

Analog vs. Digital Music Players

How does a Record Player (Turntable) Work?

The **turntable** is the circular plate on which the record sits. The turntable rotates or spins.

The **stylus**, or needle, is the smallest and perhaps the most important component of the record player. It is made from a diamond or other hard material, shaped like a cone and suspended by a flexible strip of metal. The pointed end is the only piece that touches the top of the record and it rides around the spiraling grooves of the disk, picking up the vibrations which are ultimately turned back into sound.



The stylus sits at one end of the **tone arm**, which is mounted to the side of the turntable and sits parallel to the record. With the needle or stylus placed in the outermost groove of the record, the tone arm follows the groove as it spirals inward, traveling across the record in an arc as the record spins beneath it. As this happens, the vibrations travel along a flexible metal strip and wires housed in the tone arm to the **cartridge** in the end of the tone arm. The cartridge receives the vibrations, which are converted to electrical signals through a coil in a magnetic field. The electric signals are carried along wires to the **amplifier** which enhances the power of the signal. Finally, the signals are converted back to sounds that come out through the speakers.

How does an MP3 player work?

If MP3s are computer files, it follows that MP3 players must be computers.



All computers, which are machines that process information (data), have four basic components. They have an **input device** (for getting the data in), a **memory** (for storing data), a **processor** (for working on the data), and an **output device** (for getting the data back out again).

Switch on your iPod to play your favorite track and it works just like a computer. The processor chip loads an MP3 file, reads the ID3 index cards, and displays the artist and track name on the display. Next, it works its way through the MP3 file reading each frame in turn. It reads the header, followed by the data, and turns the digital information (the binary ones and zeros) back into sound frequencies that your ears and your brain decode as music. That's pretty much all there is to it. But remember this: the real secret of a digital music player is not the plastic gadget in your hand but the clever technology behind the MP3 files it's playing!