



PR440FX Motherboard Specification Update

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Order Number: 281832-012

The PR440FX 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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REVISION HISTORY

Date of Revision	Version	Description
September 1996	-001	This document is the first Specification Update for the Intel PR440FX motherboard.
October 1996	-002	Added Specification Changes 1-4, Erratum 2, Specification Clarification 1, and Documentation Change 1.
November 1996	-003	Added Errata 3-4.
December 1996	-004	Removed Specification Changes 1-3, Specification Clarification 1 and Documentation Change 1, which were incorporated into revision -002 of the specification. Added Errata 5-8 and Specification Clarification 1. Specification Change 4 was replaced by Erratum 5.
January 1997	-005	Added Documentation Change 1. Updated status of Erratum 7.
March 1997	-006	Added AA Revision to Motherboard Identification table. Revised format of PBA/BIOS revision table. Removed Documentation Change 1. Added Documentation Changes 1-2.
April 1997	-007	Added Erratum 8. Added Documentation Change 3.
May 1997	-008	Added Documentation Change 4.
June 1997	-009	Added Errata 9-10, Specification Clarifications 2-3 and Documentation Change 5.
July 1997	-010	Added Specification Change 1, Erratum 11 and Documentation Change 6-8.
August 1997	-011	Added Specification Clarification 4 and Documentation Change 9.
November 1998	-012	Updated status of Errata 1-4, 9 and 11.

PREFACE

This document is an update to the specifications contained in the *PR440FX Motherboard Technical Product Specification* (Order Number 281829). 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* (Order Number 242689) for specification updates concerning the Pentium Pro processor. Items contained in the *Pentium Pro Processor Specification Update* that either do not apply to the PR440FX 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 PR440FX 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 PR440FX 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 PR440FX 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 PR440FX Motherboards

GENERAL INFORMATION

Basic PR440FX Motherboard Identification Information

AA Revision	PBA Revision	82440FX PCIset Stepping	BIOS Revision	Notes
657173-405	657002-405	A1	1.00.01.DI0	1, 2, 3, 4, 5
657173-502	657002-502	A1	1.00.01.DI0	1, 2, 3, 4, 5
657173-503	657002-503	A1	1.00.02.DI0	1, 2, 3, 4, 5
657173-504	657002-504	A1	1.00.02.DI0	1, 2, 3, 4, 5
657173-505	657002-505	A1	1.00.03.DI0	1, 2, 3, 4, 5
657173-506	657002-506	A1	1.00.05.DI0	1, 2, 3, 4, 5
657173-507	657002-507	A1	1.00.07.DI0	1, 2, 3, 4, 5
657173-508	657002-508	A1	1.00.07.DI0	1, 2, 3, 4, 5
657173-509	657002-509	A1	1.00.08.DI0	1, 2, 3, 4, 5
657173-510	657002-510	A1	1.00.08.DI0	1, 2, 3, 4, 5

NOTES:

1. The PBA number is found on a small label on the component side of the board.
2. 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* (Order Number 242689) for the Pentium Pro processor and either do not apply to the PR440FX motherboard or have been worked-around in this PBA and/or BIOS revision: 1, 4, 14-15, 25, 41, 50, 60 and 2AP. 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 PR440FX 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 PR440FX motherboard or have been worked around in this PBA and/or BIOS revision: 1-7. 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 PR440FX 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	NoFix	System BIOS does not recognize bootable USB devices
3	NoFix	BIOS does not support no-emulation mode for CD-ROM boot
4	NoFix	System may prevent configuration of ISA Plug and Play add-in cards
5	Fixed	BIOS revision 1.00.01 does not support IRQ routing
6	Fixed	External chassis speaker is not supported
7	Fixed	CMOS checksum may be lost if power is cycled during boot
8	NoFix	Cannot meet FCC Class B requirements using unshielded USB cable
9	Fixed	System locks up if processor thermal sensors are enabled
10	Fixed	Onboard LAN performance may degrade with short cable runs
11	NoFix	Management extension ASIC may fail to reset at power-on
NO.	PLANS	SPECIFICATION CLARIFICATIONS
1	Doc	System management mode (SMM) requires that interrupts be disabled
2	Doc	Advanced Power Management (APM) will not function as expected with Universal Serial Bus (USB) enabled
3	Doc	PCI 2.1 Specification optional features
4	Doc	Power supply considerations
NO.	PLANS	DOCUMENTATION CHANGES
1	Doc	Relocation of mounting hole on motherboard dimension figure
2	Doc	Add tables showing qualified microprocessors

NO.	PLANS	DOCUMENTATION CHANGES
3	Doc	3.5 V processors not supported
4	Doc	Add description for manufacturing jumper block
5	Doc	Corrections to jumper settings in Section 1.14.6
6	Doc	Change to instructions for the CMOS settings jumper
7	Doc	Revision of Section 3.14.15, Security Screen
8	Doc	Revision of Section 1.5.1.1, 82441FX PCI Bridge and Memory Controller (PMC)
9	Doc	Revision of Section 1.17.1, 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
657002-405	1.00.01.D10	1-11
	1.00.02.D10	1-4, 6, 11
	1.00.03.D10	1-4, 6, 8-11
	1.00.05.D10	1-4, 6, 8-11
	1.00.07.D10	1-4, 6, 8-11
	1.00.08.D10	1-4, 6, 8-11
657002-502	1.00.01.D10	1-5, 7-11
	1.00.02.D10	1-4, 8-11
	1.00.03.D10	1-4, 8-11
	1.00.05.D10	1-4, 8-11
	1.00.07.D10	1-4, 8-11
	1.00.08.D10	1-4, 8-11
657002-503	1.00.01.D10 [†]	1-5, 7-11
	1.00.02.D10	1-4, 8-11
	1.00.03.D10	1-4, 8-11
	1.00.05.D10	1-4, 8-11
	1.00.07.D10	1-4, 8-11
	1.00.08.D10	1-4, 8-11
657002-504	1.00.01.D10 [†]	1-5, 7-11
	1.00.02.D10	1-4, 8-11
	1.00.03.D10	1-4, 8-11
	1.00.05.D10	1-4, 8-11
	1.00.07.D10	1-4, 8-11
	1.00.08.D10	1-4, 8-11
657002-505	1.00.01.D10 [†]	1-5, 7-11
	1.00.02.D10 [†]	1-4, 8-11
	1.00.03.D10	1-4, 8-11
	1.00.05.D10	1-4, 8-11
	1.00.07.D10	1-4, 8-11
	1.00.08.D10	1-4, 8-11

PBA Revision	BIOS Revision	Errata That Apply to This Combination
657002-506	1.00.01.DI0 [‡]	1-5, 7-9, 11
	1.00.02.DI0 [‡]	1-4, 8-9, 11
	1.00.03.DI0 [‡]	1-4, 8-9, 11
	1.00.05.DI0	1-4, 8-9, 11
	1.00.07.DI0	1-4, 8-9, 11
	1.00.08.DI0	1-4, 8-9, 11
657002-507	1.00.01.DI0 [‡]	1-5, 7-8, 11
	1.00.02.DI0 [‡]	1-4, 8, 11
	1.00.03.DI0 [‡]	1-4, 8, 11
	1.00.05.DI0 [‡]	1-4, 8, 11
	1.00.07.DI0	1-4, 8, 11
	1.00.08.DI0	1-4, 8, 11
657002-508	1.00.01.DI0 [‡]	1-5, 7-8, 11
	1.00.02.DI0 [‡]	1-4, 8, 11
	1.00.03.DI0 [‡]	1-4, 8, 11
	1.00.05.DI0 [‡]	1-4, 8, 11
	1.00.07.DI0	1-4, 8, 11
	1.00.08.DI0	1-4, 8, 11
657002-509	1.00.01.DI0 [‡]	1-5, 7-8, 11
	1.00.02.DI0 [‡]	1-4, 8, 11
	1.00.03.DI0 [‡]	1-4, 8, 11
	1.00.05.DI0 [‡]	1-4, 8, 11
	1.00.07.DI0 [‡]	1-4, 8, 11
	1.00.08.DI0	1-4, 8, 11
657002-510	1.00.01.DI0 [‡]	1-5, 7-8, 11
	1.00.02.DI0 [‡]	1-4, 8, 11
	1.00.03.DI0 [‡]	1-4, 8, 11
	1.00.05.DI0 [‡]	1-4, 8, 11
	1.00.07.DI0 [‡]	1-4, 8, 11
	1.00.08.DI0	1-4, 8, 11

[‡] 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 *PR440FX Motherboard Technical Product Specification* (Order Number 281829). 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 1.00.05.D10 and higher. See Documentation Change 7 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 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 not be fixed.

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 in an IDE CD-ROM drive.

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 will not be fixed.

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 not be fixed.

5. BIOS Revision 1.00.01 Does Not Support IRQ Routing

PROBLEM: BIOS revision 1.00.01.D10 does not implement IRQ routing.

IMPLICATION: The user will not be able to enable or use this feature. Additional PCI IRQs mapped through the IO APIC will not be available.

WORKAROUND: None.

STATUS: This erratum was fixed in BIOS revision 1.00.02.D10. The feature has been renamed PCI IRQ Mapping.

6. External Chassis Speaker is Not Supported

PROBLEM: The external speaker connection on the motherboard cannot be used.

IMPLICATION: The user will not be able to use an external chassis speaker.

WORKAROUND: Use the internal speaker on the motherboard.

STATUS: This erratum was fixed in PBA revision 657002-502.

7. 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 1.00.02.D10.

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. System Locks Up if Processor Thermal Sensors are Enabled

PROBLEM: If the processor thermal sensors are enabled on a motherboard with audio, crosstalk on the signal lines that monitor these thermal sensors will cause the system to lock up.

IMPLICATIONS: The processor thermal sensors on the board cannot be used when onboard audio is enabled.

WORKAROUND: Contact your manageability software provider to determine if the thermal sensor is enabled and how to disable it. Onboard audio can be disabled using the Audio Interface option of the Advanced Chipset Configuration menu in the BIOS Setup program.

STATUS: This erratum was fixed in PBA revision 657002-507.

10. Onboard LAN Performance May Degrade with Short Cable Runs

PROBLEM: Attenuating resistors in the onboard LAN circuitry may cause the autofiltering section of that circuit to miscalculate the length of very short cables. The resulting overcompensation for cable length may cause noise at high frequencies that can lead to a loss of network performance.

IMPLICATION: Systems connecting to the LAN with cable lengths of less than 10 meters may experience network performance degradation.

WORKAROUND: Use a cable length of at least ten meters from the system to the network connection.

STATUS: This erratum was fixed in PBA revision 657002-506.

11. 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 not be fixed.

SPECIFICATION CLARIFICATIONS

The Specification Clarifications listed in this section apply to the *PR440FX Motherboard Technical Product Specification* (Order Number 281829). All Specification Clarifications will be incorporated into a future version of that specification.

1. ***Enabling Interrupts in System Management Mode (SMM)***

Section 3.9, Advanced Power Management, describes the use of System Management Mode by the BIOS.

System Management Mode uses its own address space. The pointers to interrupt service routines in protected mode do not necessarily point to executable interrupt service routines when the processor goes into SMM. Interrupts are disabled upon entry to SMM. Any program that wants to use interrupts during SMM must provide a valid interrupt service routine and place a pointer to it in an interrupt descriptor table before reenabling interrupts.

When the Microsoft Windows* 95 operating system places an Energy Star compliant monitor in video standby mode after a period of system inactivity, it uses the motherboard BIOS to put the processor into System Management Mode. The motherboard BIOS in turn invokes the video BIOS to place the monitor into standby mode. Some video BIOSes reenable interrupts when they are called but do not ensure that a valid interrupt service routine is available. If the video BIOS then generates a hardware or software interrupt while the system is in SMM, in most cases the system will lock up.

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

The following will be added to Section 1.5.3, Universal Serial Bus Support and Section 3.9, 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.

3. ***PCI 2.1 Specification Optional Features***

The following will be added to Section 1.11.8, PCI Connectors:

The following optional features in the PCI 2.1 Specification are not implemented on the PR440FX 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)

4. *Power Supply Considerations*

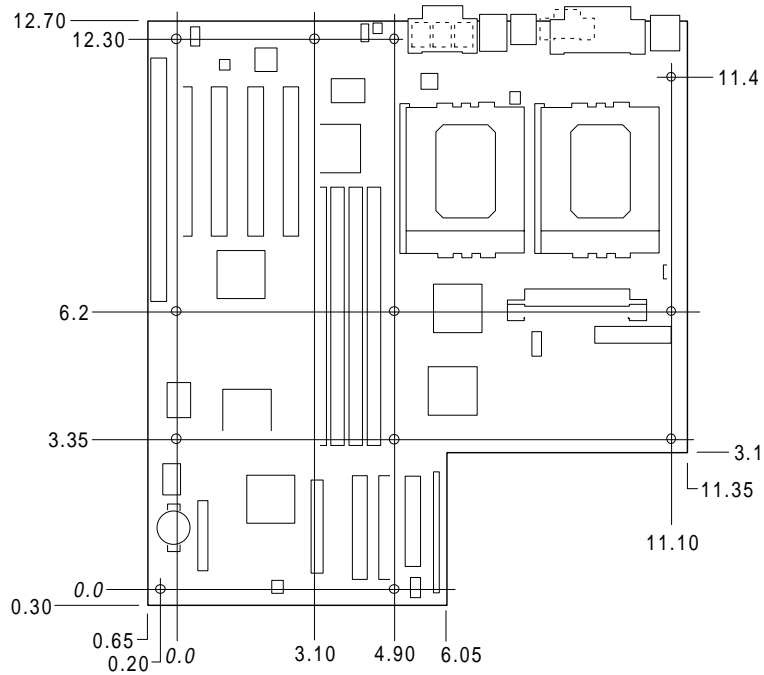
The PR440FX motherboard has been designed to be configured in a system that uses a power supply that complies with the recommendations of ATX Specification Version 2.01. See Documentation Change 9 for the specific recommendations that must be met by a power supply for the motherboard.

DOCUMENTATION CHANGES

The Documentation Changes listed in this section apply to the *PR440FX Motherboard Technical Product Specification* (Order Number 281829). All Documentation Changes will be incorporated into a future version of that specification.

1. *Relocation of Mounting Hole on Motherboard Dimension Figure*

Figure 2, Motherboard Dimensions, will be replaced with the following figure:



OM05971

2. *Add Tables Showing Qualified Microprocessors*

Section 1.3.2, Microprocessor Upgrades, will be replaced in its entirety as follows. Following tables will be renumbered as necessary.

MICROPROCESSOR UPGRADES

Two microprocessor upgrades are available:

- Single to dual processors

- Upgrade from 180 MHz Pentium® Pro processor to 200 MHz Pentium Pro processor



CAUTION

The second processor must be the same speed and second-level cache size as the primary processor. The second processor must also be the same stepping as, or no more than one stepping higher or lower than, the primary processor.

Table 1 shows the processors steppings that have been qualified with the PR440FX motherboard:

Table 1. Qualified Processor Steppings

Speed/Cache Size	Qualified Steppings		
	S-Spec	Manufacturing Stepping	Cache Stepping
180/256	SY031	sA1	β
	SY039	sA1	α
200/256	SY032	sA1	β
	SY040	sA1	β
	SL22T	sB1	β
	SL22V	sB1	β
200/512	SY048	sA1	β

In Table 2, only the combinations of Primary and Secondary processors marked Yes are qualified for use in dual processor PR440FX motherboards.

Table 2. Combinations of Primary and Secondary Processors

Speed/Cache Size	Primary Processor	Secondary Processor						
		SY031	SY039	SY032	SY040	SL22T	SL22V	SY048
180/256	SY031	Yes	Yes					
	SY039	Yes	Yes					
200/256	SY032			Yes	Yes	Yes	Yes	
	SY040			Yes	Yes	Yes	Yes	
	SL22T			Yes	Yes	Yes	Yes	
	SL22V			Yes	Yes	Yes	Yes	
200/512	SY048							Yes

3. 3.5 V Processors Not Supported

The PR440FX motherboard does not provide the voltage regulation necessary to support Pentium® Pro processors that require Vcc of 3.5V ± 5%.

The voltage requirement of a Pentium Pro processor is found in the column headed Vcc of the table **Basic 150-, 166-, 180-, and 200-Mhz Pentium Pro Processor Identification Information** in the *Pentium Pro Processor Specification Update* (Order Number 242689).

4. Add Description for Manufacturing Jumper Block

The following will be added as Section 1.14.7, Manufacturing Jumper:

The jumper at J10L1 is used for manufacturing only. Its position has no effect on normal operation. This jumper is not found on all PBA revisions.

5. Corrections to Jumper Settings in Section 1.14.6

The following changes will be made to Section 1.14.6:

The title will be changed to read: DIMM Speed (J12B2-M)

The caution will be changed to read: The jumper on pins 5-6 (block J12B2-M) is reserved. Do not change it.

6. Change to Instructions for the CMOS Settings Jumper

Section 1.14.3, CMOS Settings Jumper, will be replaced in its entirety as follows:

CMOS SETTINGS (J12B1-C)

You can reset the CMOS RAM to default values by moving the jumper from the down position to the up position and turning the system on. To restore normal operation, wait until the system reports "NVRAM cleared by jumper," then turn the system off, and return the jumper to the down position. Default is the down position (keep).

Caution: This procedure should only be done if, after a BIOS update, the system does not boot to a point where Setup can be entered or if, after CMOS default settings have been restored from within the Setup program, the system does not boot to the operating system.

7. Revision of Section 3.14.15, 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.

8. Revision of Section 1.5.1.1, 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

9. Revision of Section 1.17.1, Power Supply Considerations

Section 1.17.1, Power Supply Considerations, will be replaced in its entirety as follows:

For typical configurations, the motherboard is designed to operate with at least a 200 W power supply that complies with version 2.01 of the ATX Specification. A higher-wattage power supply should be used for heavily-loaded configurations. The power supply must comply with the following recommendations found in the indicated sections of that specification:

- The potential relation between 3.3VDC and +5VDC power rails (Section 4.2)
- The current capability of the +5VSB line (Section 4.2.1.2)
- All timing parameters (Section 4.2.1.3)
- All voltage tolerances (Section 4.2.2)

