



MaxxBass[®] Changes the Design Rules for Subwoofers

Waves and Redrock Acoustics demonstrate how to redesign subwoofers to reduce size and costs >50% enabling new product categories

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WAVES LTD., a leading supplier of psycho-acoustic audio signal processing solutions for the professional, broadcast and consumer electronics audio markets, in cooperation with Redrock Acoustics, a respected loudspeaker design firm, today presented at ALMA International, World Cone Symposium a design breakthrough in subwoofers . Waves patented MaxxBass[®] psychoacoustic bass extension technology, when used in the design of a subwoofer can dramatically shrink the size and cost of subwoofers by more than 50% enabling entirely new subwoofer product categories.

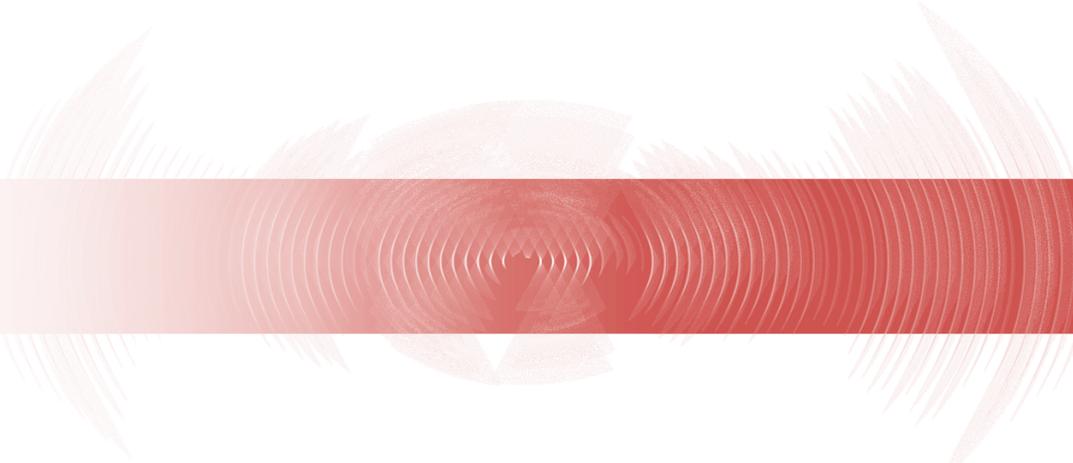
Generating loud and low bass is the most difficult and costly goal in loudspeaker design. The laws of physics require large speaker enclosures and high power to generate loud and deep bass. MaxxBass utilizes the proven psychoacoustic Phenomenon of the Missing Fundamental to “trick” listeners into hearing up to 1.5 octaves of bass frequencies below the physical limits of the speaker. When applied to design of subwoofers, the new subwoofer low frequency roll-off (f3) can be increased about an octave, for example from 50Hz to 100Hz. This allows manufacturers to shrink the size of the subwoofer by about 75% to the size of a small bookshelf speaker. Unlike other technologies MaxxBass simultaneously allows the system efficiency to be improved, reducing amplifier cost and/or increasing maximum volume levels. The combination of lower material costs, less expensive amplifiers, and reduced shipping is estimated save manufacturers more than 50% on a mass market home theater style subwoofer.

“MaxxBass enabled subwoofer designs, does more than reduce the size and cost of subwoofers.” stated Paul Bundschuh, Vice President, Sales & Marketing, Waves Semiconductor and OEM Licensing Division. “It enables manufacturers to deliver low and loud bass into a new range of audio products. Some of these include automotive underseat subwoofers, multimedia desktop subwoofers, and thin profile wall mountable subwoofers that can mounted under flat panel televisions.” Waves is calling this new category of subwoofers, MinWoofers™.

“MaxxBass enables phenomenal improvements in subwoofer design,” stated Patrick Turnmire, President of Redrock Acoustics. “The engineering doesn’t change, just the speaker targets, since MaxxBass can be used to fill-in over of octave of bass response.” Patrick implemented several custom MaxxBass enabled subwoofers that were demonstrated to loudspeaker engineers at ALMA International. Waves and Redrock Acoustics also announced that they are working with a major Chinese speaker company to produce a reference design for several of these MiniWoofers™, which will be available in both sample and production quantities.

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It is straightforward process for loudspeaker designs to reoptimize their subwoofers using Redrock Acoustic's SpeaD and RevSpeaD loudspeaker design software. The technical paper presented at the show detailed performance targets of a MaxxBass enabled subwoofer to a traditional subwoofer design with similar acoustic response.

Waves is the leader in computer based audio signal processing tools in the professional market, and its tools such as limiters, equalizers, compressors and effect processors are used on practically every top album and movie soundtrack. Ten years of leadership experience with this very quality conscious market has allowed Waves to develop a rich expertise to psycho-acoustics, including the patented MaxxBass technology. MaxxBass is a bass frequency extension technology that extends the perceived low frequency response by up to one and one half octaves below the physical low frequency cut off of a loudspeaker system. MaxxBass utilizes the psycho-acoustic Phenomenon of the Missing Fundamental. The MaxxBass software "plug-in" tool is commonly used today in mastering much of the world's most popular music to improve mix compatibility on smaller loudspeaker systems; however using MaxxBass in loudspeaker systems is even more powerful, since it can be optimized to extend the bass response of the specific loudspeaker system.

Waves recently introduced the MX3000AS, a low cost ASIC (Application Specific Integrated Circuit) for MaxxBass making this technology cost-effective for consumer electronic products. This ASIC integrates high quality analog, sigma delta A/D/A and a custom DSP into a 16-pin SOIC package. Datasheets and other information is available at www.maxx.com.

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About Waves Ltd.

Waves is a leading provider of audio DSP solutions for professional, broadcast, and consumer electronics audio markets. Waves has ten years of expertise in the development of psycho-acoustic signal processing algorithms that leverage knowledge on the human perception of hearing to radically improve perceived sound quality. Waves award-winning processors are utilized to improve sound quality in the creation of the world's most popular music, movie sound tracks and multimedia titles. Waves offers computer software solutions and hardware plus software solutions for the professional and broadcast markets. Waves also offers semiconductors with embedded software solutions under the Maxx brand for the consumer electronics audio applications. Waves' Maxx technology dramatically enhances audio performance in consumer applications and has been licensed to several leading companies, including Motorola and Microsoft. For more information, visit Waves Web site at <http://www.waves.com>.

About Redrock Acoustics

Redrock Acoustics is a leading design consulting firm focused on acoustics and electronics of speaker systems. They have designed over 500 speaker products for the US market in the past 6 years. Redrock Acoustics designed products have won a large number of industry awards including CES Innovations and Grand Prix awards. Their products can be found in every US car audio store, car audio magazine and audio retail catalog. For more information, visit the Redrock Acoustics website at <http://www.redrockacoustics.com>.