

Read the article "MP3: Decompressed" before answering questions 29 through 37.

MP3: Decompressed

Aside from the fact that MP3 players store and play music, how much do you really know about the multifarious gadgets?

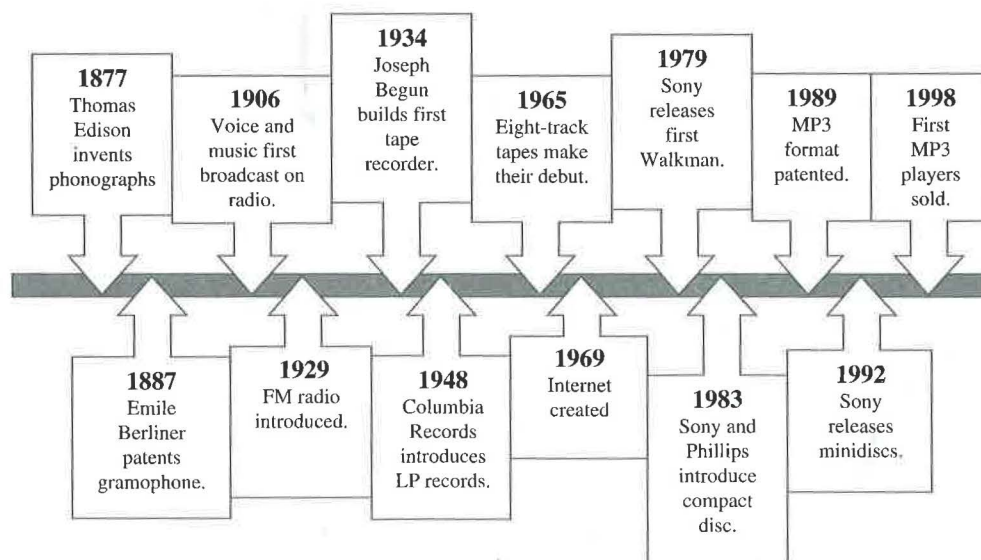
What Does MP3 Stand For?

Though most people can explain what an MP3 file is, they usually have a difficult time with the specifics—for instance, explaining what the *M*, the *P*, and the 3 represent. The MP3 format, or the technology of shrinking a music file, developed from a technology known as MPEG. That acronym stands for Moving Pictures Expert Group, a group of innovators who have taken on the responsibility of developing ways to store, send, and view moving pictures and audio. The technology they created for sharing compressed digital video files is also called MPEG. That takes care of *M* and *P*, but what about 3?

The primary goal of the Moving Pictures Expert Group is to create and then enhance files. The group meets about three times a year to discuss their research and their developments in the field of video compression. First they created audio layer I and audio layer II, both of which worked but stripped a lot of quality from music. Then the group created audio layer III, which allowed people to shrink music into files in which the quality remains intact.

So there you have it. An MP3 is really a Moving Picture Expert Group Audio Layer III file. No wonder they shortened the name.

A Timeline of MP3 Development



How Much Quality Is Lost?

MP3 technology continues to improve, and innovators of the technology use the human ear as their inspiration. These innovators are masters of the art of psychoacoustic compression, or shrinking files to include only what is perceivable to the human ear.

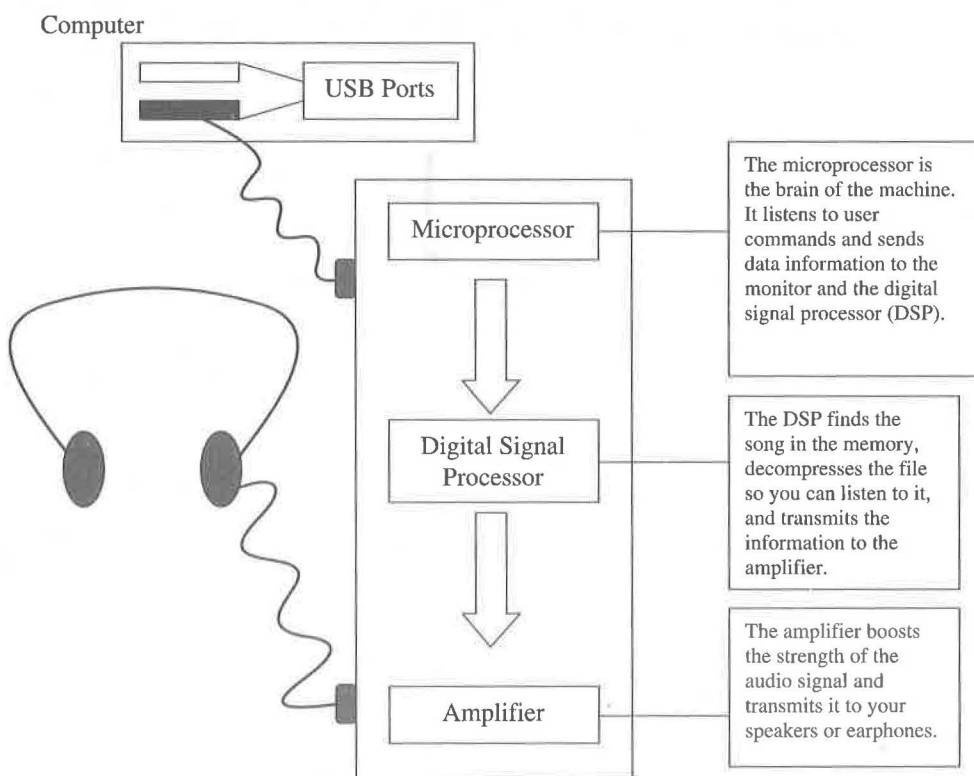
The human ear can only pick up fragments of sound for two reasons. First, some tones are just imperceptible to the human ear. Second, if one instrument produces a loud sound, the human ear cannot perceive the fainter tones underlying it.

Scientists use a process called perceptual noise shaping to remove sounds from music that the human ear cannot perceive. You might notice minor differences between an analog (or traditional) recording and an MP3 file of the same song because compression removes subtleties that are beyond detection by the human ear. You can notice only slight differences when you listen to an MP3, but if you compared the playback of an MP3 file to that of an analog recording on a high-fidelity system, the difference in quality would be quite noticeable.

How Compressed Is an MP3?

Audio Layer III provides a 12:1 ratio from analog to digital, which means a file is compressed to one-twelfth its original size. If you were to download one song from a CD onto your computer, it would take up about 40 million bytes (or 40 megabytes) of computer space. If you compress that music file into an MP3 file, it will only take up about 3.5 megabytes of computer space.

What Is Inside an MP3 Player?



If you could open up your tiny music storage device, you would be amazed at what goes on inside! That slim, shiny machine contains tiny parts that make music come alive. Check out the illustration of how MPEG audio layer III coding comes out of an MP3 player as music.

So What Should I Get?

There are two basic types of MP3 player to choose from, each with its own advantages and disadvantages:

- A **flash MP3** player has no moving parts inside and therefore cannot store very much information—only about 200 songs. However, you do not have to worry about your music skipping. These devices are very inexpensive compared with their more complex counterparts, the hard-drive MP3 players. If you want to use your device primarily for exercise, the flash MP3 player is the machine for you.
- A **hard-drive MP3** player can have as much memory as some computers and, also like your computer, can store any type of file, not just MP3s. This type of player can also hold photos, video, or text files and can be used to transport files from one computer to another. The primary benefit of a hard-drive device is that it can store so much information. The drawbacks are that more space means more breakable parts, a bigger price tag, and a bulkier, heavier player. Finally, the music can skip if you jostle the device too much.

As with any purchase, you should educate yourself and then make a decision to purchase based on your personal preferences. Whichever type of player you choose, you will have a greater appreciation for the device now that you know all that is going on inside!

Answer questions 29 through 37. Base your answers on the article "MP3: Decompressed."

- 29 According to the evidence in the article, which of the following features contributed most to the popularity of hard-drive MP3 players?
- A. the ability to store a large amount of information
 - B. a smaller price tag
 - C. the ability to play during exercise
 - D. unbreakable parts

- 30 Read this passage from the article.

The MP3 format, or the technology of shrinking a music file, developed from a technology known as MPEG. That acronym stands for Moving Pictures Expert Group, a group of innovators who have taken on the responsibility of developing ways to store, send, and view moving pictures and audio.

What is the meaning of *acronym* in this passage?

- F. a word that means the opposite of a particular term
 - G. a word that stands for a complex scientific term
 - H. a word formed from the first letters of the words in a compound term
 - I. a word used by scientists and inventors to refer to one of their innovations
- 31 What is the main purpose of the subheadings in this article?
- A. to introduce the topic of each section of text
 - B. to introduce the topic of each section of text and each illustration
 - C. to emphasize the cause-effect structure of the article
 - D. to answer important questions about the subject matter

- 32 Which statement from the article provides the BEST evidence of the versatility of MP3 players?
- F. "As with any purchase, you should educate yourself and then make a decision to purchase based on your personal preferences."
 - G. "That slim, shiny machine contains tiny parts that make music come alive."
 - H. "These innovators are masters of the art of psychoacoustic compression, or shrinking files to include only what is perceivable to the human ear."
 - I. "This type of player can also hold photos, video, or text files and can be used to transport files from one computer to another."
- 33 According to the author, the best thing to do before buying an MP3 player is to
- A. ask to see the inside of the MP3 player and examine the circuitry in detail.
 - B. read articles about the benefits and drawbacks of various MP3 players.
 - C. query several people who already own MP3 players about their sound quality and mechanical performance.
 - D. focus only on flash MP3 players because they have no moving parts and you do not have to worry about music skipping.
- 34 The main purpose of the diagram under the heading "What Is Inside an MP3 Player?" is to
- F. explain the history of MP3 players.
 - G. show what an MP3 player looks like.
 - H. explain how an MP3 player works.
 - I. teach how to repair an MP3 player.
- 35 The article states that *Some tones are just imperceptible to the human ear*. Which of the following best restates the idea in this sentence?
- A. Some sounds are simply too low or too high for a person to hear.
 - B. Some musical notes sound harsh when heard together.
 - C. Humans can hear some tones more clearly than others.
 - D. The differences between most musical sounds are not apparent to the ordinary human ear.

- 36 The ability to compress audio files is important to computer users because
- F. compressed digital files are much less expensive than analog files.
 - G. compressed files require the use of a digital signal processor.
 - H. compression removes unwanted sounds from a music file.
 - I. compressed files take up much less space on a computer.
- 37 Which of the following would be a better subheading for the first graphic than "A Timeline of MP3 Development"?
- A. A List of Innovators in MP3 Technology
 - B. A Timeline of Innovations in Recorded Music Up to MP3
 - C. A Timeline of Important Events in Music History
 - D. A Comparison of Analog and Digital Music Technologies