Erratum 2 and Specification Clarification 1.
November 1996	-003	Added Errata 3-4.
December 1996	-004	Added Specification Change 1, Errata 5-6, Specification Clarification 2 and Documentation Changes 1-3.
January 1997	-005	Added Specification Changes 2-4, Erratum 7 and Documentation Change 4.
March 1997	-006	Added AA Revision to Motherboard Identification table. Added Documentation Change 5. Updated status of Erratum 7.
April 1997	-007	Revised format of PBA/BIOS revision table. Replaced Specification Clarification 1 with Erratum 8. Added Documentation Changes 6-7.
May 1997	-008	Updated status of Erratum 3, added Documentation Change 8.
June 1997	-009	Removed Specification Changes 1-4, Specification Clarifications 1-2 and Documentation Changes 1-8, which were incorporated into revision -002 of the specification. Added Specification Clarifications 1-2.
July 1997	-010	Added Specification Change 1, Erratum 9 and Documentation Changes 1-3.
September 1997	-011	Added Erratum 10.

PREFACE

This document is an update to the specifications contained in the *AP440FX Motherboard Technical Product Specification* (Order Number 281830). 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® Pro Processor Specification Update* for specification updates concerning the Pentium Pro processor. Items contained in the *Pentium Pro Processor Specification Update* that either do not apply to the AP440FX 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 *82440FX PCIset Specification Update* (Order Number 297654) for specification updates concerning the 82440FX PCIset. Items contained in the *82440FX PCIset Specification Update* that either do not apply to the AP440FX motherboard or have been worked around are noted in this document. Otherwise, it should be assumed that any PCIset errata for a given stepping are applicable to the PBA revision(s) associated with that stepping.

Refer to the *82371SB PIIX3 Specification Update* (Order Number 297658) for specification updates concerning the 82371SB PIIX3. Items contained in the *82371SB PIIX3 Specification Update* that either do not apply to the AP440FX motherboard or have been worked around are noted in this document. Otherwise, it should be assumed that any PIIX3 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 AP440FX 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 AP440FX Motherboards

GENERAL INFORMATION

Basic AP440FX Motherboard Identification Information

AA Revision	PBA Revision	82440FX PCIset Stepping	BIOS Revision	Notes
657764-702	657763-702	A1	1.00.02.CT1	1, 2, 3, 4, 5
657764-703	657763-703	A1	1.00.03.CT1	1, 2, 3, 4, 5
657764-704	657763-704	A1	1.00.03.CT1	1, 2, 3, 4, 5
657764-705	657763-705	A1	1.00.05.CT1	1, 2, 3, 4, 5
657764-721	657763-721	A1	1.00.05.CT1	1, 2, 3, 4, 5
657764-722	657763-722	A1	1.00.06.CT1	1, 2, 3, 4, 5
657764-723	657763-723	A1	1.00.07.CT1	1, 2, 3, 4, 5
672346-800	672342-800	A1	1.00.06.CT1	1, 2, 3, 4, 5
672346-801	672342-801	A1	1.00.07.CT1	1, 2, 3, 4, 5
672346-802	672342-802	A1	1.00.07.CT1	1, 2, 3, 4, 5
672346-803	672342-803	A1	1.00.08.CT1	1, 2, 3, 4, 5
672346-804	672342-804	A1	1.00.08.CT1	1, 2, 3, 4, 5
672346-805	672342-805	A1	1.00.10.CT1	1, 2, 3, 4, 5
667955-721	667954-721	A1	1.00.05.CT1	1, 2, 3, 4, 5
667955-722	667954-722	A1	1.00.06.CT1	1, 2, 3, 4, 5
667955-723	667954-723	A1	1.00.07.CT1	1, 2, 3, 4, 5
667955-800	667954-800	A1	1.00.07.CT1	1, 2, 3, 4, 5
667955-801	667954-801	A1	1.00.08.CT1	1, 2, 3, 4, 5
667955-802	667954-802	A1	1.00.08.CT1	1, 2, 3, 4, 5
667955-803	667954-803	A1	1.00.10.CT1	1, 2, 3, 4, 5
673804-800	673803-800	A1	1.00.06.CT1	1, 2, 3, 4, 5
673804-801	673803-801	A1	1.00.08.CT1	1, 2, 3, 4, 5
673804-802	673803-802	A1	1.00.08.CT1	1, 2, 3, 4, 5
673804-804	673803-804	A1	1.00.10.CT1	1, 2, 3, 4, 5

NOTES:

- The PBA number is found on a small label on the component side of the board.
- The 82440FX PCIset kit used on this PBA revision consists of three components as follows:

Device	Stepping	S-Spec Numbers
82441FX	A1	SU053
82442FX	A1	SU054
82371SB	B0	SU093

3. The following errata are contained in the *Pentium® Pro Processor Specification Update* for the Pentium Pro processor and either do not apply to the AP440FX motherboard or have been worked-around in this PBA and/or BIOS revision: 1, 4, 14-15, 25, 41, 50, 63, and 1AP-9AP. All other errata associated with the processor apply to this PBA revision.
4. The following items are contained in the *Intel 440FX PCIset Specification Update* (Order Number 297654) and either do not apply to the AP440FX motherboard or have been worked around in this PBA and/or BIOS revision:
82441FX (PMC) Erratum 2.
All other errata associated with the PCIset apply to this PBA revision.
5. The following items are contained in the *82371SB PIIX3 Stepping Information* (Order Number 297658) and either do not apply to the AP440FX motherboard or have been worked around in this PBA and/or BIOS revision: 1-9, 13.
All other errata associated with the PIIX3 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 AP440FX 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	User password clear feature
NO.	PLANS	ERRATA
1	NoFix	CS32DIAG conflicts with CrystalWare* Audio CD Player
2	Fix	System BIOS does not recognize bootable USB devices
3	Fixed	BIOS does not support no-emulation mode for CD-ROM boot
4	Fix	System may prevent configuration of ISA Plug and Play add-in cards
5	NoFix	PCI device scan may terminate abnormally
6	Fixed	CMOS checksum may be lost if power is cycled during boot
7	Fixed	System may hang at boot due to incorrect 60 ns memory timings
8	NoFix	Cannot meet FCC Class B requirements using unshielded USB cable
9	Fix	Management extension ASIC may fail to reset at power-on
10	Fixed	Onboard audio solution is not detected by BIOS
NO.	PLANS	SPECIFICATION CLARIFICATIONS
1	Doc	Advanced Power Management (APM) will not function as expected with Universal Serial Bus (USB) enabled
2	Doc	PCI 2.1 Specification optional features
NO.	PLANS	DOCUMENTATION CHANGES
1	Doc	Revision of Section 1.7.1, 82441FX PCI Bridge and Memory Controller (PMC)
2	Doc	Revision of Section 3.14.12, Security Screen
1	Doc	Revision of Section 1.16.1, 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 to This Combination
657763-702	1.00.02.CT1	1-9
	1.00.03.CT1	1-9
	1.00.04.CT1	1-5, 7-9
	1.00.05.CT1	1-5, 8-9
	1.00.06.CT1	1-5, 8-9
	1.00.07.CT1	1-2, 4-5, 8-9
	1.00.08.CT1	1-2, 4-5, 8-9
	1.00.09.CT1	1-2, 4-5, 8-10
	1.00.10.CT1	1-2, 4-5, 8-9
657763-703	1.00.02.CT1 [†]	1-9
	1.00.03.CT1	1-9
	1.00.04.CT1	1-5, 7-9
	1.00.05.CT1	1-5, 8-9
	1.00.06.CT1	1-5, 8-9
	1.00.07.CT1	1-2, 4-5, 8-9
	1.00.08.CT1	1-2, 4-5, 8-9
	1.00.09.CT1	1-2, 4-5, 8-10
	1.00.10.CT1	1-2, 4-5, 8-9
657763-704	1.00.02.CT1 [†]	1-9
	1.00.03.CT1	1-9
	1.00.04.CT1	1-5, 7-9
	1.00.05.CT1	1-5, 8-9
	1.00.06.CT1	1-5, 8-9
	1.00.07.CT1	1-2, 4-5, 8-9
	1.00.08.CT1	1-2, 4-5, 8-9
	1.00.09.CT1	1-2, 4-5, 8-10
	1.00.10.CT1	1-2, 4-5, 8-9

PBA Revision	BIOS Revision	Errata That Apply to This Combination
657763-705	1.00.02.CT1 [†]	1-9
	1.00.03.CT1 [†]	1-9
	1.00.04.CT1 [†]	1-5, 7-9
	1.00.05.CT1	1-5, 8-9
	1.00.06.CT1	1-5, 8-9
	1.00.07.CT1	1-2, 4-5, 8-9
	1.00.08.CT1	1-2, 4-5, 8-9
	1.00.09.CT1	1-2, 4-5, 8-10
	1.00.10.CT1	1-2, 4-5, 8-9
657763-721	1.00.02.CT1 [†]	1-9
	1.00.03.CT1 [†]	1-9
	1.00.04.CT1 [†]	1-5, 7-9
	1.00.05.CT1	1-5, 8-9
	1.00.06.CT1	1-5, 8-9
	1.00.07.CT1	1-2, 4-5, 8-9
	1.00.08.CT1	1-2, 4-5, 8-9
	1.00.09.CT1	1-2, 4-5, 8-10
	1.00.10.CT1	1-2, 4-5, 8-9
657763-722	1.00.02.CT1 [†]	1-9
	1.00.03.CT1 [†]	1-9
	1.00.04.CT1 [†]	1-5, 7-9
	1.00.05.CT1 [†]	1-5, 8-9
	1.00.06.CT1	1-5, 8-9
	1.00.07.CT1	1-2, 4-5, 8-9
	1.00.08.CT1	1-2, 4-5, 8-9
	1.00.09.CT1	1-2, 4-5, 8-10
	1.00.10.CT1	1-2, 4-5, 8-9

PBA Revision	BIOS Revision	Errata That Apply to This Combination
657763-723	1.00.02.CT1 [†]	1-9
	1.00.03.CT1 [†]	1-9
	1.00.04.CT1 [†]	1-5, 7-9
	1.00.05.CT1 [†]	1-5, 8-9
	1.00.06.CT1 [†]	1-5, 8-9
	1.00.07.CT1	1-2, 4-5, 8-9
	1.00.08.CT1	1-2, 4-5, 8-9
	1.00.09.CT1	1-2, 4-5, 8-10
	1.00.10.CT1	1-2, 4-5, 8-9
672342-800	1.00.02.CT1 [†]	1-9
	1.00.03.CT1 [†]	1-9
	1.00.04.CT1 [†]	1-5, 7-9
	1.00.05.CT1 [†]	1-5, 8-9
	1.00.06.CT1	1-5, 8-9
	1.00.07.CT1	1-2, 4-5, 8-9
	1.00.08.CT1	1-2, 4-5, 8-9
	1.00.09.CT1	1-2, 4-5, 8-10
	1.00.10.CT1	1-2, 4-5, 8-9
672342-801	1.00.02.CT1 [†]	1-9
	1.00.03.CT1 [†]	1-9
	1.00.04.CT1 [†]	1-5, 7-9
	1.00.05.CT1 [†]	1-5, 8-9
	1.00.06.CT1 [†]	1-5, 8-9
	1.00.07.CT1	1-2, 4-5, 8-9
	1.00.08.CT1	1-2, 4-5, 8-9
	1.00.09.CT1	1-2, 4-5, 8-10
	1.00.10.CT1	1-2, 4-5, 8-9

PBA Revision	BIOS Revision	Errata That Apply to This Combination
672342-802	1.00.02.CT1 [†]	1-9
	1.00.03.CT1 [†]	1-9
	1.00.04.CT1 [†]	1-5, 7-9
	1.00.05.CT1 [†]	1-5, 8-9
	1.00.06.CT1 [†]	1-5, 8-9
	1.00.07.CT1	1-2, 4-5, 8-9
	1.00.08.CT1	1-2, 4-5, 8-9
	1.00.09.CT1	1-2, 4-5, 8-10
672342-803	1.00.02.CT1 [†]	1-9
	1.00.03.CT1 [†]	1-9
	1.00.04.CT1 [†]	1-5, 7-9
	1.00.05.CT1 [†]	1-5, 8-9
	1.00.06.CT1 [†]	1-5, 8-9
	1.00.07.CT1 [†]	1-2, 4-5, 8-9
	1.00.08.CT1	1-2, 4-5, 8-9
	1.00.09.CT1	1-2, 4-5, 8-10
672342-804	1.00.02.CT1 [†]	1-9
	1.00.03.CT1 [†]	1-9
	1.00.04.CT1 [†]	1-5, 7-9
	1.00.05.CT1 [†]	1-5, 8-9
	1.00.06.CT1 [†]	1-5, 8-9
	1.00.07.CT1 [†]	1-2, 4-5, 8-9
	1.00.08.CT1	1-2, 4-5, 8-9
	1.00.09.CT1	1-2, 4-5, 8-10
1.00.10.CT1	1-2, 4-5, 8-9	

PBA Revision	BIOS Revision	Errata That Apply to This Combination
672342-805	1.00.02.CT1 [†]	1-9
	1.00.03.CT1 [†]	1-9
	1.00.04.CT1 [†]	1-5, 7-9
	1.00.05.CT1 [†]	1-5, 8-9
	1.00.06.CT1 [†]	1-5, 8-9
	1.00.07.CT1 [†]	1-2, 4-5, 8-9
	1.00.08.CT1 [†]	1-2, 4-5, 8-9
	1.00.09.CT1 [†]	1-2, 4-5, 8-10
	1.00.10.CT1	1-2, 4-5, 8-9
667954-721	1.00.02.CT1 [†]	1-4, 6-9
	1.00.03.CT1 [†]	1-4, 6-9
	1.00.04.CT1 [†]	1-4, 7-9
	1.00.05.CT1	1-4, 8-9
	1.00.06.CT1	1-4, 8-9
	1.00.07.CT1	1-2, 4, 8-9
	1.00.08.CT1	1-2, 4, 8-9
	1.00.09.CT1	1-2, 4, 8-10
	1.00.10.CT1	1-2, 4, 8-9
667954-722	1.00.02.CT1 [†]	1-4, 6-9
	1.00.03.CT1 [†]	1-4, 6-9
	1.00.04.CT1 [†]	1-4, 7-9
	1.00.05.CT1 [†]	1-4, 8-9
	1.00.06.CT1	1-4, 8-9
	1.00.07.CT1	1-2, 4, 8-9
	1.00.08.CT1	1-2, 4, 8-9
	1.00.09.CT1	1-2, 4, 8-10
	1.00.10.CT1	1-2, 4, 8-9

PBA Revision	BIOS Revision	Errata That Apply to This Combination
667954-723	1.00.02.CT1 [†]	1-4, 6-9
	1.00.03.CT1 [†]	1-4, 6-9
	1.00.04.CT1 [†]	1-4, 7-9
	1.00.05.CT1 [†]	1-4, 8-9
	1.00.06.CT1 [†]	1-4, 8-9
	1.00.07.CT1	1-2, 4, 8-9
	1.00.08.CT1	1-2, 4, 8-9
	1.00.09.CT1	1-2, 4, 8-10
	1.00.10.CT1	1-2, 4, 8-9
667954-800	1.00.02.CT1 [†]	1-4, 6-9
	1.00.03.CT1 [†]	1-4, 6-9
	1.00.04.CT1 [†]	1-4, 7-9
	1.00.05.CT1 [†]	1-4, 8-9
	1.00.06.CT1 [†]	1-4, 8-9
	1.00.07.CT1	1-2, 4, 8-9
	1.00.08.CT1	1-2, 4, 8-9
	1.00.09.CT1	1-2, 4, 8-10
	1.00.10.CT1	1-2, 4, 8-9
667954-801	1.00.02.CT1 [†]	1-4, 6-9
	1.00.03.CT1 [†]	1-4, 6-9
	1.00.04.CT1 [†]	1-4, 7-9
	1.00.05.CT1 [†]	1-4, 8-9
	1.00.06.CT1 [†]	1-4, 8-9
	1.00.07.CT1 [†]	1-2, 4, 8-9
	1.00.08.CT1	1-2, 4, 8-9
	1.00.09.CT1	1-2, 4, 8-10
	1.00.10.CT1	1-2, 4, 8-9

PBA Revision	BIOS Revision	Errata That Apply to This Combination
667954-802	1.00.02.CT1 [†]	1-4, 6-9
	1.00.03.CT1 [†]	1-4, 6-9
	1.00.04.CT1 [†]	1-4, 7-9
	1.00.05.CT1 [†]	1-4, 8-9
	1.00.06.CT1 [†]	1-4, 8-9
	1.00.07.CT1 [†]	1-2, 4, 8-9
	1.00.08.CT1	1-2, 4, 8-9
	1.00.09.CT1	1-2, 4, 8-10
	1.00.10.CT1	1-2, 4, 8-9
667954-803	1.00.02.CT1 [†]	1-4, 6-9
	1.00.03.CT1 [†]	1-4, 6-9
	1.00.04.CT1 [†]	1-4, 7-9
	1.00.05.CT1 [†]	1-4, 8-9
	1.00.06.CT1 [†]	1-4, 8-9
	1.00.07.CT1 [†]	1-2, 4, 8-9
	1.00.08.CT1 [†]	1-2, 4, 8-9
	1.00.09.CT1 [†]	1-2, 4, 8-10
	1.00.10.CT1	1-2, 4, 8-9
673803-800	1.00.02.CT1 [†]	1-9
	1.00.03.CT1 [†]	1-9
	1.00.04.CT1 [†]	1-5, 7-9
	1.00.05.CT1 [†]	1-5, 8-9
	1.00.06.CT1	1-5, 8-9
	1.00.07.CT1	1-2, 4-5, 8-9
	1.00.08.CT1	1-2, 4-5, 8-9
	1.00.09.CT1	1-2, 4-5, 8-10
	1.00.10.CT1	1-2, 4-5, 8-9

PBA Revision	BIOS Revision	Errata That Apply to This Combination
673803-801	1.00.02.CT1 [‡]	1-9
	1.00.03.CT1 [‡]	1-9
	1.00.04.CT1 [‡]	1-5, 7-9
	1.00.05.CT1 [‡]	1-5, 8-9
	1.00.06.CT1 [‡]	1-5, 8-9
	1.00.07.CT1 [‡]	1-2, 4-5, 8-9
	1.00.08.CT1	1-2, 4-5, 8-9
	1.00.09.CT1	1-2, 4-5, 8-10
	1.00.10.CT1	1-2, 4-5, 8-9
673803-802	1.00.02.CT1 [‡]	1-9
	1.00.03.CT1 [‡]	1-9
	1.00.04.CT1 [‡]	1-5, 7-9
	1.00.05.CT1 [‡]	1-5, 8-9
	1.00.06.CT1 [‡]	1-5, 8-9
	1.00.07.CT1 [‡]	1-2, 4-5, 8-9
	1.00.08.CT1	1-2, 4-5, 8-9
	1.00.09.CT1	1-2, 4-5, 8-10
	1.00.10.CT1	1-2, 4-5, 8-9
673803-803	1.00.02.CT1 [‡]	1-9
	1.00.03.CT1 [‡]	1-9
	1.00.04.CT1 [‡]	1-5, 7-9
	1.00.05.CT1 [‡]	1-5, 8-9
	1.00.06.CT1 [‡]	1-5, 8-9
	1.00.07.CT1 [‡]	1-2, 4-5, 8-9
	1.00.08.CT1 [‡]	1-2, 4-5, 8-9
	1.00.09.CT1 [‡]	1-2, 4-5, 8-10
	1.00.10.CT1	1-2, 4-5, 8-9

[‡] 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 *AP440FX Motherboard Technical Product Specification* (Order Number 281830). All Specification Changes will be incorporated into a future version of that specification.

1. *User Password Clear Feature*

A user password clear feature has been added to allow an administrator to clear the user password in the BIOS Setup Security screen. The option for the Administrator to clear the user password is only available in BIOS Revision 1.00.07.CT1 and higher. See Documentation Change 2 for further information.

ERRATA

1. ***CS32DIAG Conflicts with CrystalWare* Audio CD Player***

PROBLEM: Many DOS audio programs, including the CS4232 audio diagnostic program, set the mixer volume levels for audio CD to zero. The original levels may not be reset to their original levels when the program is exited.

IMPLICATION: The user will not be able to hear audio CD's after running audio diagnostics until mixer volume levels are reset.

WORKAROUND: Run the Mixer Utility to restore the audio output before playing an audio CD.

STATUS: This erratum will not be fixed.

2. ***System BIOS Does Not Recognize Bootable USB Devices***

PROBLEM: The system BIOS does not recognize a USB keyboard or mouse during a system boot. A USB keyboard or mouse is not recognized until an operating system that supports USB is loaded.

IMPLICATION: 1. The user is not able to use a USB keyboard to enter the BIOS Setup or to respond to error messages that are displayed before an operating system with USB support is loaded.
2. The user is not able to use a USB keyboard or mouse with any operating system that does not have USB support.

WORKAROUND: Use a standard PS/2* style keyboard and mouse in any configuration where input is required before an operating system with USB support is loaded.

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

3. ***BIOS Does Not Support No-Emulation Mode for CD-ROM Boot***

PROBLEM: The system BIOS does not support booting from an "El Torito" bootable CD-ROM using the no-emulation mode format.

IMPLICATION: Booting from a CD-ROM using no emulation mode is not supported. For example, Microsoft Windows* NT* version 4.0 uses no-emulation mode for its boot CD-ROM.

WORKAROUND: Boot the computer from a floppy or hard disk, then install or run the program from the CD-ROM.

STATUS: This erratum was fixed in BIOS revision 1.00.07.CT1.

4. ***System May Prevent Configuration of ISA Plug and Play Add-in Cards***

PROBLEM: If the onboard parallel port is configured to use ECP mode at LPT2, an ISA Plug and Play card may not respond to configuration commands.

IMPLICATION: Some ISA Plug and Play cards will not be recognized or properly configured at system boot.

WORKAROUND: Configure the parallel port at LPT1 to use ECP mode or configure LPT2 for a mode other than ECP.

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

5. PCI Device Scan May Terminate Abnormally

PROBLEM: If the system does not contain a device with PCI ID Bus 00, Device 07, Function 3, any program that polls for PCI devices will receive a partial response at that address. If the program is not able to recover from that partial response it may cause the computer to lock up.

IMPLICATION: The user may have to reboot the computer after running a PCI diagnostic program. This is only known to affect the proprietary PCI diagnostic program PCI.EXE. Intel does not know of any application program subject to this erratum.

WORKAROUND: None

STATUS: This erratum will not be fixed.

6. CMOS Checksum May Be Lost If Power Is Cycled During Boot

PROBLEM: If the computer power is turned off during a short portion of the boot process, the CMOS checksum byte will not be updated. The next time the computer is turned on, the message "CMOS Checksum Invalid" will be displayed.

IMPLICATION: When the message is displayed, the correct checksum has already been recalculated and stored. No user action is required to recover from the error. If the additional message:

Date and Time Not Set
Press <F1> for Setup, <Esc> to Boot

is displayed, the user will have to reset the current date and time using the BIOS Setup program.

WORKAROUND: None.

STATUS: This erratum was fixed in BIOS revision 1.00.04.CT1.

7. System May Hang at Boot Due to Incorrect 60 ns Memory Timings

PROBLEM: Systems using 60 ns EDO SIMM*s may fail, resulting in no video displayed at initial power-on. The system improperly uses a default value of 38 ns for the Tcsh memory timing parameter at power-on, which may result in a hang condition.

IMPLICATION: Systems may be incompatible with 60 ns EDO SIMMs that cannot function with a Tcsh value of 38 ns.

WORKAROUND: None.

STATUS: This erratum was fixed in BIOS revision 1.00.05.CT1.

8. *Cannot Meet FCC Class B Requirements Using Unshielded USB Cable*

PROBLEM: The motherboard will generate excessive electromagnetic radiation on unshielded USB cables, even if no device or a low speed (sub-channel) USB device is attached to the cable.

IMPLICATION: Systems based on this motherboard will not meet FCC Part 15 Class B requirements when unshielded USB cable is used. Although this condition is a violation of the USB v1.0 specification, it is not believed to have any effect on normal USB device operation.

WORKAROUND: Use USB devices with shielded cable that meet the requirements for high speed (fully-rated) USB devices.

STATUS: This erratum will not be fixed.

9. *Management Extension ASIC May Fail to Reset at Power-On*

PROBLEM: If external system devices, such as monitors or printers, are already powered on at system power-on, they may provide an offset potential of greater than 200 mV DC between the Vcc power plane and the ground plane of the motherboard. This can cause an intermittent internal reset failure in the management extension ASIC used on the motherboard. If the internal reset fails, no data conversions will occur and the ASIC registers that store temperature, voltage and fan speed data will be set to zero.

IMPLICATION: If LANDesk® software or other management software attempts to query the ASIC for temperature, voltage or fan speed information, it will receive invalid data. Any system alerts based on the status of those parameters will not occur.

The monitoring of these three parameters is the only function affected by this erratum. The rest of the system will function normally in all other respects. Applications that do not use management software to monitor these hardware parameters are not affected by this erratum.

WORKAROUND: Power down the system and all external devices connected to it. While all external devices are still turned off, power the system on again. Turning off all external devices reduces the offset potential to a low value that allows the management ASIC to reset when power is turned on again.

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

10. *Onboard Audio Solution is Not Detected by BIOS*

PROBLEM: The onboard audio solution is not detected by the BIOS at boot time. This erratum is only present in BIOS version 1.00.09.CT1.

IMPLICATION: Audio drivers cannot be loaded by the operating system and the onboard audio will not function.

WORKAROUND: None

STATUS: This erratum was fixed in BIOS revision 1.00.10.CT1.

SPECIFICATION CLARIFICATIONS

The Specification Clarifications listed in this section apply to the *AP440FX Motherboard Technical Product Specification* (Order Number 281830). All Specification Clarifications will be incorporated into a future version of that specification.

1. ***Advanced Power Management (APM) Will Not Function as Expected with Universal Serial Bus (USB) Enabled***

The following will be added to Section 1.7.7, Universal Serial Bus Support and Section 3.14.8.1, Advanced Power Management:

Advanced Power Management will not function as expected when a USB keyboard or mouse is used. USB activity is not monitored by the APM event counter, therefore, activity from a USB keyboard or mouse will not keep the system awake or bring a system out of APM sleep mode. If a USB keyboard or mouse is being used, APM should be disabled.

2. ***PCI 2.1 Specification Optional Features***

The following will be added to Section 1.12.2, Memory/Expansion Connectors:

The following optional features in the PCI 2.1 Specification are not implemented on the AP440FX motherboard:

- Cache Support Pins **SBO#** and **SDONE** (Section 2.2.7)
- **PRSNTx#** (Section 2.2.8)
- **CLKRUN#** (Section 2.2.8)
- 64 Bit Bus Extension Pins (Section 2.2.9)
- 66 MHz support (Section 2.2.8)
- JTAG/Boundary scan (Section 2.2.10)

DOCUMENTATION CHANGES

The Documentation Changes listed in this section apply to the *AP440FX Motherboard Technical Product Specification* (Order Number 281830). All Documentation Changes will be incorporated into a future version of that specification.

1. **Revision of Section 1.7.1, 82441FX PCI Bridge and Memory Controller (PMC)**

The 3rd bullet in this section will be replaced in its entirety as follows:

- Fully synchronous PCI bus interface
 - 25/30/33 MHz
 - PCI to DRAM data transfers up to or greater than 100 MB/sec
 - Up to 5 PCI bus masters in addition to the PIIX3

2. **Revision of Section 3.14.12, Security Screen**

This section will be replaced in its entirety as follows:

This section describes the options that can be set to restrict access to the Setup program and to restrict who can boot the computer.

An administrative password and a user password can be set for the Setup program and for booting the computer, with the following restrictions:

- The administrative password gives unrestricted access to view and change all the Setup options in the Setup program. This is administrative mode.
- The user password gives restricted access to view and change Setup options in the Setup program. This is user mode. The level of user-mode access is set with the User Privilege Level option described below.
- If only the administrative password is set, pressing the <Enter> key at the password prompt of the Setup program allows the user restricted access to Setup. The restricted access is the level set for the User Privilege Level option.
- If both the administrative and user passwords are set, users can enter either the administrative password or the user password to access Setup. Users have access to Setup respective to which password is entered.
- Setting the user password restricts who can boot the computer. The password prompt will be displayed before the computer is booted. If only the administrative password is set, the computer boots without asking for a password. If both passwords are set, the user can enter either password to boot the computer.

Table 16 shows the effects of setting the administrative password and user password. This table is for reference only and is not displayed on the screen.

Table 16. Administrative and User Password Functions

Password Set	Administrative Mode	User Mode	Setup Options	Password to Enter Setup	Password During Boot
Neither	Can change all options *	Can change all options *	None	None	None
Administrative only	Can change all options	Can change a limited number of options **	Administrative Password User Privilege Level	Administrative	None
User only	N/A	Can change all options	Enter Password Clear User Password	User	User
Administrative and user set	Can change all options	Can change a limited number of options **	Administrative Password User Privilege Level Enter Password	Administrative or user	Administrative or user

* If no password is set, any user can change all Setup options.

** The level of user access is set with the User Privilege Level option described below.

USER PASSWORD

Reports if there is a user password set. There are no options.

ADMINISTRATIVE PASSWORD

Reports if there is an administrative password set. There are no options.

ENTER PASSWORD

Sets the user password. The password can be up to seven alphanumeric characters.

SET ADMINISTRATIVE PASSWORD

Sets the administrative password. The password can be up to seven alphanumeric characters.

USER PRIVILEGE LEVEL

Sets the level of access users can have to the Setup program. This option can be set only by an administrative user with access to the administrative password. This option is displayed only when an administrative password is set. The options are:

- Limited Access (**default**)
- No access
- View Only
- Full Access

The following table specifies the permitted access to Setup for each option:

Table 17. Access for User Privilege Level Options

Option	Access
Limited Access	User can access the Setup program and can change the following options: System Date, System Time, User Password, Unattended Start, and Security Hot-Key. Other Setup options are not visible.
No access	User cannot access the Setup program.
View Only	User can access the Setup program and view options, but cannot change any options.
Full Access	User can access the Setup program and can change all options except User Privilege Level and Set Administrative Password.

CLEAR USER PASSWORD

Clears the current user password. The user password must be set to enable this field.

UNATTENDED START

Controls when the security password is requested. The user password must be set to enable this field. The options are:

- Enabled (the system boots, but the keyboard is locked until the user password is entered)
- Disabled (the system does not boot until the user password is entered) **(default)**

SECURITY HOT KEY (CTRL-ALT-)

Sets a hot key that locks the keyboard until the user password is entered. All alphabetic keys are valid entries for this field. When a user presses this key while holding down the <Ctrl> and <Alt> keys, the keyboard locks and the keyboard LEDs flash to indicate that the keyboard is locked.

 **NOTE**

If the user sets the Security hot key and the APM hot key (see Section 3.14.9.5) to the same key, the APM function has priority.

3. Revision of Section 1.16.1, Power Supply Considerations

The following will be added to the list of requirements that a power supply must meet:

- A pull-up resistor of ~5 K Ohms connecting PS_ON# to +5 V Standby