BBE M3 Mobile Audio

Sound Improvement of Digitally-Compressed-Audio

For Mobile Phone Audio

The BBE M3 Mobile Audio process improves the sound quality of digitally-compressed audio in any format including MP3.

BBE M3 is an integration of the BBE, MP (Minimized Polynomial Non-Linear Saturation), and spatial 3D (ViVA) processes. Digital compression eliminates a great deal of harmonics and some stereo image in order to reduce information size, which degrades sound quality. BBE M3's MP Process effectively re-generates the lost harmonics and the 3D (ViVA) process supplements weakened stereo image and ambience while keeping the monaural components unchanged. BBE M3 adds more details, warmth and nuance to the sound. (BBE M3 is not a surround process.)

- ✓ ***Reference Grade Sound Quality***
- ✓ ***Extremely Simple Process***
- ✓ ***Consistent Sound Improvement***

1. Applications

Mobilephone Audio (Headphones and Speakers), Mobile TV

2. Compatible Technologies

MP3, AAC, MP4, WMA, ATRAC, AC3, DTS and all other digitally compressed audio.
CD (PCM), WAV, MLP.

3. Improvements

- Details and nuance restoration
- Adds warmth to the sound
- Improvement of low-level sound
- Frequency expansion and harmonics restoration
- Improved transients
- Sound field recovery
- Improvement of deep bass
- Increased volume while keeping the p-p swing unchanged

4. HI (Hearing Impaired) Mode

Provides clear and comfortable sound to the elderly and hearing impaired

5. Solution

Digital (About 7 MIPS)

Key Advantages

Simplicity
BBE M3 Mobile Audio requires a mere 7 MIPS (running on typical DSP) process. It does not have any impact on the battery life of portable equipment. The required memory size is also minimal.

Reference Grade Fidelity
BBE M3 Mobile Audio is not a surround process. It provides reference-grade sound quality to the headphone listeners. The frequency response is flat and smooth compared to other known headphone processes.

MP Process (Harmonics Re-generation)
The MP (Minimized Polynomial Non-Linear Saturation) Process used in BBE M3 regenerates harmonics from the source material, effectively recovering warmth, details and nuance. The MP Process works evenly on the entire audio range; it does not boost any particular frequencies. The sound character remains unchanged while the sound quality is improved. ***(See "BBE MP" white paper)***

Transient Improvement
The MP process is placed after the BBE process, which speeds up higher frequencies relatively. The generated higher harmonics are more time-advanced compared to lower frequencies. This improves the transient response of reproduced acoustic waveforms of headphones. BBE MP also improves percussive sound reproduction.

ViVA 3D (Spatial) Process
Digital compression often reduces the sound's stereo image to reduce file size. BBE M3's ViVA 3D process supplements the weakened stereo image and ambience while keeping the monaural components (such as solo vocal) unchanged.

BBE M3 does not use any reverberation or delay. It does not add odd phase information to widen the sound image either. (It is common to add some odd phase information to spread the sound wider, but that creates a weak and distant center, and strange "air pressure" that discomforts the ears.) The ViVA 3D process only enhances the ambience and background information from the source material. It does not touch the monaural information. Its frequency response is flat unlike most of the 3D sound processors. BBE M3 provides musically-accurate 3D sound, keeping directionality clear. Solo musicians stay where they are while widening the image of background chorus and orchestra. ***(See "BBE ViVA" white paper)***

Improvement of Low-Level Sound
BBE M3 improves the quality of very low-level sound. Delicate sound often masked by other louder sound (such as drum brushing behind other instruments or vocal) reappears.

Deep Bass Improvement
The MP Process generates harmonics from very low frequencies as well (e.g., 10Hz to 30Hz, or 20Hz to 60Hz.) Some inaudible bass become audible. Deep bass gains more clarity when harmonics are added. The continuous deep bass of pipe organ or rhythmical wood bass become more powerful after this process.

HI (Hearing Impaired) Mode

The HI mode in BBE M3 provides effective clarity enhancement for the elderly and hearing impaired without using an aggressive high frequency boost. HI mode adds an extra yet mild high-frequency boost combined with phase adjustment. The result is natural and clear sound for the hard of hearing.