Introducing microQ

microQ™ is a compact and highly efficient software digital audio engine providing functions such as polyphonic ringtones, game sound, digital effects, music playback and recording for portable applications including internet appliances, hand-held and mobile devices.

microQ is inherently modular, scalable and portable. The core components consist of a digital audio playback engine, a wavetable synthesis engine with a scalable instrument set, and a multi-channel stereo mixer.

To this core may be added cutting-edge features such as dynamic spectral response enhancement, **3D expansion** and **full 3D positional audio** supporting both headphones and speakers – with specific optimization for narrow speaker geometries on hand-held devices.

As a software solution, **microQ** offers the classic advantages of implementation flexibility, hardware independence, and low cost.

microQ represents the culmination of over twelve years of PC host and DSP audio software development and product deployment by QSound Labs, Inc., a world leader in sonic innovation.

microQ is based on the well-established QSound Virtual Engine™ (QVE) digital audio platform. QVE provides core processing and advanced sonic capabilities to such products as the "Edge" line of critically-acclaimed sound cards from Philips Consumer Electronics, and powers QSound Labs' own highly successful line of consumer PC audio applications.
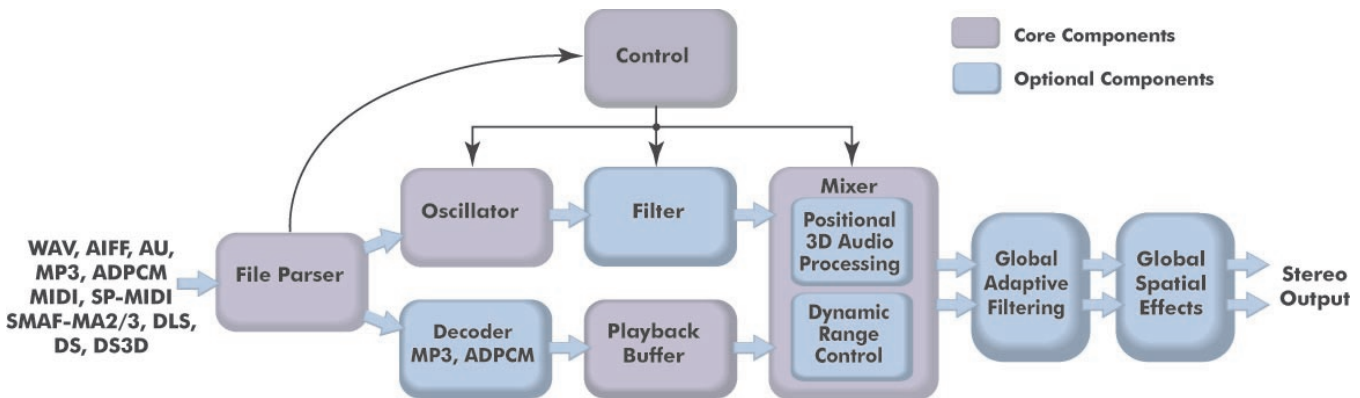
The flow diagram shows a representative configuration of **microQ** components. However, **microQ** architecture is a library of functional blocks that can easily be custom assembled into a multitude of combinations.

Features

- Highly flexible modular architecture.

- Small memory footprint and high efficiency.

- Supports industry-standard content formats.

- Highly efficient send modules direct audio streams to multiple locations.

- Flexible sub-mixers handle different channel counts and sample rates.

- Sophisticated dynamic range control provides normalization and/or soft-knee limiting.

- Proven track record and brand recognition.

- Flexible filtering capabilities range from basic tone control to the sophisticated dynamic frequency response enhancement of QSizzle™ and QRumble™ that restore sparkle and warmth to mp3 and other compressed audio formats.

- Proprietary QXpander™ 3D spatial processing literally adds new dimension to music playback, and Q3D™ full positional 3D audio mixing takes game play "outside the box," on both speakers and headphones.

- Speaker-targeted 3D processing is specifically optimized for narrow speaker geometries and can even be OEM-tuned for maximum impact with front, rear and side-firing speaker configurations.

Support for Standard Content Formats

microQ renders polyphonic sequenced content (MIDI, SP-MIDI, XMF, SMAF-MA2/MA3/MA5) with its native wavetable synthesizer sample set or using custom downloadable instruments (DLS, DLS 2.0).

microQ plays multiple digital audio formats, both linear (WAV, AIFF, AU) and compressed (IMA, Microsoft and Yamaha ADPCM, MP3).

Applications

microQ is ideal for a broad range of hand-held computing and communications devices, enabling and enhancing

- polyphonic ringtones
- game audio
- music playback
- sonic branding
- multimedia messaging
- voice recording

Platforms and Implementations

Inherently portable, **microQ** is written in highly-optimized C++ using fixed-point math*, featuring the combination of small footprint and high efficiency that is the hallmark of QSound audio platforms. (*C version also available.) Modular, scalable components make **microQ** readily adaptable to any target environment, with the requirement for platform-specific code reduced to input and output interfaces.

microQ is currently available for DSP and RISC hardware including ARM® and enhanced ARM architectures running Symbian OS® 7.0s (and above), Microsoft® Smartphone, PocketPC®, and PocketPC Phone Edition.

- Intel® XScale™ with/without Intel® Wireless MMX™
- Ceva TeakDSPCore®
- DSP Group TeakDSPCore®
- LSI Logic® ZSP™
- NeoMagic® MiMagic 6™
- TI® OMAP™

microQ can be provided in the form of object code, or custom ported by QSound Labs to suit your specifications.

microQ can be implemented at various system levels, e.g. within a driver, as a plug-in, or as a user application.

For Further Information

QSound Labs, Inc.

400 - 3115 - 12th Street North-East
Calgary Alberta Canada
T2E 7J2

Voice   +1-403-291-2492
Fax   +1-403-250-1521

Web   http://www.qsound.com

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*micro*Q *portable digital audio engine*   Product Overview v2.8 02 / 2004