Paul Smith dreams of finding a mini-disk drive that would let you record music digitally.

Feeling all MD inside

This month I have mostly been considering the relative merits of sliced bread and MP3. This is because I have come into possession of one of Diamond's Rio players, a small MP3 player, smaller than a pack of fags, with no moving parts and one AA battery lasting forever (so far).

MP3, which stands for MPEG 1 Layer 3, is a great audio compression format. It can squeeze CD tracks into about a tenth of their former selves without any loss of quality. But MP3 is no great respecter of copyright, and that's winding some people right up.

A&R folk mostly; any musician with the slightest foresight has already woken up and got a whiff of the freshly brewed. The web, then, is crammed to the technogunnels with this stuff. There are very few tracks that aren't up there, from Santana to Yes . Of course, almost all are illegal, but you can also create MP3s from your own CDs and transfer them to your Rio player.

Actually, this is also illegal: making any copies of copyright material without the owner's permission, even for your own use, is against the law. Time-shifting with a VCR is excepted. But people do it; after all, they paid for the CD, they want to listen to it however they want.

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MP3 players aren't quite there yet. I have a 96Mb Rio and it's expensive and time-consuming to get tracks on to it. And you need a PC every time you want to change the music. Mini-disc (MD) is a much better bet. Indeed, you can record digitally end-to-end if you have a digital optical output on your sound card, so you can make perfect copies of either your CDs or your MP3s.

But it's almost impossible to find an MD drive for a PC. Such a find would be great: you could record easily, add track information and, at 130Mb each, it would make a great alternative to the Zip as a data disk. Sony produced one but it failed, probably because it was launched at a time when MD prices were high. The Sony drive was also too expensive and too slow, with a data transfer rate of around 280Kbps. Now that it's a popular format, there are no drives around.

Searching for one, I came across Tim Craig, managing director of EDL UK, who had nothing better to do of a Friday evening than to give me a crash course in audio compression techniques. You see, there are about ten ways of compressing sound. MP3 uses two, but compresses to about a tenth the size of the raw stream. MD, using acoustic transfer coding (ATRAC), uses four and compresses by a fifth.

Both compression techniques are transfer coding techniques, moving the information from the time domain to the frequency domain, because the ear is a frequency-selective device.

MP3 uses simultaneous, or absolute, encoding where, if two sounds occur at the same time, only one may be picked up by the ear, and this is the one that will be recorded. It also uses post- — or forward — masking: a quiet sound immediately following a loud one won't be picked up by the ear, so it can be ignored.

ATRAC also uses pre-, or backwards, masking: the ear will not pick up soft sound played immediately before a loud one. And then there's cross-channel correlation, where the same sound occurs twice. Here again, only one sound need be recorded.

In the same way that an ocular flaw called 'persistence of vision' lets a movie's series of rapidly replaced individual frames appear to flow smoothly, so the brain can fill in missing pieces of aural information automatically. Have you ever strained to hear a song, which doesn't make any sense until you pick up the beat, and all of sudden you know what the song is? That is happening because the brain is going 'Oh, I get it: this is the type of song known as "folk rock". I know what's supposed to be happening now.' It is this sort of flaw that transfer coding exploits.

All very well, but I still don't have an MD drive. My new-found mate, Tim, thinks that boat has sailed: even though MD discs are 25 percent bigger than 100Mb Zips, and one fifteenth the price, a magneto-optical drive is just too slow. Tim rather fancies FireWire, but this is not going to be in portable devices for years.

So, could someone out there *please* build us a nifty MD drive? Now?

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