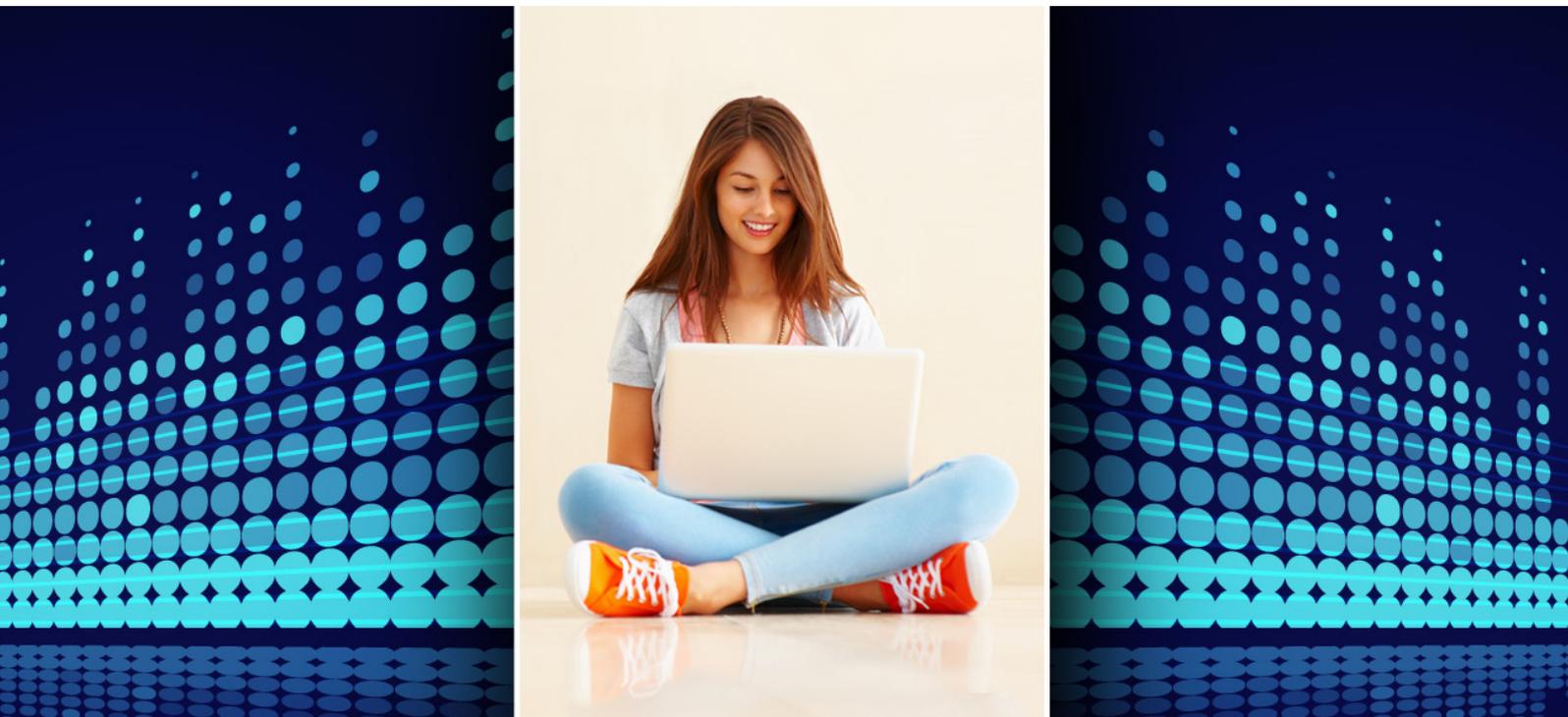




## PERFORMANCE ENHANCEMENT FOR AUTOMATIC SPEECH RECOGNITION



Waves MaxxSpeech is a suite of advanced technologies that improve the performance of Automatic Speech Recognition [ASR] applications, for flawless hands-free voice-controlled communication between users and their devices.

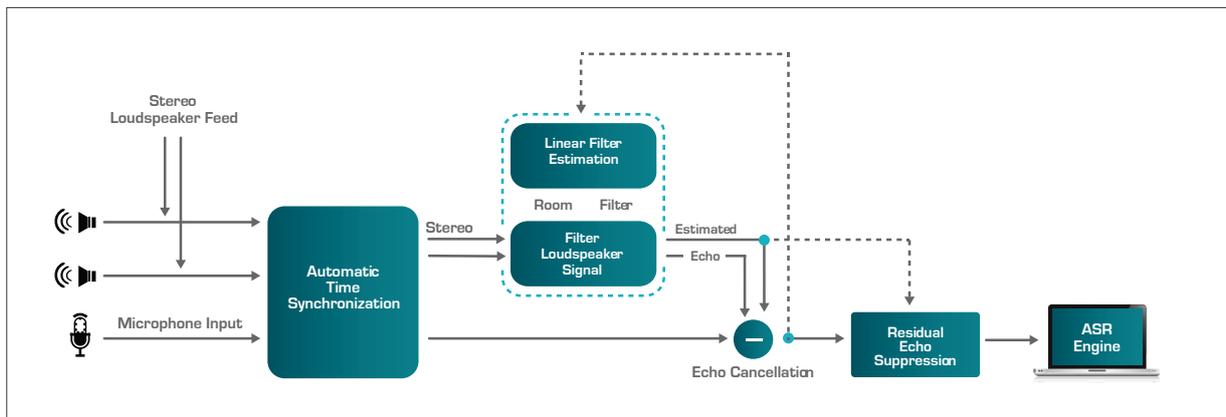
Today's technological advancements have changed the way people communicate with their devices, and each other. ASR – when it works – is an effortless means of interfacing with devices of all types. However, laptop and desktop users alike often find themselves in environments which are not especially hospitable to ASR performance. While the home and office settings have relatively stationary noise profiles, they are often less-than-perfect environments for ASR; public spaces offer entirely new noise challenges that make it nearly impossible for ASR engines to function.

That's why Waves created MaxxSpeech, a truly pioneering ASR performance enhancement solution. Comprised of three different noise reduction processors, each of which addresses a specific ASR challenge, MaxxSpeech provides a solution for real-life scenarios so users can communicate freely with their devices and take their perceptual computing experience to the maximum.



## **MAXxEC™** | STEREO ECHO CANCELLATION

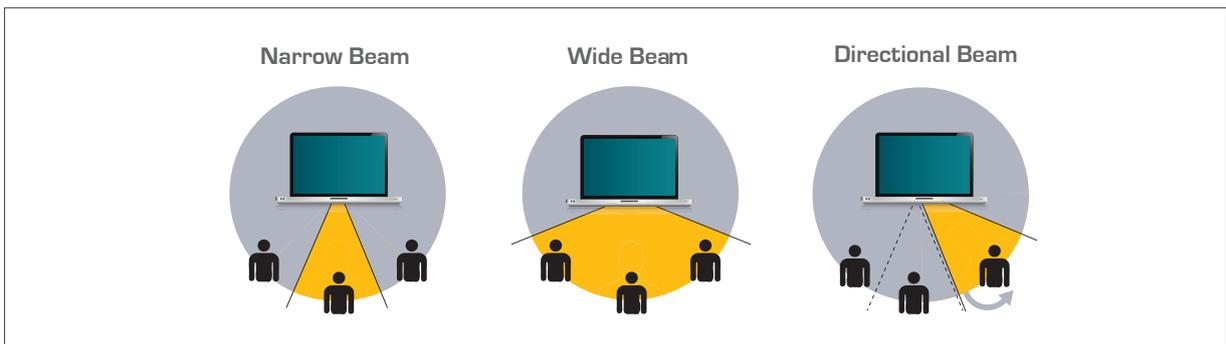
MaxxEC is a true full-duplex echo canceller that utilizes proprietary algorithms originally developed for the music and post production industries to reduce echo leak and room reverberation, without adding processing artifacts that can make voices sound unnatural. MaxxEC Automatic Rate Conversion supports non-matching near/far end inputs while maintaining CPU power-saving performance. Thanks to MaxxEC, conversations sound like they should, with the focus on primary voice signals.



## **MAXxBEAM™** | MICROPHONE-ARRAY NOISE SUPPRESSION

MaxxBEAM directional noise reduction for integrated microphones overcomes the challenges of noisy environments to capture crystal-clear, intelligible voice signals. Based on microphone-array technology, MaxxBEAM differentiates between the desirable signals inside the “beam” and undesirable sounds outside of it, suppressing both stationary and non-stationary noise from outside the beam.

MaxxBEAM’s Auto Beam feature is a non-static, directionality steering function which enables the beam to track and locate the main speech source, giving users the freedom and flexibility to communicate anywhere and everywhere through their device. Honing in not just on the speaker, Auto Beam also controls the width and scope of the beam automatically, gradually adjusting to the user’s position and focusing in on their voice to deliver a clear, pure signal.

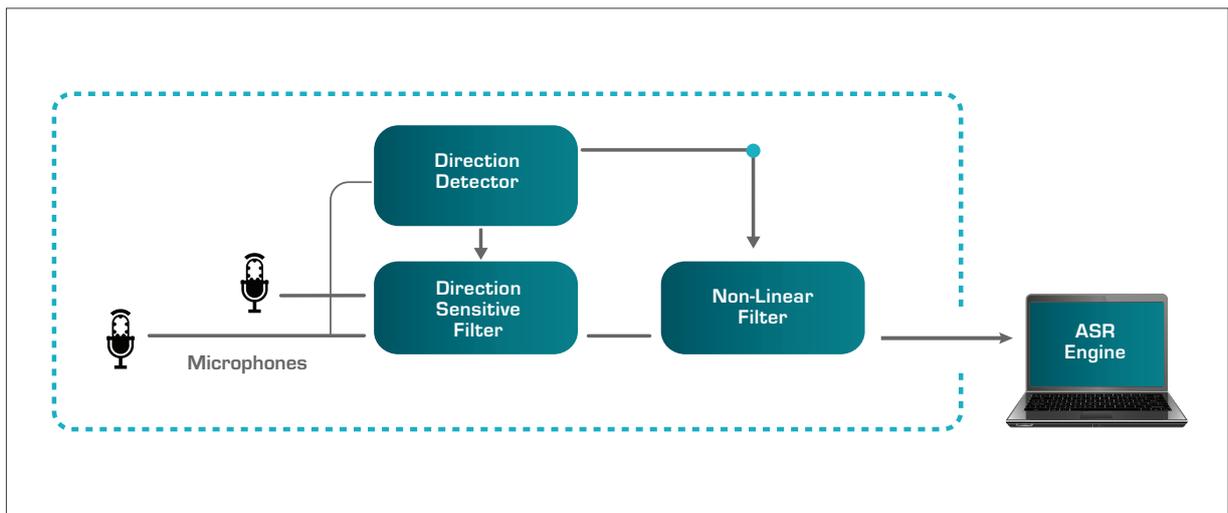




## **DEBABBLE™** | DIFFUSED NOISE REDUCTION

Waves DeBabble is a patent-pending diffused noise attenuator that leverages Waves' renowned noise reduction and source localization technologies to provide a purer, more precise signal, so the ASR engine can accurately identify user commands. With a direction-sensitive filter optimized for automatic speech recognition performance, DeBabble detects and tracks the main speech source and then assumes all other speech-like sources are unwanted environmental babble.

DeBabble operates in real-time by applying linear and non-linear directional filters, both controlled by the detected direction of speech, suppressing selected frequencies in the unwanted noise and speech sources, so as to minimize their effect on the ASR engine's performance. DeBabble's directional filter has been trained on ASR engines for maximum Command Acceptance Rate and minimum Word Error Rate. DeBabble works like a dedicated compass that automatically knows where the user is.



## **MAXX SPEECH™** | SUMMARY

The MaxxSpeech latest generation of features was designed with one key goal- to change the perceptual computing experience of users and the way they interact with their devices. Using extremely intricate processors while maintaining CPU power-saving performances, MaxxSpeech not only increases command acceptance rate and reduces word-error-rate, but also provides a real-life solution for flawless hands-free communication between users and their devices.

With adaptive noise filters, innovational echo cancellation and precise beam-forming, MaxxSpeech three primary technologies bring forth a turn-key solution for ASR engines with easy integration and no bundled hardware requirements.



## KEY MAXXSPEECH BENEFITS

Increases  
command acceptance

Reduces  
word error rates

Optimized  
for real-life  
environments

Support  
for multiple microphone  
types and placements

Automatic  
real-time  
configuration

No bundled  
hardware required

## ABOUT WAVES AUDIO

Waves is the world leading developer of DSP technologies for pro audio, live sound and consumer electronics, heard on popular music, hit movies and top-selling video games the world over.

Waves received a Technical GRAMMY® award for its outstanding contributions to the recording industry. Now, Waves professional sound tools are available for consumer electronics devices.

**Because Sound Matters.**



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