AT and Baby AT Form Factors

AT Form Factor	*Baby AT Form Factor*
Used on older motherboards Difficult to install, service, and upgrade Uses two power connectors: P8 and P9 Problematic position of CPU in relation to expansion slots No longer produced by most manufacturers	Industry standard from 1993-1997 Small; fits into many types of cases Problematic position of CPU unresolved Drives/devices not close to connections on motherboard

AT Motherboard

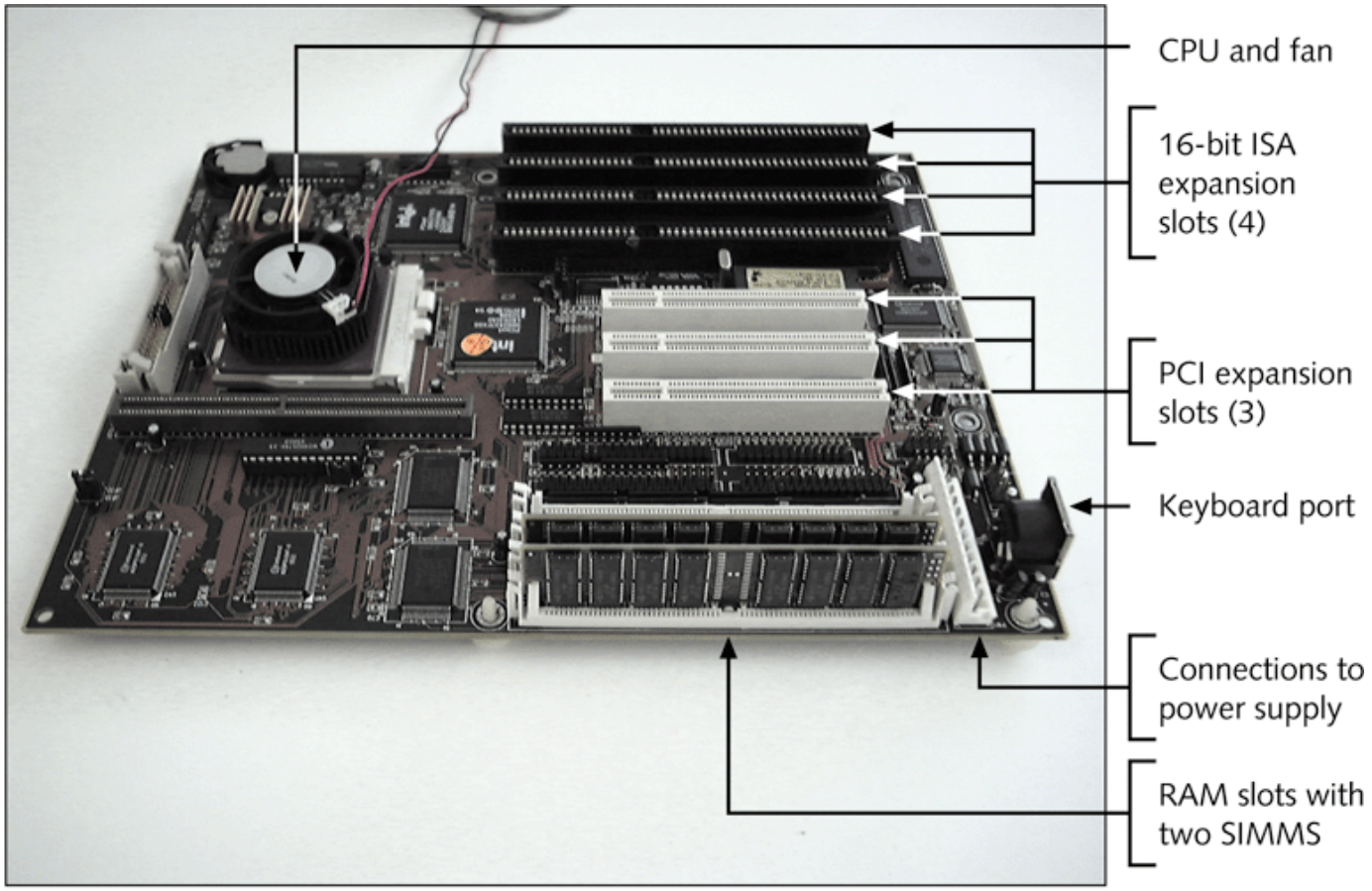


Figure 4-10 The CPU on the AT motherboard sits in front of the expansion slots

Power Connectors on AT and ATX Boards

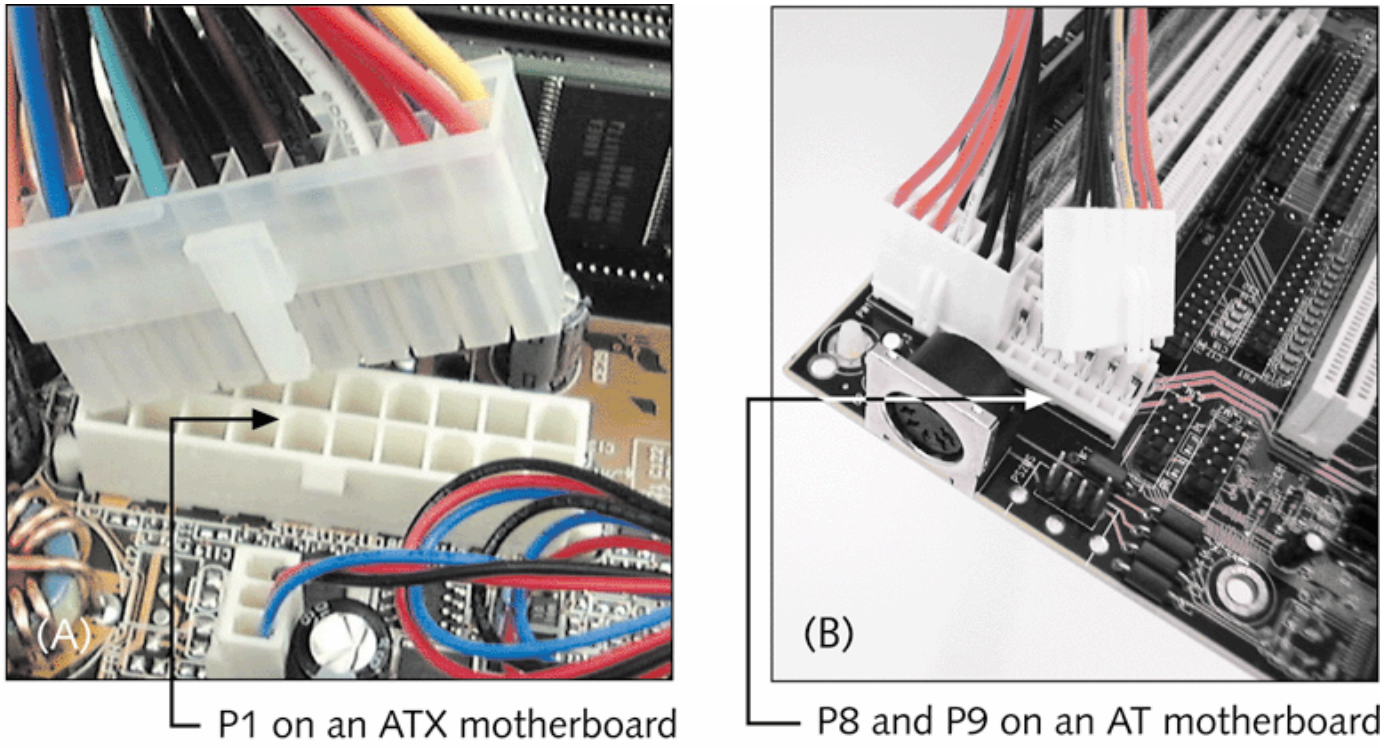


Figure 4-11 ATX uses a single P1 power connector (A), but AT-type motherboards use P8 and P9 power connectors (B)

ATX Form Factor

Open, nonproprietary spec (Intel 1995)

Easier to add and remove components

Greater support for I/O devices and processor technology

Lower costs

Improved positioning of components

ATX Form Factor (continued)

Smaller

Uses one power connector: P1

Soft switch feature

Better air circulation

Other types: Mini-ATX, MicroATX, FlexATX

ATX Motherboard

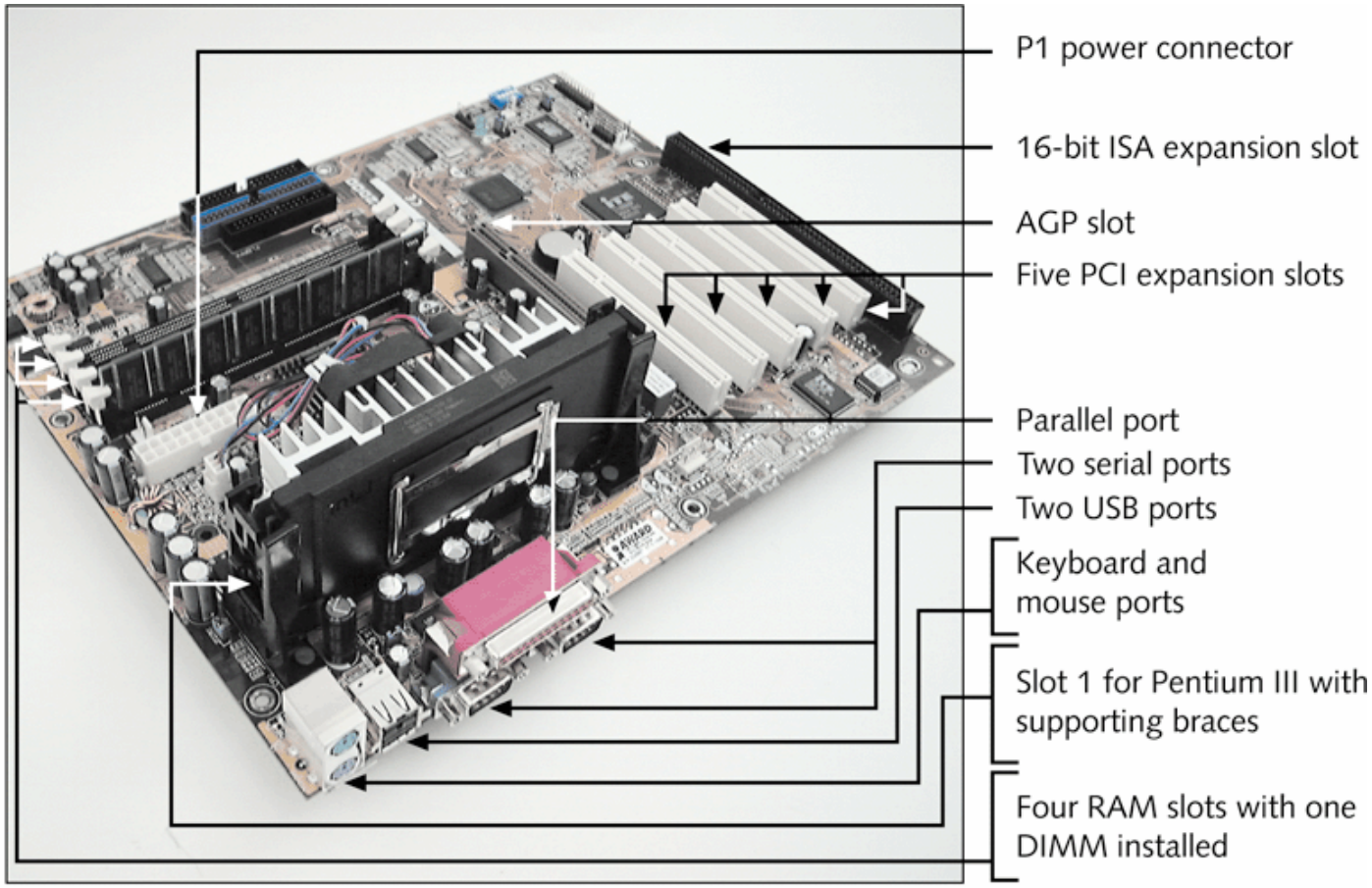


Figure 4-12 The CPU on an ATX motherboard sits beside the expansion slots and does not block the room needed for long expansion cards

NLX Form Factor

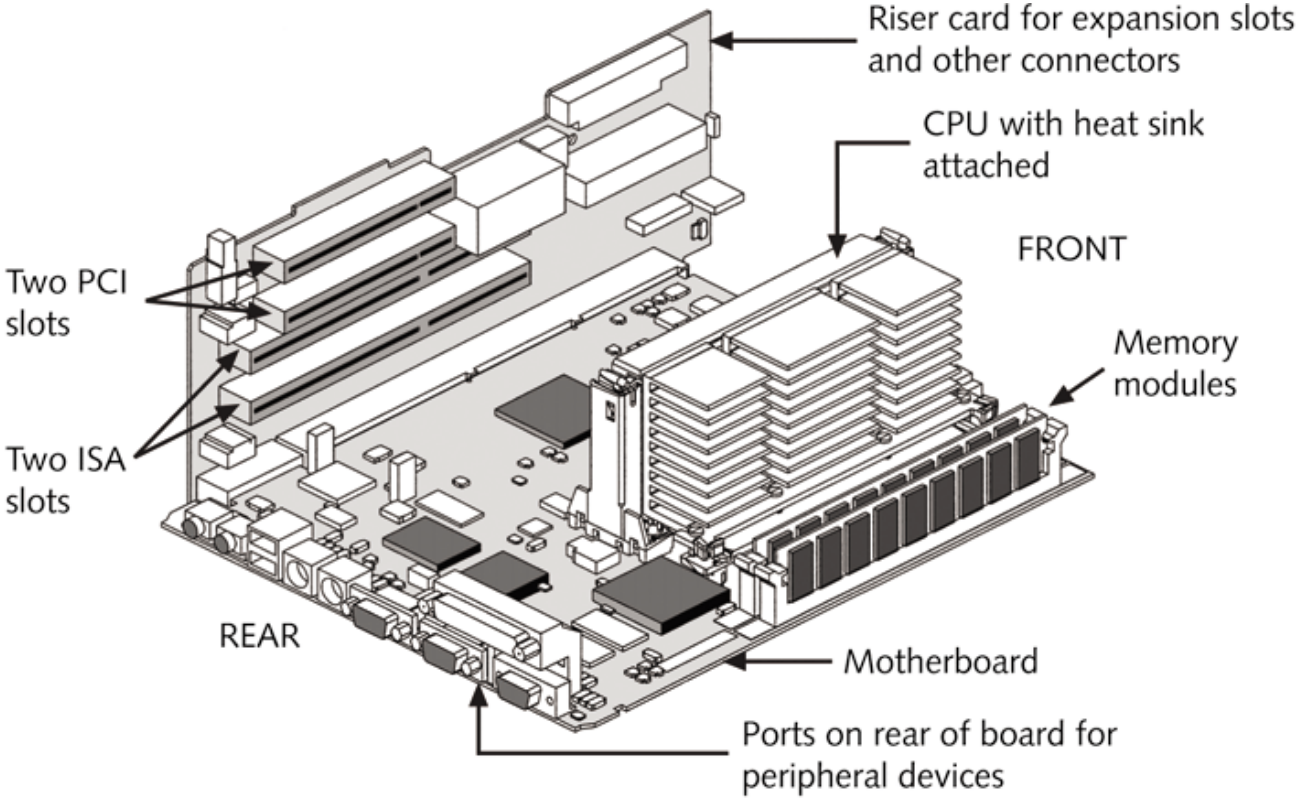


Figure 4-13 The NLX form factor uses a riser card that connects to the motherboard. The riser card provides expansion slots for the expansion cards.

Other Form Factors

LPX and Mini-LPX	*Backplane Systems*
Riser card similar to NLX systems Used in low-cost systems Difficult to upgrade Cannot handle size and operating temperature of processors Proprietary issues	Not a true motherboard; board sits against back of proprietary case with slots for other cards Active backplanes Passive backplanes

Types of Cases

- Desktop cases
- Tower cases
  - Minitower
  - Midsize tower
  - Full-size tower
- Notebook cases

Desktop Case

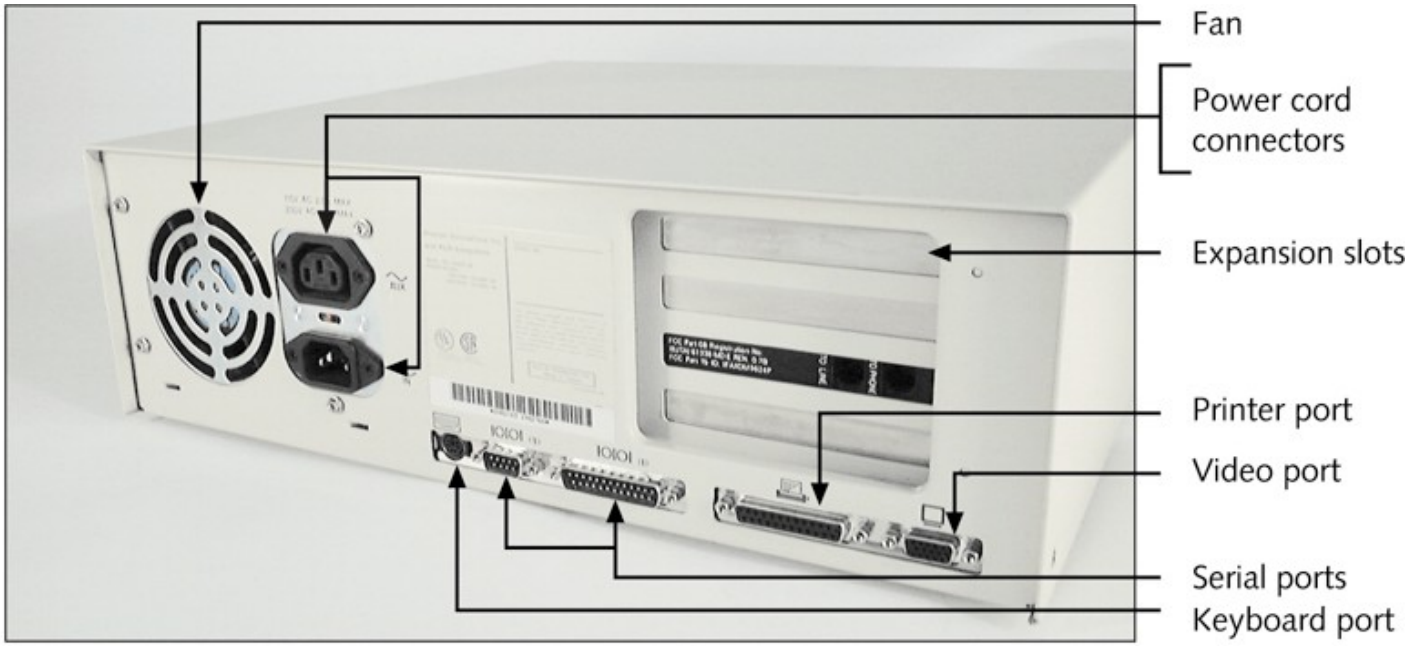


Figure 4-14 Because the expansion slots are running parallel to the motherboard on the bottom of this desktop case, you know a riser card is used

Tower Case

Figure 4-15 Minitower for Baby AT or full ATX motherboard

Tower and Desktop Cases

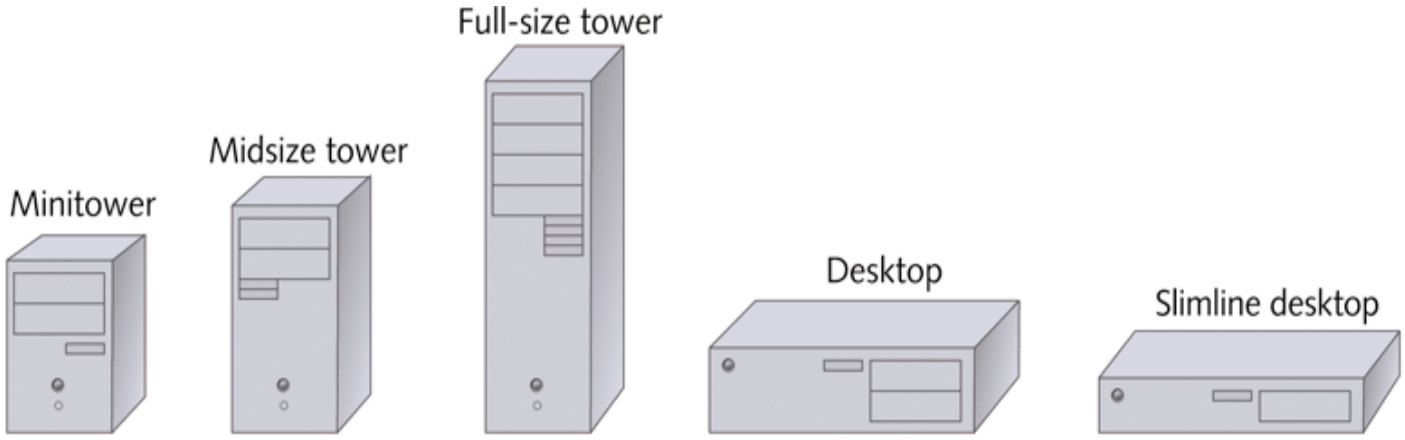


Figure 4-16 Tower and desktop cases

Introduction to Troubleshooting

Isolate the problem

- Problems that prevent PC from booting
- Problems that occur after a successful boot

Learn as much as you can by asking questions of user(s)

PC Problem Solving

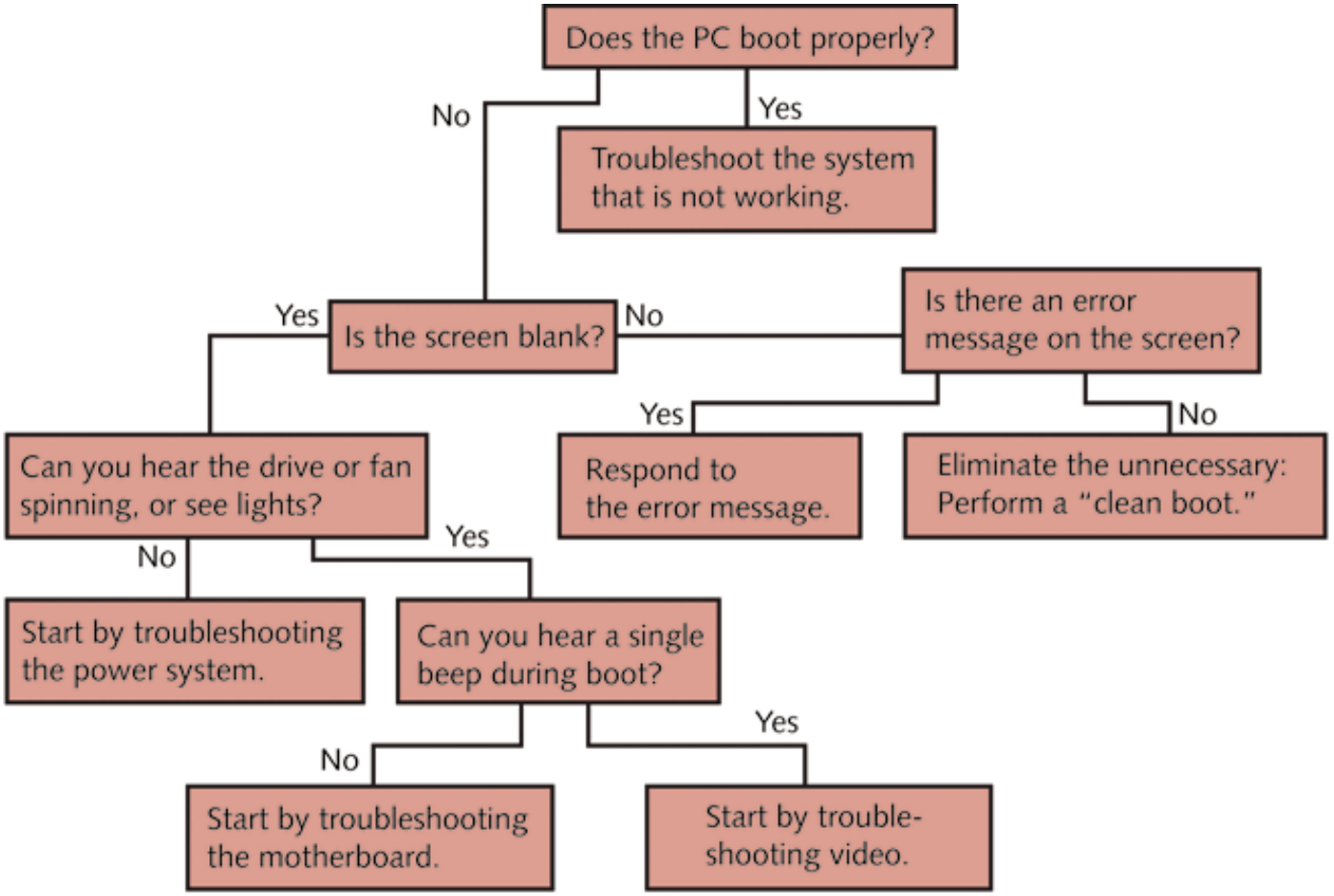


Figure 4-17 Begin PC problem solving by asking the question, "Does the PC boot properly?"

Troubleshooting the Power System: General Guidelines

Any burnt parts or odors?

Everything connected and turned on? Loose cable connections? Computer plugged in?

All switches turned on? Wall outlet good?

If fan is not running, turn off computer: Connections to power supply secure? Cards securely seated?

Troubleshooting the Power System: General Guidelines (continued)

Check for correct wire connections to motherboard

Remove nonessential expansion cards one at a time

Vacuum entire unit

Troubleshooting an ATX Power Supply

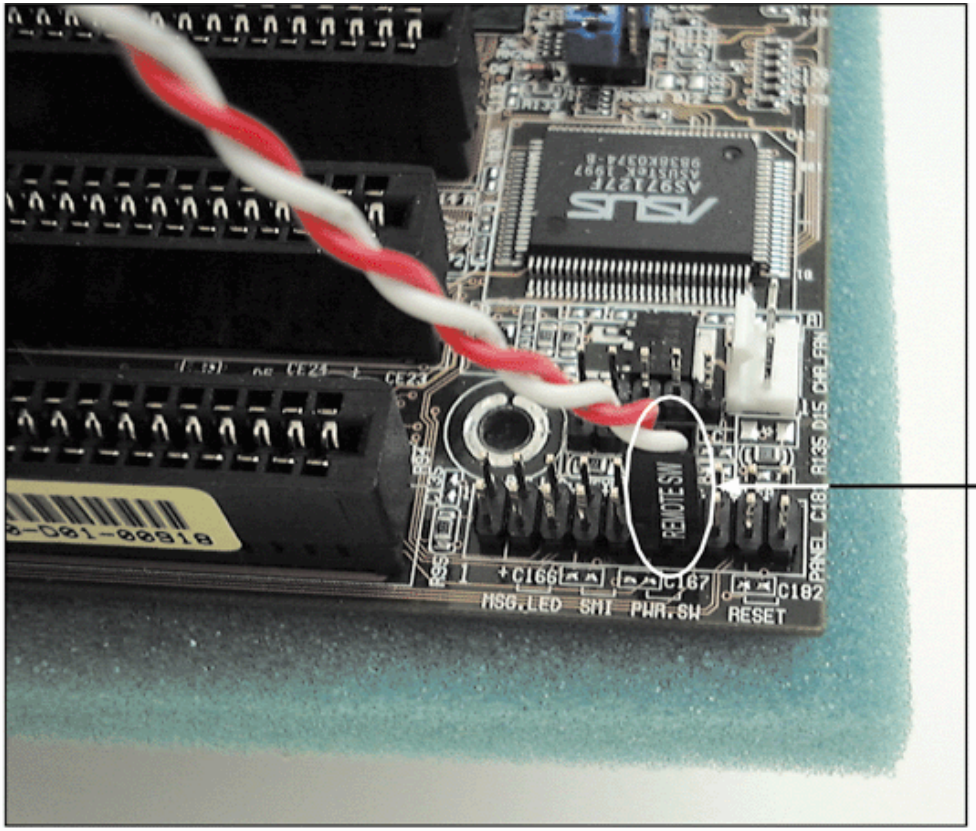


Figure 4-18 For an ATX power supply, the remote switch wire must be connected to the motherboard before power will come on

Troubleshooting the Power System

Power supply itself

Power supply fan

Power problems with the motherboard

Overheating

Preventing Overheating

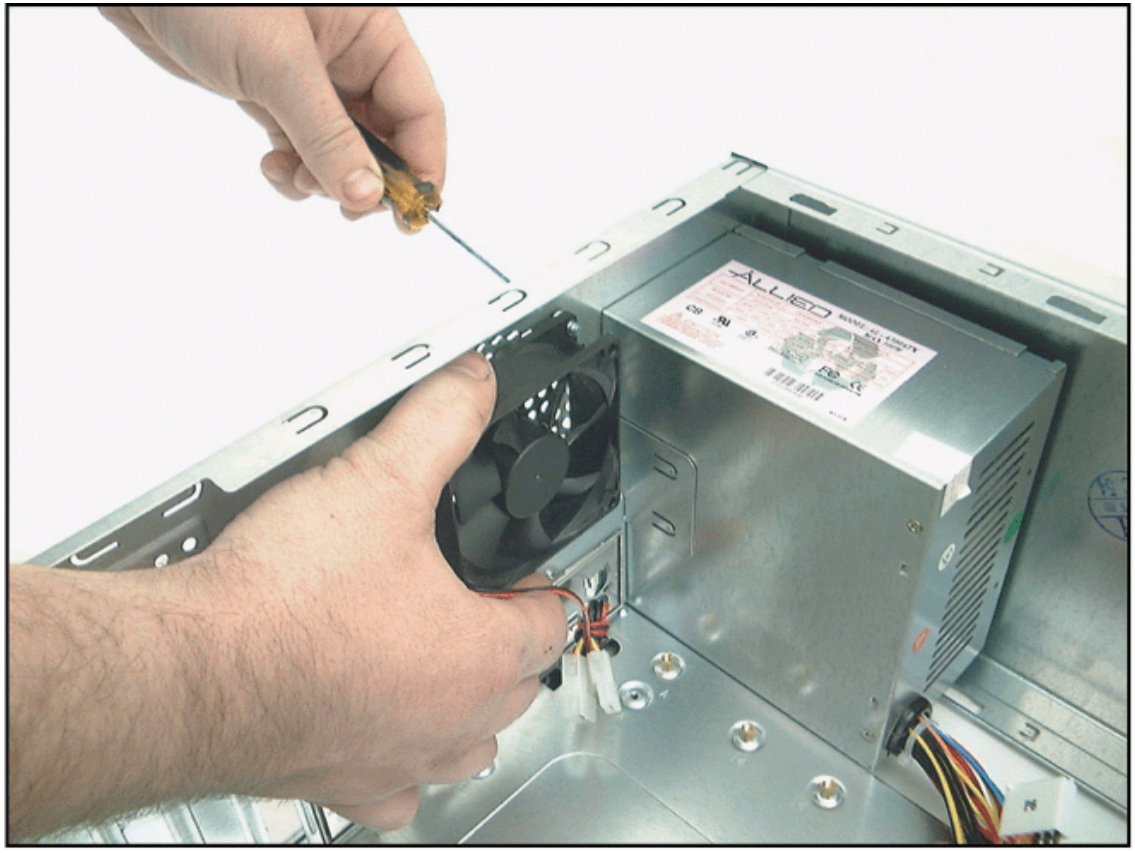


Figure 4-19 Install one exhaust fan on the rear of the case to help pull air through the case

Preventing Overheating (continued)

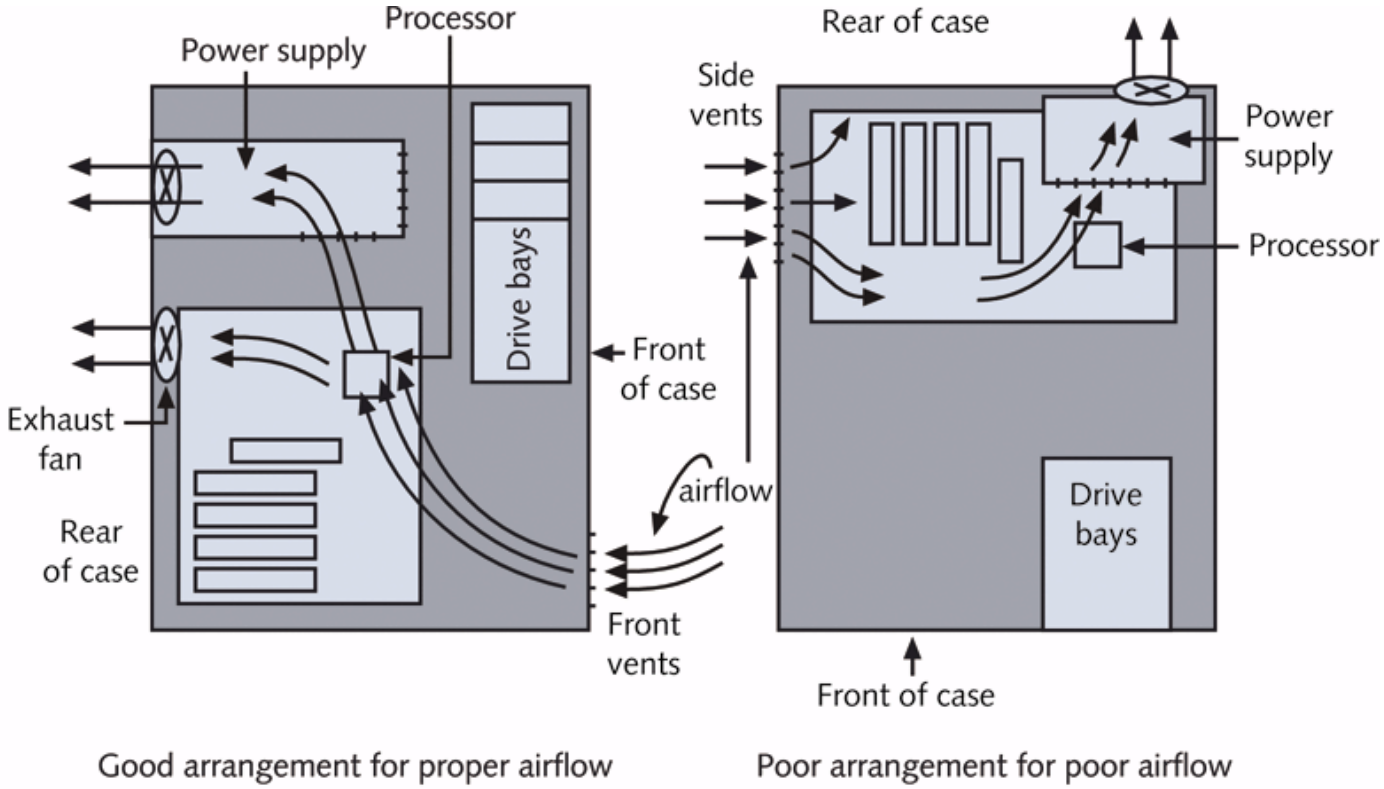


Figure 4-20 Vents and fans need to be arranged for best airflow

Power Management Methods

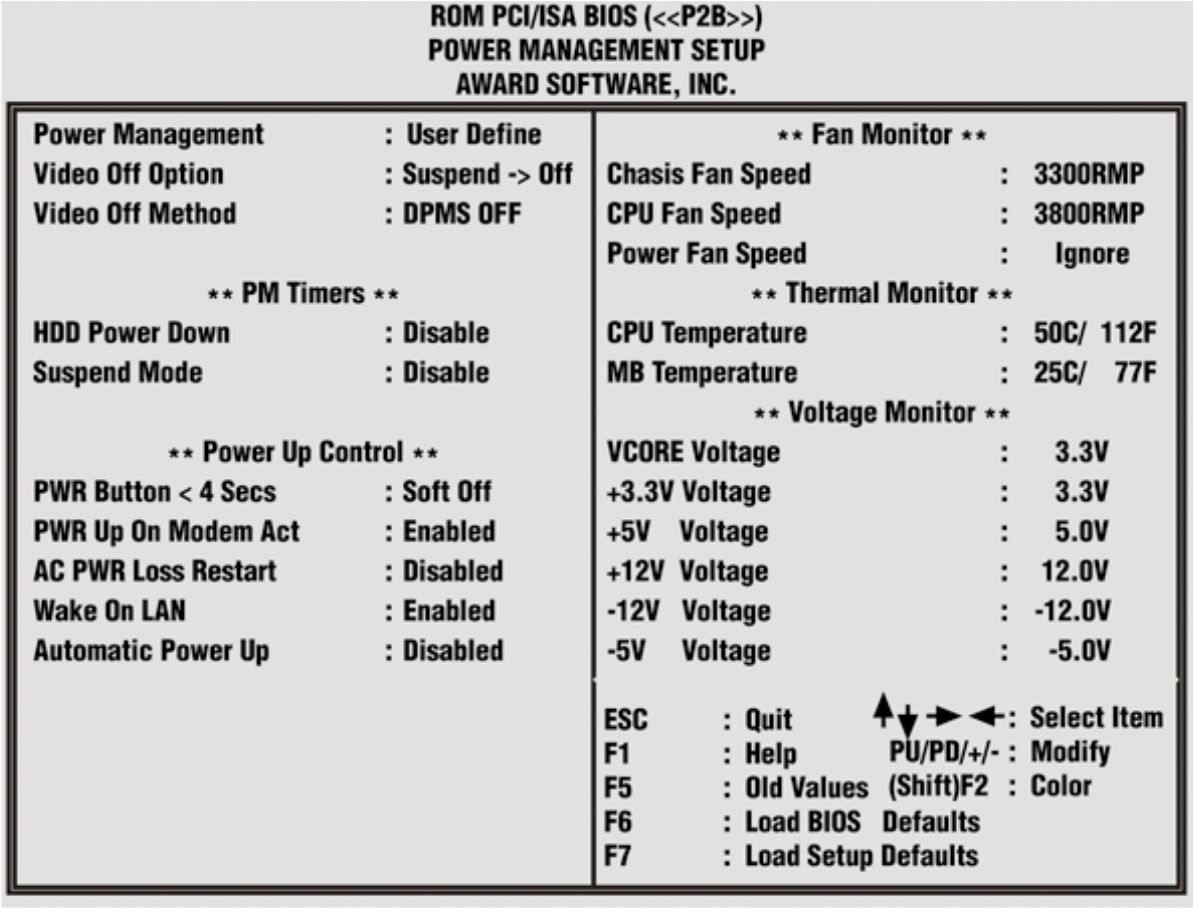
Advanced Power Management (APM)

AT Attachment (ATA) for IDE drives

Display Power Management Signaling (DPMS) standards for monitors and video cards

Advanced Configuration and Power Interface (ACPI)

Power Management Setup Screen



ROM PCI/ISA BIOS (<<P2B>>)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management	: User Define	** Fan Monitor **	
Video Off Option	: Suspend -> Off	Chasis Fan Speed	: 3300RMP
Video Off Method	: DPMS OFF	CPU Fan Speed	: 3800RMP
		Power Fan Speed	: Ignore
** PM Timers **		** Thermal Monitor **	
HDD Power Down	: Disable	CPU Temperature	: 50C/ 112F
Suspend Mode	: Disable	MB Temperature	: 25C/ 77F
		** Voltage Monitor **	
** Power Up Control **		VCORE Voltage	: 3.3V
PWR Button < 4 Secs	: Soft Off	+3.3V Voltage	: 3.3V
PWR Up On Modem Act	: Enabled	+5V Voltage	: 5.0V
AC PWR Loss Restart	: Disabled	+12V Voltage	: 12.0V
Wake On LAN	: Enabled	-12V Voltage	: -12.0V
Automatic Power Up	: Disabled	-5V Voltage	: -5.0V

ESC	: Quit	↑↓→←:	Select Item
F1	: Help	PU/PD/+/-	: Modify
F5	: Old Values	(Shift)F2	: Color
F6	: Load BIOS Defaults		
F7	: Load Setup Defaults		

Figure 4-22 A Power Management Setup screen showing power management features

Changing Power Options

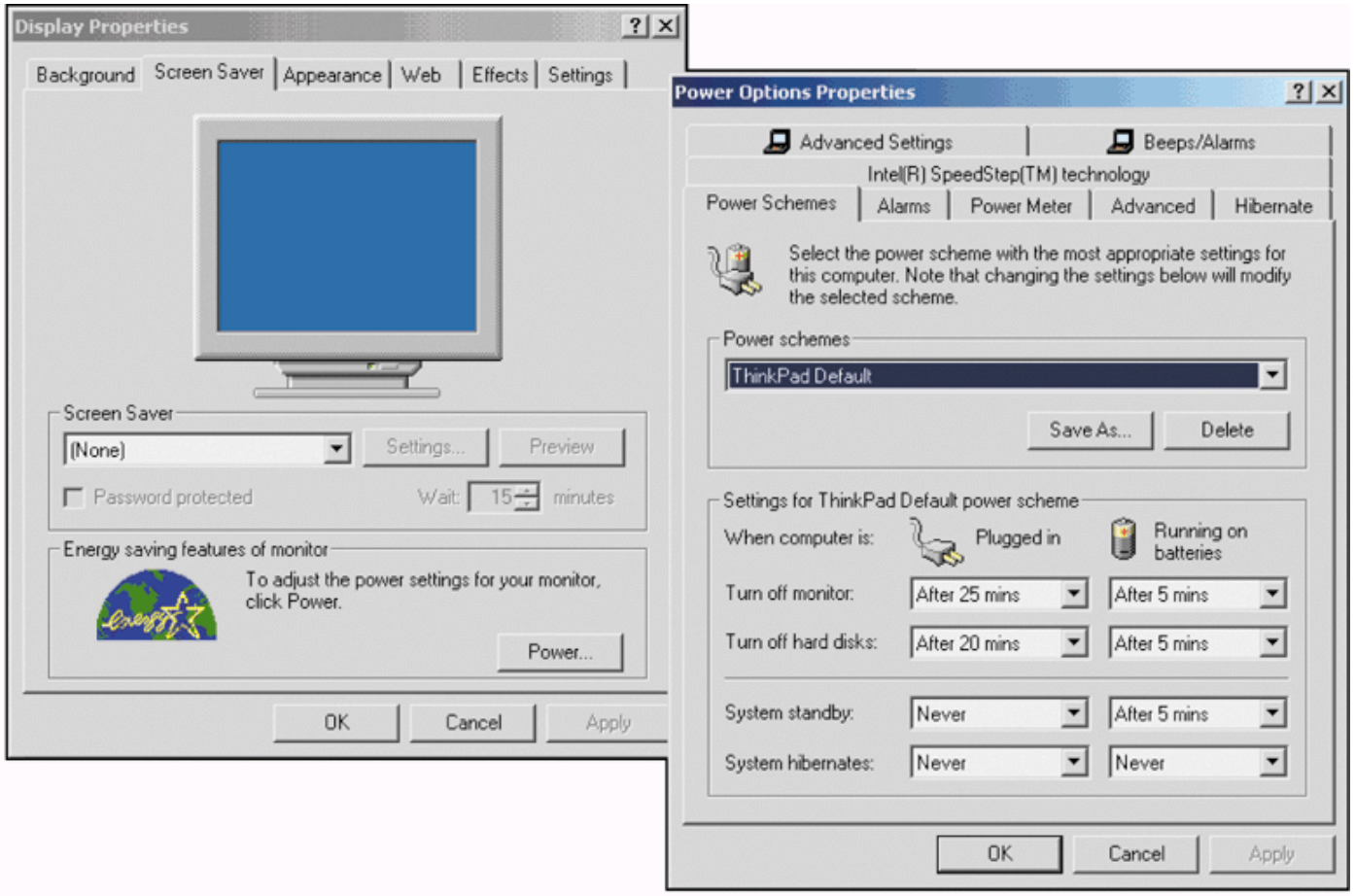


Figure 4-23 Changing power options in Windows 2000