

Sound | Part C

You can probably guess that the more snapshots we take, the better quality of sound. The more complete and longer each of these snapshots – again, the better the quality. But all that results in more zeros and ones which take up more space on disk and requires more processing, and faster computers. That is why higher sampling rates and bit depth is used by professionals with big budgets. Once the sound is converted into the digital form, it can be stored on a hard disk, or a CD, or a DVD, sent over the internet or via Bluetooth.

The number is of course stored in a binary form – zeros and ones. The device that performs this function is known as AD converter for Analogue to Digital, that is found in your phone, computer soundcard or a recording studio. Now what happens to the sound wave between the snapshots? This information is discarded and that allows us to store more digital information about sound in a smaller space or bandwidth than we ever could in the analogue form. When these zeros and ones get converted back to the continuous wave, the missing information is ‘interpolated’ – generated by copying the neighbouring snapshots into the silent bits. So, anything very fast that might have affected the shape of the wave – like a very fast percussive sound, a hand clap, will either get ignored or smeared like you hear on the very low quality MP3. Additionally, some cheap amplifiers have a problem switching from absolute silence between the snapshots or ‘samples’ to the sound of the next sample, so they develop this metallic sounding resonance that is fatiguing to the ear over long time – which makes some people hate the ‘digital’ sound.

The problem with DAB radio is also related – when listening to radio in your car you might get interference or static as you go around a hill or a tall building. But with DAB radio it will just go silent, as there are no samples to receive.

Advantages of digital audio are similar to that of any digital data – it can be easily manipulated on a computer, mistakes can be fixed, new sounds and textures created, performances can be sped up or slowed down, it can be copied billions of times without any loss of quality, it takes up very little space and can be backed up and verified. The equipment that works with digital sound uses cheaper plastic parts, mass produced and small, so you can carry all of your music with you.

Disadvantages include low sound quality, design compromises of devices being quiet and boring in sound, and artefacts which are barely noticeable imperfections in sound which were not present in the original.