

# FAT FAQs

Computing McGraw-Hill

*Stephen J.  
Bigelow*

# PC Hardware

*Troubleshooting, Upgrading,  
Maintaining, and Repairing*

WEB ENHANCED

# **PC Hardware FAT FAQs**

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**Stephen J. Bigelow**

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# Preface

## Your Questions Answered

No matter how many classes you take, or how many books you read, it always seems like there are questions unanswered. Ever since I started writing, I've been answering questions about all aspects of the personal computer. Folks have asked me to explain just about everything from the inner workings of a CPU to how to solve the toughest troubleshooting nightmares. In all that time, one thing has become clear: there is *no* end of questions when it comes to PCs. As the computer industry continues to evolve by leaps and bounds, there are ever-more questions that need answering.

This book has allowed me to share many of those questions and answers with you. As you read, you'll notice that many answers are up-to-the-minute, and a few can date back several years, but *all* address the most important recurring problems and issues that you've had to grapple with. So whether you fix PCs for a living or just like to tinker in your spare time, you're bound to find a wealth of useful information in the following chapters. So, you have a question of your own? Good. Send it to me:

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# Introduction

## Going Farther

Before you get started with the book, there are two things I need to cover. First, I've compiled a list of "computing rules" that you should follow. You might call these "computing commandments"; if you follow these rules, your experiences with personal computers should be a lot less stressful. Second, you're going to have many more questions of your own (it's inevitable). Today, the Internet offers a number of useful forums for computer-related questions, so I've also put together a list of news groups (Table I-1) that deal with all manner of PC topics.

### BIGELOW'S TIPS FOR TROUBLE-FREE COMPUTING

*Drivers are important.* Driver problems account for many problems when a PC is upgraded or optimized. Many of the drives, video boards, and other devices in our PCs are *heavily* dependant on drivers, which are relatively small programs that simply tell the operating system how to talk to hardware that is not supported by BIOS. The driver must be the latest version. It must be the proper mode for your operating system (real mode for DOS and Windows 3.1x; protected mode for Windows 95); it must be installed correctly; and it must not conflict with other device drivers loaded in the system.

*Go easy on your power supply.* Every device and circuit in your PC consumes power, and that power is provided by the power supply. If your PC is demanding more from the supply than it can provide, you may see erratic system behavior or crashes. You may even damage the power supply itself. For small desktop systems with a hard drive, floppy drive, and CD-ROM, a 200 W supply is adequate. Larger desktop and mini-tower systems with several hard drives, one or more CD-ROMs, and other drives like tape drives will typically run 250 W or more. Large tower systems with many drives, lots of memory, and a number of expansion boards will often use 300-W supplies or larger.

*Careful with your cabling.* It is common for drive cabling to be “unkeyed.” This allows for cables to be inserted backward (actually upside-down). While rarely harmful to the drive, it can be a real nuisance during upgrades or repairs. When inserting cable connectors, always look for the faint red or blue stripe along one side of the cable; this always designates the location of pin 1. Make sure that the “pin 1” side of your cable is aligned with pin 1 on your signal connectors.

*Check your BIOS versions.* Sooner or later you’re going to need to know your BIOS version. In many cases, this is because you want to perform a BIOS upgrade, and you need to know the current version first. In other cases, you’ll find that your BIOS is buggy or won’t support some “latest and greatest” device, and you’ll need the BIOS version to identify whether your system is afflicted. You can find the current BIOS version in your display during the first few moments after the system powers up. That’s not much time, but it should be enough to jot down the version number. Remember, *never ever* update your BIOS with a version that is not intended for your specific motherboard!

*Record your CMOS setup.* The CMOS is often the most misunderstood and neglected part of a PC, yet the CMOS RAM contains information that is absolutely vital to the proper startup and operation of your system. Make it a point to record the contents of your CMOS setup. You can do this simply by entering your CMOS Setup routine and taking <PrintScreen> captures of each setup page and printing them out to any local printer. This creates a “hard copy” of your CMOS Setup that you can refer to in the event that your CMOS RAM contents are lost. Remember to keep those screen captures with your system documentation, and take new <PrintScreen> captures whenever you make changes to the CMOS Setup.

*Check for viruses.* Computer viruses are a fact of life, and with expansive online resources like the Internet, it is easier than ever for viruses to proliferate. Run your virus checker regularly, keep the virus-checking utility current, and always remember to scan newly downloaded programs before running them for the first time.

*Keep your boot disk current.* We never realize just how much we rely on a hard drive until it fails. When a hard drive goes down, you still must boot the system to have any hope at all of recovering your data; the only way to accomplish this is with a working boot disk. Not only should the boot disk just start the PC, but it should also contain all of

the real-mode drivers needed to configure your system for DOS (namely your CD-ROM). Keep a boot disk handy, and update it whenever you add or upgrade system hardware.

*Backup, Backup, Backup.* It is said that “an ounce of prevention is worth a pound of cure,” and this wisdom is certainly not lost on the PC. File recovery techniques are notoriously limited, and only a complete and current copy of your work may save the day if your hard drive fails totally. It doesn’t really matter whether you use a tape drive, large removable media drive (like an Iomega Jaz drive), or second hard drive as a backup, so long as you *have* a backup. Remember to keep your backup current.

*Invest in Storage.* RAM and hard drive space are two resources that we never seem to have enough of. When you’re planning a new system purchase, or considering an upgrade, get as much of both as you can afford—the investment will always pay you dividends later on.

**TABLE 1.1 PC NEWS GROUPS**

For Questions on	Post the Message to
Acer users and support	alt.sys.pc-clone.acer
CD-ROM drives	comp.sys.ibm.pc.hardware.cd-rom
Chips, RAM and cache	comp.sys.ibm.pc.hardware.chips
Dell users and support	alt.sys.pc-clone.dell
Gateway users and support	alt.sys.pc-clone.gateway2000
Hardware for sale	misc.forsale.computers.discussion
Home-built PCs	alt.comp.hardware.pc-homebuilt
Laptops and notebooks	comp.sys.laptops
Magnetic drives	comp.sys.ibm.pc.hardware.storage
Memory for sale	misc.forsale.computers.memory
Micron users and support	alt.sys.pc-clone.micron
Modems	comp.sys.ibm.pc.hardware. comm comp.dcom.modems

TABLE I.1 PC NEWS GROUPS (CONTINUED)

For Questions on	Post the Message to
Monitors and video cards	comp.sys.ibm.pc.hardware.video
Networking, hardware	comp.sys.ibm.pc.hardware.net- working
Networking, networks	comp.os.netware.* (where * is, announce, connectivity, misc, or security) comp.dcom.lans.* (where * is, ethernet, fddi, misc, or token-ring) comp.protocols.tcp-ip.ibm comp.os.os2.networking.misc comp.os.os2.networking.tcp-ip comp.os.ms-windows.networking.* (where * equals misc, ras, tcp-ip, or windows)
Networking, NSF-based	comp.protocols.nfs
Networking, SMB-based	comp.protocols.smb
Palmtops	comp.sys.palmtops
PCMCIA devices	alt.periphs.pcmcia
PC-specific for sale	misc.forsale.computers.pc-specific.* (where * equals audio, cards.misc, cards.video, misc, motherboards, portables, software, or systems)
Printers	comp.periphs.printers
SCSI devices	comp.periphs.scsi
Servers	comp.dcom.servers
Sound card topics	comp.sys.ibm.pc.soundcard.tech comp.sys.ibm.pc.soundcard. advocacy comp.sys.ibm.pc.soundcard.games comp.sys.ibm.pc.soundcard.music comp.sys.ibm.pc.soundcard.misc



TABLE I.1 PC NEWS GROUPS (CONTINUED)

For Questions on	Post the Message to
Other for sale	misc.forsale.computers.other.* (where * equals misc, software, or systems)
Other hardware questions	comp.sys.ibm.pc.hardware.misc
Other peripherals	comp.periphs
Vendors and specific systems	comp.sys.ibm.pc.hardware.systems
Zenith users and support	comp.sys.zenith
Zeos users and support	alt.sys.pc-clone.zeos

# Contents

Preface: Your Questions Answered . . . . .	xi
Introduction: Going Farther . . . . .	xiii

## **Chapter 1: System Questions . . . . . 1**

Terminology and General Topics . . . . .	2
Start-up and Performance . . . . .	28
Controller Issues . . . . .	44
Crash and Lock-up Troubleshooting Issues . . . . .	55
Power Supplies and Backups . . . . .	73
SCSI Terminology and General Topics . . . . .	84
SCSI Corrective Actions . . . . .	95

## **Chapter 2: Video Questions . . . . . 105**

Video Boards . . . . .	106
PC/TV and Video Capture . . . . .	122
Monitors . . . . .	131

## **Chapter 3: Drive Questions . . . . . 161**

Floppy Drive Terminology and General Topics . . . . .	162
Floppy Drive Corrective Actions . . . . .	166
Hard Drive Terminology and General Topics . . . . .	220
Drive Enhancement Software . . . . .	242
Hard Drive Corrective Actions . . . . .	249
CD-ROM Terminology and General Topics . . . . .	269
CD-ROM Corrective Actions . . . . .	284

Tape Drive Issues .....	302
Other Drives and Drive Issues .....	308
<b>Chapter 4: Communication Questions .....</b>	<b>311</b>
On-line Issues .....	312
Modem Terminology and General Topics .....	322
Modem Corrective Actions .....	328
Serial Ports/UARTS .....	343
<b>Chapter 5: Motherboard Questions .....</b>	<b>347</b>
BIOS and Chips .....	348
Busses and Bus Mastering .....	359
Implementation Issues .....	364
Memory Issues .....	374
<b>Chapter 6: Sound Questions .....</b>	<b>405</b>
Software and Driver Issues .....	406
Hardware Terminology and General Topics .....	409
Hardware Corrective Actions .....	415
<b>Chapter 7: Input Devices .....</b>	<b>427</b>
Keyboard Issues .....	428
Mouse Issues .....	435
Joystick Issues .....	444
<b>Chapter 8: Installation and Upgrade Questions ....</b>	<b>449</b>
General Topics .....	450
CPU and Motherboard Upgrades .....	464
Extra Drives .....	491

New Video Systems .....	514
More Memory (RAM) .....	518
Modems .....	533
<b>Chapter 9: Configuration and CMOS Questions .....</b>	<b>537</b>
Keeping Time .....	538
CMOS RAM Issues .....	541
<b>Chapter 10: Windows 95 Questions .....</b>	<b>563</b>
Terminology and General Topics .....	564
Device Drivers .....	577
Disk Utilities and Applets .....	585
Virus Protection .....	592
Installation Issues .....	595
Networking and Communication .....	604
Multimedia .....	608
<b>Chapter 11: DOS and Windows Questions .....</b>	<b>617</b>
Terminology and General Topics .....	618
File Management and Virtual Memory .....	635
Communication Issues .....	642
Multimedia .....	644
<b>Chapter 12: Peripheral Questions .....</b>	<b>649</b>
Scanners .....	650
Printers .....	650
<b>Glossary .....</b>	<b>667</b>
<b>Index .....</b>	<b>675</b>



# 1

## System Questions

*System questions represent a huge range of possible topics and information, but this chapter will focus on just a few key areas. The chapter starts with basic terminology definitions, explores system problems indigenous to drive controllers, and looks at some system troubleshooting issues (i.e., system crashes). This chapter also explores power supply and battery backup questions. The last part of this chapter examines a comprehensive selection of SCSI questions.*

## Terminology and General Topics

### UNDERSTANDING JUMPERS

- Q1. *What is a jumper and how do I use it?*
- A. A *jumper* (Fig. 1.1) has the same function as a switch—it turns something on or off. For example, a jumper may determine whether or not a color monitor is attached to the system or if a hard drive is a master or a slave. If you have to set a jumper, refer to your user's manual for the settings—Do *not* change a jumper unless you know the correct setting for that jumper.

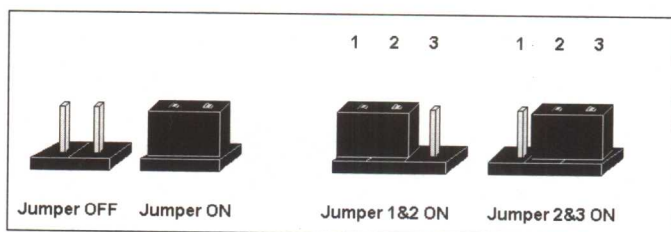


Figure 1.1 Typical jumper configurations

### COMPUTER MAKES A SQUEALING NOISE

- Q2. *I get a squealing noise from my computer when I turn it on. Why?*
- A. Squealing sounds are usually caused by mechanical problems—things are rubbing together. In most cases, you'll find that a fan is failing. Check to be sure that the squealing is *not* being generated from your sound board. Once that's out of the way, take a look at your CPU fan and power supply fan(s). Make sure all the fans are spinning, and see that there is no excess of dust built up on the fan blades. If you find the source of the squealing noise, replace it.

## UNDERSTANDING BIOS

- Q3. *I've just started learning about computers, and I'm already confused by most of the jargon. I've seen the word BIOS used all over the place, but nothing seems to describe what it is. Can you clarify things?*
- A. BIOS stands for basic input/output system. It is a set of *very* important software routines that have been tailored to your specific motherboard and encoded on a permanent memory chip (called a ROM chip) which is mounted on your computer's motherboard. Whenever an operating system (like DOS) or an application program needs to interact with your computer's hardware (i.e., saving or recalling a file from your hard drive), it works through an appropriate BIOS routine to accomplish that task. As far as the PC user is concerned, the BIOS is completely transparent—you're not even supposed to know it's there. In addition, the BIOS provides the test routines that check your computer each time it boots up. In fact, a BIOS is *so* important to a computer that if the BIOS is damaged or altered in any unexpected way, your computer may not even start up until the BIOS is replaced.

Traditionally, BIOS instructions on ROM were unchangeable, so to upgrade a BIOS, the physical IC had to be replaced with a new one. Today, BIOS is stored in a sophisticated type of reprogrammable memory chip called flash ROM, and this allows a BIOS to be reprogrammed (or flashed) by downloading and executing a BIOS update file obtained from the motherboard or computer maker.

## THE NEED FOR BIOS UPGRADES

- Q4. *I've been working with my Pentium 100 for a while now (and been pretty satisfied with it too), but my cousin told me that I should upgrade my flash BIOS. I've heard of this, but what really is flash BIOS? Should I even worry about upgrading? How much does it cost? How do I use flash BIOS?*

- A. That's a great question—let's start with the basics. Every PC has a BIOS (basic input/output system) which contains the instructions needed to operate most your computer's hardware. For XT, 286, 386, and most 486 systems, the BIOS is permanently recorded onto Read Only Memory (ROM) ICs so that the instructions would be maintained every time PC power was turned off. If you need to change those BIOS ROM ICs, you will literally have to purchase ICs containing updated BIOS programming and then replace the physical BIOS IC on the motherboard. To avoid the problems associated with hands-on BIOS replacement, designers started using a new generation of reprogrammable memory ICs called *flash* ROM. The idea is that you can reprogram your existing BIOS without ever having to replace the physical BIOS IC itself. Flash BIOS has some major advantages over traditional BIOS ROM: Flash BIOS files can be distributed freely over the Internet (so there are no costs for a new IC or shipping), and there are no replacement problems like bent IC pins or system damage from accidental static discharge.

There are two reasons *why* you'd want to upgrade your BIOS: bug fixes and new features. Bug fixes are intended to correct errors somewhere in the BIOS that might crash your PC under the right circumstances. If you're upgrading for new features, that might include support for huge hard drives or support for a non-Intel CPU. Regardless of your reasons, upgrading your BIOS is usually a good thing, but it's not something to be undertaken lightly. Unless you have a clear reason *why* you need an upgrade, it's best to just leave your current BIOS alone. If you do decide to upgrade, make sure that you download the BIOS file that is intended for your *exact* motherboard or system model.

Before you can flash your BIOS, you need to have the updated BIOS file (downloaded from your motherboard or system manufacturer), and you need to know the location of the write-protect jumper on your motherboard. Start by copying the new BIOS files to a bootable floppy disk. Turn the PC off and disable the write protect jumper for your flash BIOS. Boot the system again with that floppy disk in the drive, and allow the flash program to start (if your particular flash program gives you an opportunity to save your current BIOS to a file on the disk, *do it*). Select the



option to flash your BIOS, and allow the process to proceed all the way through to completion. It is *critical* that you don't reboot the PC or lose power in the middle of a flash process. This can corrupt your BIOS and render the whole system unbootable until the BIOS IC is replaced.

In most cases, the flash process should finish painlessly, and you'll probably hear several beeps to tell you the flash is finished. You should then shut down the PC, reenable the write-protect jumper, remove the flash disk from the floppy drive, and restart the PC. Flashing the BIOS is really not that hard, but you should *always* refer to the manual for your motherboard or PC for more specific directions or precautions.

## FINDING SUPPORT FROM ZEOS

- Q5. *Do you know whatever happened to Zeos? I have a monitor under warranty from them that is now nonfunctional. It seems I recall seeing mention on a mailing list somewhere that Zeos has gone out of business. Would you know if someone else took over their warranty work? Any information would be appreciated.*
- A. Zeos and Micron merged last year, but Zeos operations were shut down shortly after the merger. You can contact remaining Zeos technical support at 800-228-5390, or send an e-mail to [support@zeos.com](mailto:support@zeos.com). Also, all of the files that were part of the Zeos Web site are now residing at the Micron Web site: <http://www.mei.micron.com>.

## DISPOSING OF OLD PCs

- Q6. *I often find myself inheriting old (286 and 386) systems from colleagues and friends who upgrade to newer systems. The problem is that I don't know what to do with this hardware, and I don't have the heart to just toss it all in the dumpster. What can I do with this equipment?*