# Technofile: MP3 players

MP3 might have got itself a bad name due to online piracy, but a portable digital audio player is one device that music lovers, including Alex Katz, can't live without

Unless you've been living under a rock for the past few years, you'll have heard the term MP3 used frequently by technology and music enthusiasts. But because of the controversy surrounding MP3s and the widespread reports connecting them with music piracy, you may not associate this format with anything other than the illegal sharing of music over the internet.

This isn't, however, the case. MP3 is simply an audio storage format that allows you to pack up to 10 times as much information in the same amount of space as standard CD audio. Because of this, devices that can play MP3s make up one of the fastest growing families of consumer electronics products.

Over the next few pages, we'll show you the benefits of MP3 technology, the differences between various players and how to go about choosing the correct device for you.

## MP3: the lowdown

Contrary to popular belief, MP3 is not short for Mpeg-3 – it actually stands for Mpeg-1 Audio Layer 3. Although the MP3 format only came to prominence in the late 1990s, it was developed in 1987 by the Fraunhofer Institute in Germany, which was at the time researching digital audio broadcasting technology.

Fraunhofer discovered that by using perceptual coding techniques, which address the perception of sound waves by the human ear, you can discard the majority of information in a CD audio track without any noticeable loss of quality. Thus a standard MP3 file is around a twelfth of the size of the original file.

The compression technique is similar to that used in Jpeg images and, also like Jpegs, MP3s can be encoded at different rates: the higher the bit rate the more faithful the sound is to the original, but the bigger the file size.

The MP3 format grew with the rise of the internet. People discovered they could store hundreds or even thousands of songs on their hard disks and share them with friends easily thanks to the relatively short download times. Of course, sharing copyrighted music in this way is illegal (see *Music piracy* on page 76) and the MP3 format has been struggling to shake off its poor reputation ever since.

But despite the music industry's best efforts it has been impossible to curb the rise of MP3 and most people who use the format are not engaging in anything illegal. Instead they are attracted by the convenience of being able to store lots of songs in a small amount of space, as well as the possibilities the technology opens up for obtaining and listening to music.

Listening to MP3s on your PC is all well and good, but once you've got all that music in MP3 format you'll want to take it with you wherever you go. Hence

the portable MP3 player. There are three main types – solid state devices, MP3 CD players and hard disk-based models – and we'll look at each of them in turn.

## Solid state MP3 players

The advantage of solid state memory such as flash is that, unlike traditional PC hard drives, it uses no moving parts making it ideal for portable devices. There are literally hundreds of solid state players available, ranging from basic pared-down models like the Kiiro CA64S right up to all-singing, all-dancing models such as SonicBlue's Rio S50.

The latter range is blessed with a host of features, from built-in radios to detailed LCD displays and support for multiple formats. Even at the highest level solid state MP3 players retain extremely affordable price tags. However, there are a few important areas to focus on if you're to get the best value from your new purchase.

First, how much storage does the device provide? Some MP3 players are lumbered with just 32MB or 64MB of RAM – only enough for approximately 30 minutes to an hour of music. If there's no way of expanding the memory capacity, you could find yourself running out of space rather quickly.

The best solid state players have both built-in memory and an expansion slot

→ The small but innovative Muvo plugs straight into your PC's USB port, making downloading more convenient

which can take a variety of cards. Try to find a device which uses industry-standard media such as Secure Digital or CompactFlash. Some models use proprietary storage technology, but this costs more and can be hard (or, in the future, even impossible) to track down.

Alternatively you could look at a device like Creative's Muvo. Besides having built-in solid state storage, the player's battery can be removed, allowing the device to plug straight into your PC's USB port for downloading files. No cables are required, making the Muvo extremely simple to use, and the player can double up as a portable data storage device.

For larger capacity devices, having an LCD display becomes important. If you've only got a handful of songs on the player you can cope without a display, but with larger collections it can be frustrating if you can't see what track you're listening to, how far into the song you are, what the order of play is and so on.

Devices with screens need to have proper support for ID3 tags so that information relating to the artist, song title and track number can be stored. This data is either entered on your PC or downloaded from the internet before it is transferred to the player.

Don't ever assume that all MP3 players are created equal in terms of sound quality, either. Check what sort of headphones/earphones are supplied and whether you can swap them for your own headphones or speakers if required. Ask for a demonstration before you buy, if possible, as you'd hate to get the product out of the box only to discover that the sound reproduction is cheap and tinny.

Other products that are worth a look include LG Electronics' devices, Samsung's Yepp range and the MP-5000 from Teac. If you're impressed with Teac's hi-fi equipment you'll be pleased to hear the MP-5000 is just as stylish, with a brushed metal finish and a tiny credit card-sized enclosure.

## Extra features

**M**any of the devices we've discussed are not just MP3 players. For starters, most models can play other music formats such as WMA (Windows media audio), CD audio and AAC (advanced audio coding). This latter format is brand new and offers improved levels of compression and sound quality. Indeed, many experts predict it will eventually take over from MP3 as the music format of choice. A lot of devices also have FM tuners built in, so if you're bored of your MP3s you can switch to the radio and, in the case of the Archos Jukebox FM Recorder, you can even record live broadcasts.

Other devices, such as the Apple iPod (right), allow you to store your address book and calendar, cutting down on bag clutter while you're out and about. If you can't live without your fully featured PDA (personal digital

assistant) then perhaps you should consider one of Sony's Clie handhelds or any of a number of Pocket PC devices which have MP3 playback functionality built in. As with most dedicated music players based on solid state memory, the drawback of these devices is the amount of available storage and the cost of adding more memory.

Other unusual takes on the MP3 player concept include the MadWaves MadPlayer, which lets you compose your own music. You can then save the tracks to the memory card or transfer them to your PC.

Digisette's Duo-DX 496, on the other hand, is shaped like an audio cassette, so you can put it in your stereo to record from radio, CD or any other source. You can even use it in your car stereo to play your MP3s – and there's no need for additional equipment.

## Music piccy

The rise in the popularity of MP3s has inevitably been followed by an increase in music piracy. The relatively small file size of an MP3 has caused a proliferation of services exploiting the ease of downloading these files over the internet. The once-popular Napster and AudioGalaxy are now defunct, but the Gnutella network is still thriving. Yes, it is a lot easier nowadays to get hold of music illegally, but most file-swappers are not criminals – they are simply using the technology to fully exploit its potential in the absence of a viable legal alternative.

Unable to wipe out these services, the record companies are experimenting with subscription-based music sites where you can pay for and download songs legally. However, until these law-abiding alternatives offer the depth, freedom and ease of use of the illegal sites they won't catch on. Even so, a recent report by Forrester Research showed that people who download the most music online are also the most likely to spend money in record shops. It seems the record companies

are worrying unnecessarily, and are simply using the MP3 generation as a scapegoat for a stagnating industry.

It's not just online services that are suffering at the hands of the record industry. Increasing numbers of CDs are being sold with copy-protection software, meaning you can't rip tracks from them. In some cases you can't even play the discs in your PC's CD-ROM drive. If these copy-protection technologies succeed, MP3 players will be rendered virtually useless. The only way the record companies will get the message that this is not a solution is if people refuse to buy protected CDs. Fortunately legislation is already in place forcing these discs to be clearly labelled, as they don't strictly adhere to the CD standard.

A number of companies are exploring the possibilities of how digital music can happily coexist with copyright laws to enable the MP3 generation to thrive. Many of these are collaborating under the banner of the SDMI (Secure Digital Music Initiative). Find out more at www.sdmi.org.

→ You can fit about 10 hours worth of MP3 files on a CD, but the players still suffer from skipping and short battery life



The handy built-in microphone allows the MP-5000 to double-up as a digital voice recorder, but it's limited by its 96MB of non-expandable memory.

Solid state MP3 players are small and light enough to slip into a pocket and the lack of moving parts makes them extremely durable – ideal for a tough session on the treadmill at the gym. Furthermore, they require very little power, so batteries can last for weeks without having to be recharged or replaced. But their biggest limitation is the low storage capacities. If you want more than a couple of hours of music on your device at any one time, you'll need to look at the alternatives.

## MP3 CDs

An obvious way to make a large quantity of MP3s portable is to burn them on to a CD. A blank CD costs around 30p and holds 650MB (approximately 10 hours) of music. Of course, if you don't have a CD-RW drive built into your PC you'll need to purchase one in addition to your MP3 player, so this will push the cost up a significant amount. See our CD drives chart on page 252 for an idea of cost.
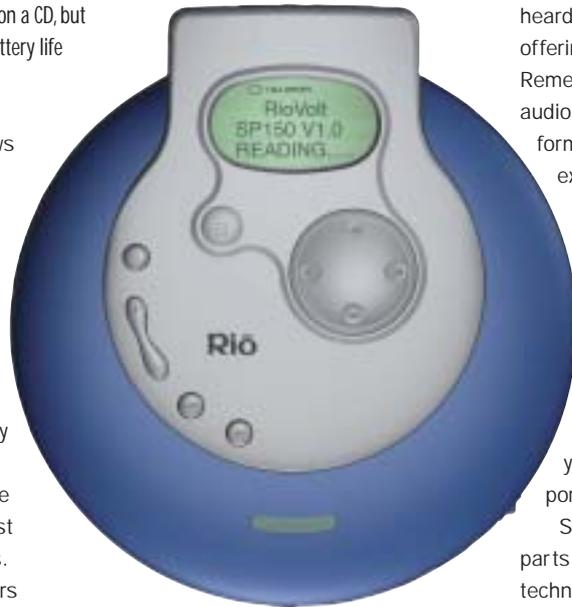
MP3 CDs can be used just like standard audio CDs, except that you can now fit on 10 times as much music on one. Most MP3 CD players can play standard audio discs as well, making these devices very versatile. Dioneer is one company which specialises in MP3 CD players – the DCP-200, for example, can play WMA (Windows media audio) files as well as MP3s and CD audio.

If you're not happy about buying a product from a company you've never

heard of then take a look at SonicBlue's offerings, particularly the RioVolt SP250. Remember that most mainstream portable audio manufacturers support the MP3 format as well. Sony's D-CJ01, for example, is a conventional CD Walkman, built with Sony's typical style and expertise, but is enhanced by its built-in support for MP3 CDs.

Before you rush out and buy an MP3 CD player, though, bear in mind that they suffer from many of the same limitations as regular portable CD players. First, unless you have very large pockets, portability is not their strongest point. Second, they rely on a lot of moving parts – even with the best antishock technology in the world they are not immune from skipping. Third, all that spinning takes up a lot of battery power and decoding the MP3s takes up even more, so you'll get less playback time than with a standard CD player.

## So what's the alternative?

Hard disk-based MP3 players are the most recent category of devices, having only been around for a couple of years. They store their music on a portable hard disk and, with capacities that range from 5GB up to a massive 40GB, offer enough space for a stunning 666 hours of music.

## Features comparison

| | Model | Supplier contact details | Website | Price | Warranty | Dimensions (wxdxh) | Weight | Type of memory | |
|---|---|---|---|---|---|---|---|---|---|
| **CD** | SonicBlue Rio Volt SP250 | 0118 963 7420 | www.sonicblue-europe.com | £170 | one-year parts and labour | 1,230x31x147mm | 235g | CD | |
| | Sony D-CJ01 | 020 7365 2947 | www.sony.co.uk | £128 | one-year parts and labour | 132x138x29mm | 198g | CD | |
| **Hard disk** | Apple iPod | 0800 039 1010 | www.apple.com/uk | £280 | one-year parts and labour | 102x61x18mm | 185g | hard disk | |
| | Archos Jukebox FM Recorder20 | 020 7949 0115 | www.archos.com | £280 | one-year parts and labour | 113x79x30mm | 290g | hard disk | |
| | Creative Jukebox Zen | www.dabs.com | uk.europe.creative.com | £280 | two-year parts and labour | 113x76x25mm | 268g | hard disk | |
| | Creative Jukebox 3 | www.dabs.com | uk.europe.creative.com | £255 | two-year parts and labour | 123x130x35mm | 294g | hard disk | |
| | SonicBlue Rio Riot | 0118 963 7420 | www.sonicblue-europe.com | £281 | one-year parts and labour | 136x86x35mm | 284g | hard disk | |
| **Solid state** | Creative Muvo | www.dabs.com | uk.europe.creative.com | £85 | two-year parts and labour | 73x35x16mm | 28g | solid state | |
| | SonicBlue Rio S50 | 0118 963 7420 | www.sonicblue-europe.com | £170 | one-year parts and labour | 58x86x25mm | 57g | solid state, MMC expansion slot | |
| | Teac MP-5000 | 020 8906 8111 | www.teac.co.uk | £152 | two-year parts and labour | 86x56x9mm | 62g | solid state | |

Technology built into the player means the data is copied from the disk to solid state memory in chunks, reducing the amount of time the hard disk has to spin. This not only conserves battery life, it also helps prevent tracks skipping.

The two original manufacturers in this marketplace, Archos and Creative, both have a range of products bearing the Jukebox name. Archos' strength lies in recordable devices, which are capable of creating MP3s directly from an audio source rather than having to rely on a PC-based encoder. Its latest product, the Jukebox FM Recorder 20, can also record audio from its built-in radio. Creative's

Jukeboxes are packed with specialist features that will impress the true audiophile. Sadly most of its products are the same size and shape as a CD player, which limits their portability.

But Creative's latest offering, the Jukebox Zen, offers all the benefits of its larger devices but in a smaller, more portable and stylish enclosure. The look of the Zen owes a lot to the iPod, one of the most influential portable music devices of recent years.

Made by Apple, the iPod was originally only available for Mac users. But demand from PC users was so high that Apple capitulated and brought out a Windows version last summer. What makes the iPod special is the elegance of its design and the simplicity of its interface. You navigate through the menus using the scrollwheel on the front and download songs from your computer using FireWire instead of USB. This ensures lightning-fast downloads. Of course, if you don't have a FireWire port built in you'll also have to pay extra for this type of card.

Three different iPod models are available, with a 5GB, 10GB or 20GB

drive. SonicBlue also has a hard disk-based device, the Rio Riot, with a 20GB disk, built-in FM tuner and an extra-large LCD screen.

## Getting hold of music

The easiest method of loading up your MP3 player is by ripping tracks (converting a standard CD audio file into MP3 format) from your own music collection. Most players are supplied with software which allows you to encode MP3s, organise songs into playlists and download them to the player. Alternatively, many devices work with software already on your PC, such as Windows Media Player which has a built-in MP3 encoder.

Whichever method you choose, simply plug the device into either a USB or FireWire port and the software will guide you through the process of loading up the songs. Basic players will have few options but to load the selected songs one-by-one, while hard disk-based devices will allow you to synchronise your entire music library and transfer playlists so you can determine the order of play and different sets of songs for various occasions.

One of the MP3 format's key benefits is its relatively small file size, making for easy transfer of files over the internet. You wouldn't, therefore, be using your MP3 player to its full potential if you restricted

← The Teac MP-5000 is a basic solid-state player – nothing fancy, but not too expensive either

| Capacity | Batteries used | Battery life | Standards supported | ID3 tag | FM tuner | Interface | Software |
|---|---|---|---|---|---|---|---|
| 650MB | 2 x AA NiMH | 15 hours | MP3, WMA | yes | yes | CD-R/RW | Real Jukebox 2.0 |
| 650MB | 2 x AA alkaline | 15 hours | MP3, CD audio | yes | no | CD-R/RW | none supplied |
| 10GB | lithium-polymer | 10 hours | MP3, WAV, AIFF | yes | no | FireWire | MusicMatch Jukebox (Win), iTunes (Mac) |
| 20GB | lithium-ion | 12 hours | MP3 | yes | yes | USB 2.0 | MusicMatch Jukebox |
| 20GB | lithium-ion | 12 hours | MP3, WMA, WAV | yes | no | USB 1.1, FireWire | Creative PlayCenter |
| 20GB | lithium-ion | 11 hours | MP3, WMA | yes | no | FireWire, USB, IR | Creative PlayCenter |
| 20GB | lithium-ion | 10 hours | MP3, WMA | yes | yes | USB 1.1 | Real Jukebox 2.0 (Win), iTunes (Mac) |
| 64MB | 1 x AAA alkaline | 12 hours | MP3, WMA | no | no | USB 1.1 | none supplied |
| 128MB, upgradable to 256MB | NiMH | 20 hours | MP3, WMA | yes | yes | USB 1.1 | Rio Music Manager |
| 96MB | lithium-ion | 11 hours | MP3 | yes | no | USB 1.1 | Teac MP3 Manager |

yourself to listening only to songs you have bought on CD. The era of online music services is very much in its infancy and is without doubt one of the most controversial topics in both the technology and music industries (for more information, see *Music piracy* on page 76).

A handful of sites exist that allow you to legally acquire and download the tracks. Sites such as MP3.com and Pressplay.com are run in conjunction with the major record labels and let you download a range of popular (and less popular) music for a monthly subscription fee. Some sites, such as SonicBlue's Rio Music Store (www.sonicblue.com) let you pay for individual tracks you download, while other sites are dedicated to promoting new talent so their music is available for free.

As it stands, most of these services are rather restrictive in the way they operate and the conditions that are placed on the users, so they're not exactly being embraced by the public.

In the long run, however, when the record companies finally realise that it is ultimately the customer that controls the music industry, these sorts of music distribution methods will gradually replace the traditional process of buying CDs from record shops. No longer will you have to pay £15 for a whole album from which you only like two or three songs.

## Verdict

There are hundreds of MP3 players available on the market, and it's still early days. Not all models offer many advantages over conventional portable music players, but plenty deserve another look.

Different types of storage and feature sets will suit different users, but a couple of players grabbed our attention. Creative's Muvo is an innovative solution to portable music. At £85 for the 64MB model, it's also inexpensive. However, the Muvo's capacity and lack of an LCD screen are limitations.

If you are put off by this, some of the Rio products are a good alternative. The Rio S50 is still small and light but has a display, 128MB of built-in memory and an MMC (Multimedia Card) expansion slot, as well as several bonus features. The one drawback is cost: at £170, the Rio S50 is priced more like a hard disk-based player.

We haven't been impressed by any of the CD-based solutions, whose size, battery drain and reliance on moving parts negate the benefits of MP3 technology.

If you're looking for a fully featured MP3 player then a hard disk-based device is the way to go. Our overall favourite hard

↑ Hard disk-based Jukebox players like the Archos FM have memories upwards of 5GB and come packed with impressive features

disk-based MP3 player has to be Apple's iPod; its stunning design, simplicity and ease of use have yet to be beaten.

The iPod is the smallest and lightest hard disk player available (it's about the size of a deck of cards) so it can easily slip unnoticed into a pocket. The battery life is excellent and, while it doesn't have the extra features some might want, it concentrates on what it's meant to do: play music. And it does that very well indeed. ■