MPEG Audio Standards

The Motion Picture Experts Group defines professional audio and video standards; including data reduction schemes. MPEG1 Layer 2 emerged in 1987 and allowed data compression ratios of 12:1 to be achieved. MPEG 1 Layers 1, 2 and 3 audio achieve data reduction by exploiting a characteristic of human hearing where 'quiet' frequencies are perceived to be inaudible, when louder sounds at nearby frequencies are present. This psychoacoustic masking principle basically works on the idea that if a particular band of 'quiet' frequencies is next to a louder adjacent band of frequencies, the quieter sound is disregarded and therefore excluded from the encoding process which, of course, saves data.

MPEG 1 Layers

Layer 1
- Used for the Digital Compact Cassette in the early 1990's, no longer used.

Layer 2 (sometimes known as MPEG L2, MP2, Musicam®)
- Uses fixed frequency bands during the encoding process, which although workable, is not ideal. Good results are possible at 192 kbps which is regarded as a CD-like quality. Layer 2 is also used at rates of 128kbps for occasional programme feeds as it can be accommodated on a bonded pair of ISDN channels.

Layer 3 (sometimes known as MPEG 3, MP3)
- Uses logarithmically divided frequency bands, similar to the behaviour of the ear and offers better quality than Layer 2 for a given bit-rate. Despite advances in audio encoding it is still commonly used for media devices and internet audio streams.

AAC - Advanced Audio Coding
- Is a more recent perceptual compression standard for digital audio, that offers superior quality sound than previous MPEG coding schemes for the same bit rate. Offering a large number of possible sample rates, AAC is noticeably better than MP3 for low bit rate working.

HE-AAC (Sometimes known as MPEG-4 HE-AAC, and commercially available as aacPlus, aacPlusV2, AAC+)
- Designed for streaming audio applications, a development of the AAC standard that additionally incorporates spectral band replication (SBR) and in the latest version, parametric stereo operation. MPEG-4 HE-AAC is regarded as state-of-the-art for streamed audio.

AAC LD
- A variation of AAC that provides high quality audio for two way communications connections or programme feeds where delays are not acceptable. Coding delays comparable to older standards such as G.722 are possible.

MPEG-4
The MPEG-4 standard does not actually specify a particular audio coding scheme but offers a list, or kit of 'tools' (coding schemes) that are allowed within the standard. Various coding schemes can therefore be used in MPEG-4, depending on the application.

MPEG-2 (in a video context)
- Is a standard for Digital Video used for Digital Video Broadcasting (DVB) and DVD. Not to be confused with MPEG1 Layer 2 audio, MPEG-2 Video's audio is similar to MPEG-1 Layer 2 audio but has a multi-channel capability to facilitate the multi-lingual sound or tertiary audio information.