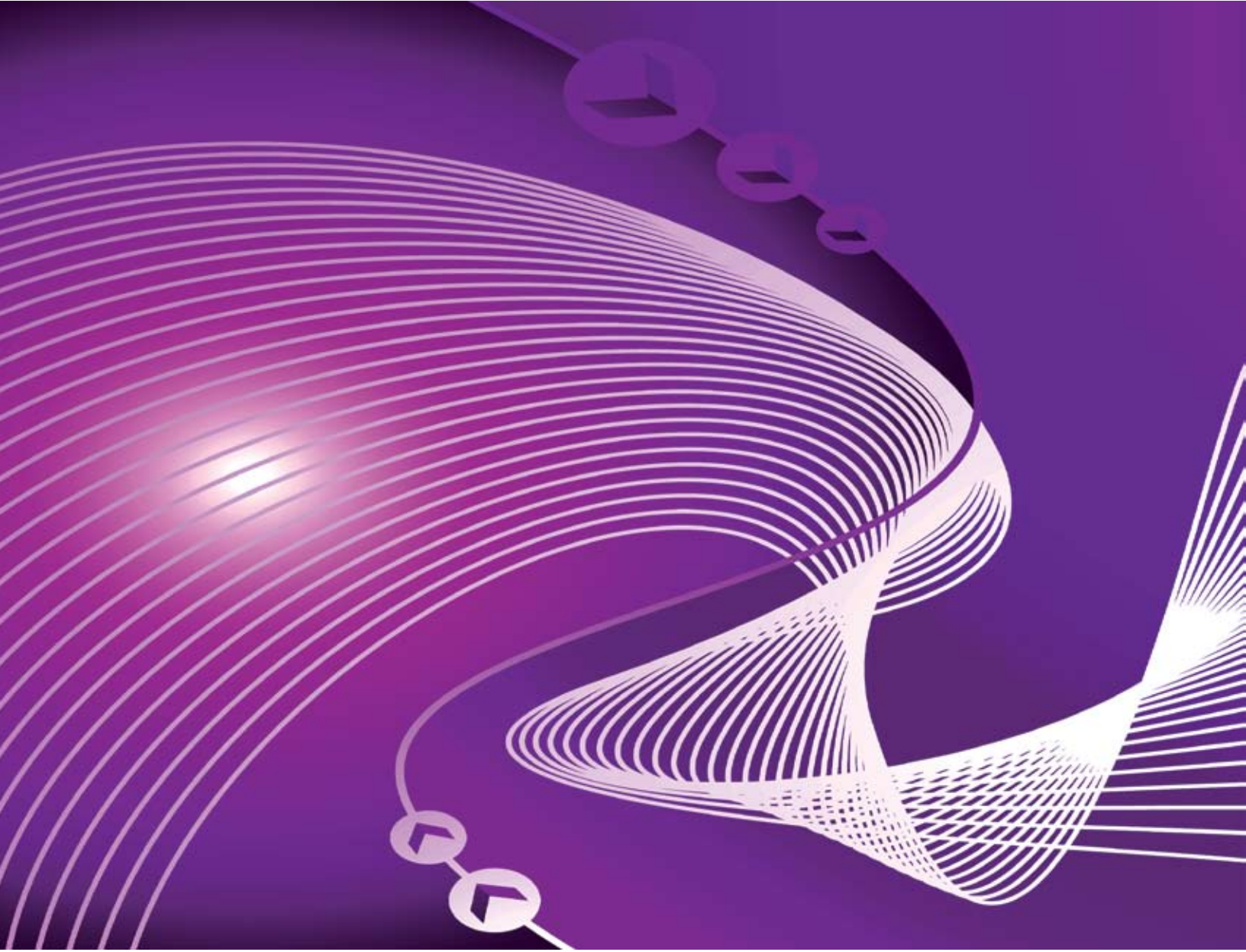
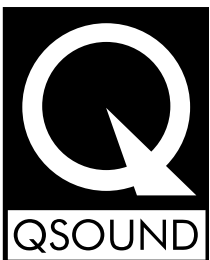


# QSound**Labs**



*market leading innovation in*  
**digital audio**



Corporate Profile

# hear the world's most advanced digital audio technology!



## Overview

QSound Labs, Inc. is a global supplier of audio software technology for mobile devices, headphones, Bluetooth headsets, televisions, stereos, PC multimedia equipment and other consumer electronics. QSound's proprietary audio algorithms truly deliver a fuller, more natural and immersive audio experience - users hear the difference!

QSound's sonic technologies, algorithms and special effects include:

- Polyphonic wavetable synthesizers
- Multi-speaker surround synthesis
- Surround sound virtualization
- 3D sound stage expansion
- Spectral enhancement
- Dynamic range control
- 3D positional audio
- Echo cancellation
- Noise reduction
- Anti-saturation
- Reverberation
- Equalization

Always on the cutting edge of audio innovation for new consumer products, QSound technology is today rapidly becoming a standard in the mobile and handheld device market. The **microQ®** digital audio engine includes an entire product suite, offering a state-of-the-art ringtone player, 3D positional audio and a range of digital effects capabilities which provide rich, high definition audio experiences for mobile device users. Whether it is to enable the phone to ring using microQ's **mQSynth™** or enhancing the music listening experience with microQ's digital audio effects **mQFX™** or enticing interactive gaming with **mQ3D™**, microQ is the leading mobile audio solution.

All QSound technologies are market tested and proven with over 20 years of experience implementing advanced audio solutions for diverse applications, ranging from the music recording industry to video games, movies, television programs, streaming Internet audio, MP3s and more. QSound's 3D positional audio and virtual surround sound technologies power the well established QSound branded products **QMSS™**, **QSurround HD™**, **QHD®** and **Q3D Interactive®** now found in millions of consumer electronic products.

As newer and more innovative consumer products requiring increasingly advanced audio technologies emerge, QSound continues to refine and develop its technologies to deliver the most effective audio solutions available for a continuously evolving global, digital lifestyle.

## Our History

Since its inception in 1986, QSound Labs, Inc. has become a world leader in audio enhancement technology, developing proprietary audio solutions that include virtual surround sound, 3D positional audio and stereo enhancement for the mobile devices, consumer electronics, PC/multimedia, and Internet markets.

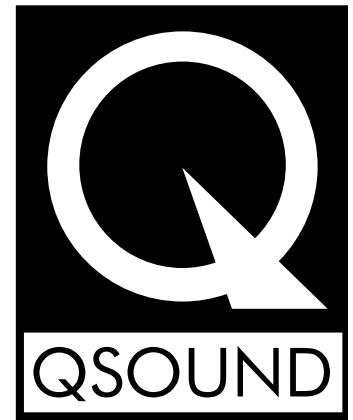
The earliest commercial applications of QSound technology were in integrated sound generation circuits for Capcom arcade video games and the multi-channel QSystem professional processor used in the production of pop music and film audio. Musical artists Pink Floyd, Paul McCartney, Sting, Madonna and others recorded their music to critical acclaim using this system and popular television shows such as The X-Files and Ally McBeal utilized QSound technologies during post-production.

QSound's strong experience and expertise in commercial audio applications have been a natural springboard to consumer side implementations. QSound technology delivers a rich and immersive audio experience regardless of how and where listeners enjoy electronically produced sound, be it via MP3, CD, DVD, radio, TV or internet broadcast, through earbuds, headphones, stereo or multi-speaker surround systems.

QSound's patented audio technology is currently used to enhance a wide variety of consumer electronics products in innovative ways. Our ever growing family of sonic algorithms includes active spectral enhancements, dynamic range control and wavetable synthesis, in addition to the proprietary spatial processes upon which the company was founded.

Delivered primarily in the form of software libraries, QSound I.P. is licensed to manufacturers of consumer electronics devices as well as to suppliers of integrated circuits and middleware. QSound algorithms may also be packaged as software plug-ins or self-contained end-user software for internet download.

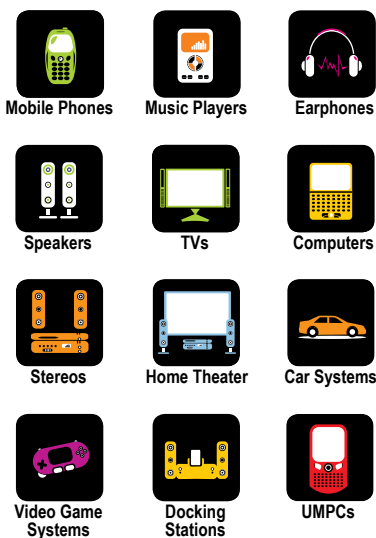
Audio solutions by QSound Labs have been rigorously optimized with the participation of major industry partners focusing on three critical requirements: quality, processing performance and memory footprint. Our customer and partner roster includes Aricent, ARM, Broadcom, CSR, LG, Panasonic, Pantech, Qualcomm, Samsung, Sony VAIO, Symbian, STMicroelectronics, Toshiba and many others.



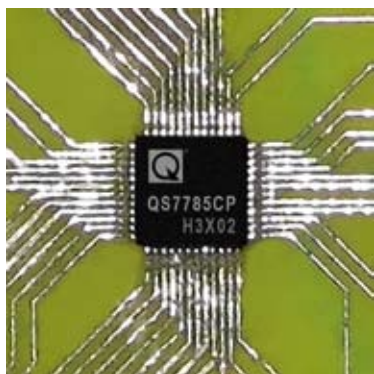
*Leading-edge audio  
technology solutions  
for the most natural,  
immersive 3D sound  
anywhere*



## Applications



*QSound technology has been integrated into over 150 million devices from mobile phones to consumer electronics, PCs, game consoles and more*



## Our Markets

### Mobile Devices

QSound meets the unique challenges of small geometry devices with its market leading **microQ** technology, allowing mobile users to experience rich audio entertainment anywhere. The microQ digital audio engine enables polyphonic ringtones, 3D game sound and enhanced music playback digital effects for any mobile device.

### Consumer Electronics and Computers

Stereos, headphones, speakers, DVD players, computers, TVs and home theater systems can all be enhanced by QSound's technologies. OEMs can choose from simple stereo-enhancement to full surround sound capabilities to offer a full range of audio solutions for any budget or product specifications

## Our Products

By working closely with our partners and OEMs we have developed a range of audio technologies to enhance a wide variety of products in the mobile, PC and consumer electronics markets.

### microQ®

A compact, modular and highly efficient software digital audio engine enabling polyphonic ringtones, 3D game sound and enhanced music playback with multiple effects for mobile devices.



### mQFX™

mQFX or "microQ effects" is a compact, high-performance software digital audio processing package that increases the audio impact of media players with a powerful set of enhancements.



### QSurround® Mobile

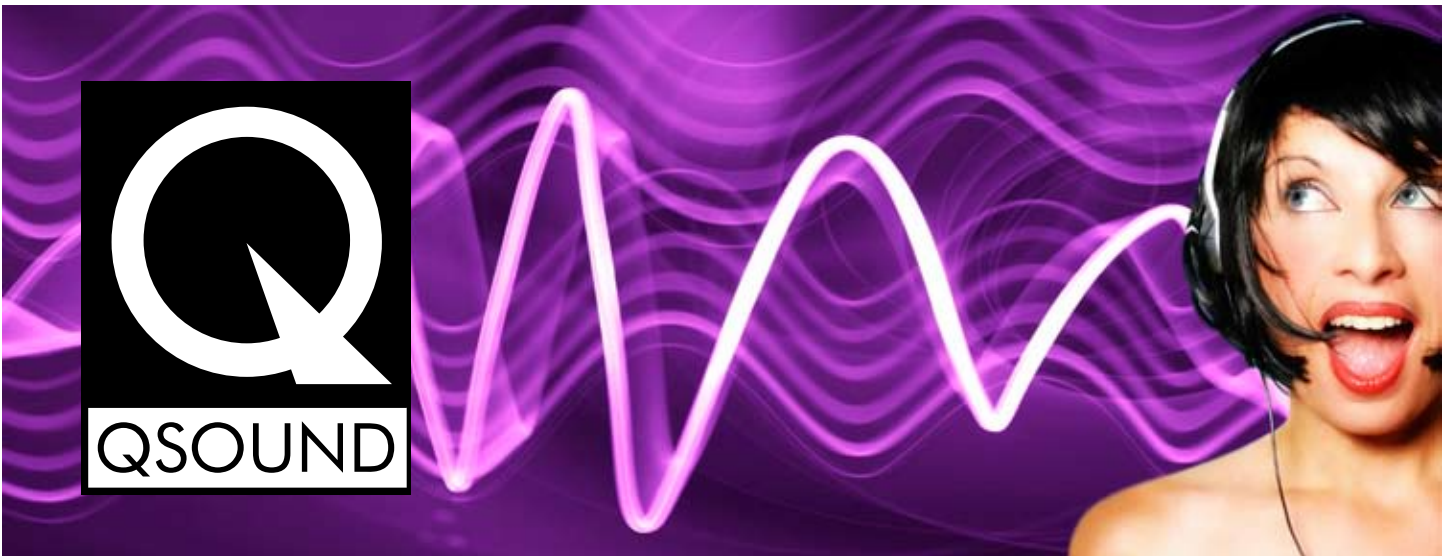
With a feature set and footprint optimized for mobile platforms, QSurround Mobile renders mono, stereo and multi-channel surround audio with maximum spatial impact over headphones and speakers.



### QVoice™

A high-quality, feature-rich noise reduction and echo cancellation software solution for speech enhancement in mobile phones, car phone systems and headsets. Can be bundled with mQFX, offering OEMs of **Bluetooth®** enabled products a complete voice and music enhancement Wireless Audio Solution from a single vendor.





### QHD®

This patented sound stage enhancement technology delivers unparalleled experience in 3D audio. QHD combines several audio technologies while addressing the unique demands of multi-format audio playback. Small software footprint is easily ported to virtually any host processor (CPU) or digital signal processor (DSP).



### QMSS™

A stereo-to-surround synthesis algorithm that creates a stunning surround effect with distinctly different outputs for four or five full range speakers from ordinary stereo program content. High quality, distinct outputs are generated for each speaker, rendering dramatic positioning without smeared sonic imaging.



### QSurround HD™

Surround virtualization process that delivers an impressive, expansive sound field. For conventional two-channel output over speakers, QSurroundHD creates a phantom center channel, enhances front-channel reproduction and creates virtual surround speakers to render all channels in their correct positions.



### Q3D Interactive®

Designed for professional audio recording and video game applications, Q3D Interactive technology places multiple individual sounds in specific locations outside the bounds of conventional stereo reproduction, providing true positional audio.



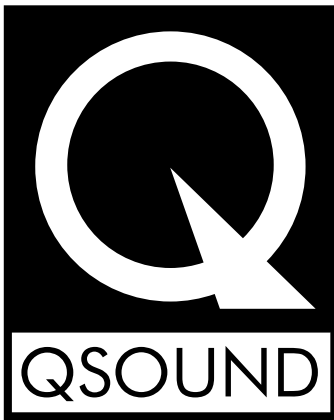
### Partners

QSound prides itself on partnering with major industry leaders worldwide to deliver superior, cutting edge audio technologies. Below is a partial list of our mobile market partners.

#### Mobile Phones

#### Mobile Partners





## ARM® - QSound® Collaboration

*"After evaluation of the QSound microQ technology, we found it offered the best combination of audio quality, performance and memory usage, resulting in a highly competitive solution.*

*In addition, the modular, component-based architecture creates a flexible solution which addresses the audio requirements of mobile handsets in a more scalable fashion."*

**ARM®** **Lance Howarth**  
General Manager  
Embedded Software



## Our Competitive Advantages

Since the pioneering development of the positional 3D audio process for speakers, QSound Labs has gone on to create the most comprehensive suite of audio and voice processes available, with superior solutions for every conceivable scenario. By offering such a wide suite of audio processes we can leverage this experience to help reduce the cost and resources required for our customers.

### Better Audio Performance

All QSound 3D audio processes are fine-tuned by skilled audio engineers for the most natural, pleasing sound experience possible. QSound 3D audio is characterized by superior focus and correct frequency balance, worthy of professional audio applications.

Competing processes can tire the listener with heavy-handed filtering that serves mainly to distract from muddy spatial performance and smeared imaging. In contrast, the sound stage produced by QSound is more natural-sounding than plain stereo and perceptibly alleviates listener fatigue, permitting comfortable and satisfying long-term use.

### More Robust Algorithms

QSound's speaker-targeted 3D processes are much more forgiving in the area of speaker/listener geometry than crosstalk cancellation systems. This means a much larger effective listening area and a great deal more flexibility in the placement of the speakers. Standard stereo audio gives the listener a very small "sweet spot" for true stereo listening. QSound offers a similar sweet spot for the best expanded audio effect, but will also enhance the listening experience for every person in the room regardless of their position relative to the speakers.

An additional benefit of the extensive acoustic design effort underlying QSound algorithms is their robustness in band-limited situations such as mobile audio applications. Though high frequencies are limited by low sampling rates and compact multimedia speakers limit bass response, QSound algorithms continue to create excellent effects.

### Higher Efficiency, Scalability

The efficiency of QSound's speaker algorithms is first due to the fundamental method of their derivation. The approach taken by competing speaker 3D processes, i.e. the application of crosstalk cancellation to binaural synthesis, is by nature inefficient. Furthermore, the efficiency of all QSound 3D algorithms is due to a thorough understanding of the relative importance of various independent factors contributing to the net result. This has made it possible to derive from a 'gold standard' algorithm a family of lower overhead versions, each exhibiting the most effective possible performance within their respective budgets.

Finally, QSound is a customer and technology focused company whose designers have a reputation for implementing a given algorithm by the most efficient method. Signal processing routines are written in hand-tuned assembly code by specialists adept at squeezing maximum value from each machine cycle.

### Flexibility and Speed of Implementation

QSound’s extensive software engineering experience means that algorithms are readily available on numerous platforms including popular DSPs and leading personal computer CPUs. Custom ports or custom features may be quickly provided and our customer support is highly acclaimed. In situations where digital processing is available, an algorithmic solution generally provides the most flexible and cost-efficient solution.

A growing suite of integrated circuits is available through our silicon partners for use in products that do not involve programmable digital signal processors.

### Licensing QSound Audio Technology

QSound technology is available for licensing in custom packages designed to meet your specific application needs. Our commitment is to deliver efficient and cost effective licensing and development processes to you as our partner.

QSound can provide design guides with detailed algorithm descriptions, object code or software libraries. Regardless of the path you choose, we back it all up with our expert technical integration assistance and verification support.

To explore the possibilities for integrating the world’s leading audio enhancement technology in your product and for more information on how to license QSound, contact our Sales team today.

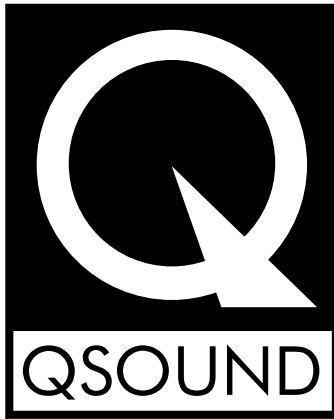
### More QSound Partners & Licensees



[www.qsound.com](http://www.qsound.com)



www.qsound.com



## Corporate Headquarters

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## Regional Offices

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