

**SPECIAL
FEATURES**

Loudspeaker Industry Status • Q&A with Industry Leaders •
Emerging Audio Technologies • Morel Turns 40 • Loudspeaker and Headphone
Market Trends • 25 Years of aptX • A New Industry Trade Show

\$20.00

2015 LIS

LOUDSPEAKER INDUSTRY SOURCEBOOK

- **ACOUSTIC SOLUTIONS**
- **COMPONENTS**
- **DESIGN SOFTWARE**
- **DRIVERS**
- **EARPHONES & HEADPHONES**
- **ENCLOSURES & CABINETS**
- **FINISHED SYSTEMS & INTEGRATED PRODUCTS**
- **MANUFACTURING EQUIPMENT**
- **MEASUREMENT MICROPHONES**
- **MICROSPEAKERS**
- **MODULES**
- **SPEAKER PARTS**
- **TEST EQUIPMENT**

An Annual Sourcebook from the Publisher of *Voice Coil* and *audioXpress* —
Continuously updated and available at www.audioxpress.com



Cover Sponsor

Speaker Test Solutions

Exel handheld instruments

The MR-PRO and XL2 instrument set offers an easy-to-use combination for reference measurements, performance verification and trouble shooting.

A few of the features for speakers:

MR-PRO

- Sine, Noise and swept/stepped signals
- Also measures impedance of connected device
- 70/100V power calculation & opt. protective adapter

XL2

- Both Acoustic and Audio measurements
- 1/1, 1/3 octave RTA (opt. 1/6 & 1/12)
- FFT spectrum analyzer
- THD+N, Level, Frequency
- Delay; Polarity; Scope mode



MR-PRO
Professional analog
audio signal generator



XL2
Hand Held audio
and acoustic analyzer

High performance production line testing



Proven PureSound™ technology

Reliably detects any audible defects with maximum hit rate. Parallel analysis of up to four channels.

Modular Analyzer architecture

Customize your speaker or mic test system by choosing the number of analysis channels, built in impedance & coil resistance measurements, switchers, MEMS mic interfaces, polar plots for mics, environmental sensors, etc.

Cost efficiency

Optimized system configuration limits your investments to the needs of your application only.

Maximum test speed

Very fast glide sweep technology measures all quality parameters from a single stimulus within a fraction of a second.

FX-Control software

Powerful and complete system control suite supports flexible GUI designs, built-in limits handling and sequenced measurements.



crystal clear.



New 5" planar wave driver

The new BMS 4505ND planar wave driver radiates a coherent planar wave front from a rectangular piston without internal diffraction for superior dispersion control and high fidelity sound. This distinctive new transducer was engineered to work with 5-inch (5" x 1/2") rectangular throat waveguides, providing extremely high sensitivity. The unique design of the 4505ND planar wave driver allows perfect acoustical coupling of individual units to create a virtually continuous line source. The driver contains a high energy neodymium magnet system and a unique annular diaphragm, providing linear frequency response up to 20 kHz.

Innovative driver solutions

European finest quality drivers for professional and high-end loudspeaker applications

Worldwide largest manufacturer of premium compression drivers

Ultra low distortion cone drivers	Coaxial compression drivers	Annular diaphragm compression drivers	Point Sources	EUROPEAN HIGH QUALITY SPEAKERS	
				BMS Speakers GmbH Hannover – Germany www.bmsspeakers.com	

NEW RELEASES



satori® TW29RN

(Also available with all black faceplate)

Nominal Impedance	: 4 Ω
DC-resistance, R_e	: 3.2 Ω
Resonance frequency, f_s	: 700 Hz
Piston area, S_d	: 9.6 cm ²
Sensitivity (2.83 V/1 m)	: 97 dB
V.C. diameter	: 29 mm
Rated power handling	: 80 W

- Non-resonant diaphragm design for minimum high frequency break-up
- Two part aluminum faceplate with integrated mechanical decoupling
- Dual balanced compression chambers for improved dynamics
- Dual copper caps for absolute minimum voice coil inductance and minimum phase shift
- High saturation neodymium motor system with T-shaped pole piece for lower distortion
- Non-reflective cast aluminum chamber with optimized damping for improved dynamics
- Shallow flow optimized magnet structure for optimum coupling to rear chamber
- CCAW voice coil for low moving mass
- Long life silver lead wires
- Low resonance frequency for extended range



sbacoustics SB29SDC

Nominal Impedance	: 4 Ω
DC-resistance, R_e	: 3.2 Ω
Resonance frequency, f_s	: 580 Hz
Piston area, S_d	: 9.6 cm ²
Sensitivity (2.83 V/1 m)	: 93 dB
V.C. diameter	: 29 mm
Rated power handling	: 100 W

- Fine weave soft fabric dome for smooth frequency response
- Large surround area for better high frequency dispersion
- Dual balanced compression chamber for improved dynamics
- Copper cap for reduced voice coil inductance and minimum phase shift
- Saturation controlled motor system for low distortion
- Non-reflective rear chamber with optimized damping for improved dynamics
- Flow optimized vented pole piece for optimum coupling to rear chamber
- CCAW voice coil for low moving mass
- Long life silver lead wires
- Low resonance frequency



sbacoustics 6" SB17CRC35-8

(Also available in 4 Ω)

Nominal Impedance	: 8 Ω
DC-resistance, R_e	: 5.7 Ω
Resonance frequency, f_s	: 29 Hz
Total Q-factor, Q_{ts}	: 0.35
Equivalent volume, V_{as}	: 40 liters
Piston area, S_d	: 118 cm ²
Sensitivity (2.83 V/1 m)	: 87 dB
V.C. diameter	: 35.5 mm
Linear excursion, X_{max}	: ± 5.5 mm
Rated power handling	: 60 W

- Rohacell®/Carbon fibre sandwich cone for optimized stiffness/damping ratio
- Vented cast aluminum chassis for optimum strength and low compression
- Low damping rubber surround for improved transient response
- Non-conducting fibre glass voice coil former for minimum damping
- Extended copper sleeve on pole piece for low inductance and low distortion
- CCAW voice coil for reduced moving mass
- Long life silver lead wires
- Vented pole piece for reduced compression



sbacoustics 8" SB23MFCL45-4

(Also available in 8 Ω)

Nominal Impedance	: 4 Ω
DC-resistance, R_e	: 3.3 Ω
Resonance frequency, f_s	: 27 Hz
Total Q-factor, Q_{ts}	: 0.36
Equivalent volume, V_{as}	: 39.2 liters
Piston area, S_d	: 208 cm ²
Sensitivity (2.83 V/1 m)	: 87.5 dB
V.C. diameter	: 45.5 mm
Linear excursion, X_{max}	: ± 11.7 mm
Rated power handling	: 120 W

- Long stroke design
- Linear high stability suspension
- Low damping rubber surround
- Long copper voice coil
- Non-conducting reinforced fibre glass coil former
- Very stiff mineral filled Polypropylene cone
- Vented cast aluminium chassis
- Large vented motor system
- Long life silver lead wires
- Optimized for smaller enclosures

further information :

- www.sbacoustics.co.id
- www.sinarbajaelectric.com
- OEM contact : mkt@sinarbajaelectric.com

www.facebook.com/sbacoustics



LOUDSPEAKER INDUSTRY SOURCEBOOK

THE TEAM

PUBLISHER: Hugo Van haecke
PRESIDENT: Steve Ciarcia
INTERNATIONAL EDITOR: João Martins
MANAGING EDITOR: C. J. Abate
ASSOCIATE EDITOR: Shannon Becker
ART DIRECTOR: KC Prescott
CUSTOMER SERVICE: Debbie Lavoie
ADVERTISING COORDINATOR: Kim Hopkins

2015 CONTRIBUTORS: Jayant Datta, Vance Dickason,
Lars-Olof Janflod, Mike
Klasco, Jon McClintock, Nir
Paz, Bennett Prescott, Shawn
Scarlett, Christopher J. Struck,
Alan Trevena, Barry Vogel, Jack
Wetherill

THE NETWORKS



About the Cover Sponsor

ADVERTISEMENT

Morel was established in 1975 by Meir Mordechai—inspired by his love of music and motivated by a dream—to create a loudspeaker that would capture the magic in music in the most natural way. Over the years, Morel has developed an enviable reputation for technological innovation and design excellence. The company's drivers are utilized worldwide in some of the most demanding, high-end products.

To deliver that magical feeling, Morel is renowned for more than just advanced technology and the latest industrial tools. The human touch is an absolute necessity. Each Morel product is hand assembled and extensively tested to ensure that it meets the highest standards. The personal knowledge and proprietary advancements, gained by Morel's dedicated team over four decades of experimenting with sound, permeate all its products. Having its in-house design, R&D, and manufacturing all under one roof enable Morel to deliver unprecedented quality. Unlimited by design constraints and with years of experience in making its own drive units, Morel offers the latest acoustic technologies, which provide a lifetime of musical enjoyment for our customers. Morel products and sound systems are sold in the home hi-fi, home theater, and mobile audio markets in more than 55 countries worldwide.

Morel celebrates its 40th anniversary with new innovations—moving forward

with its vast experience and know-how. One of the latest innovations is the Titanium Series. Now, the company integrates the titanium former technology also found in its Ultimate Subwoofer line and Supreme Carbon woofers. The new range benefits from the titanium inherent characteristics that deliver enhanced linearity, superior transient response, greater dynamic range, and higher power handling, which fit into a wider selection of enclosure types and sizes. The Titanium Series exhibits exceptional high-quality musical performance.

Another innovation is the new ultra slim 6—a 6" mid-bass driver that is less than 1" deep—made to be used in numerous applications where miniaturized speakers and high-performance quality are required. The new Integra line (seen on the cover) provides excellent directivity on and off axis, high power handling, and a natural sounding performance. It is a great solution for Atmos-compatible speaker design.

—Morel, Ltd.

Cover photo courtesy of Morel



2015

The Loudspeaker Industry Sourcebook is an annual publication by Segment LLC, Hugo Van haecke, publisher, at 111 Founders Plaza, Suite 300, East Hartford, CT 06108 USA. Postage paid at East Hartford.

Head Office:
Segment, LLC
111 Founders Plaza, Suite 904, East Hartford, CT 06108
Phone: (860) 289-0800

Fulfillment:
Loudspeaker Industry Sourcebook
P.O. Box 462256
Escondido, CA 92046
E-mail: voicecoil@pcspublink.com
Phone: (800) 269-6301, Internet: www.audioamateur.com
Address Changes/Problems: voicecoil@pcspublink.com

US Advertising:
Strategic Media Marketing, Inc.
2 Main St.
Gloucester, MA 01930 USA
Phone: (978) 281-7708
Fax: (978) 281-7706
E-mail: peter@smmarketing.us
Advertising rates and terms available on request.

LOUDSPEAKER INDUSTRY SOURCEBOOK

SUPPORTING COMPANIES

AAC—Applications Acoustiques de Composites	105	JLI Electronics	66
ACO Pacific, Inc.	123	Klippel GmbH	122
Acoustics First Corp.	51	Kmaxima Group.	84
ALMA International	142	LaVoce Co., Ltd.	78
Arizona Capacitors, LLC	98	LOUDSOFT, Ltd.	119
ATE (Audio Technology Engineering)	43	Loudspeaker Components, LLC.	104
AUDAX	85	LPG (Lautsprecher Produktions Gesellschaft) mbH.	81
Audio Precision.	121	Maeden Innovation Co., Ltd..	111
Audiostar Electronics Co., Ltd.	117	Materion	116
B&C Speakers S.p.A	73	Menlo Scientific, Ltd.	127, 134, C3
Bennic and Company.	99	MISCO Speaker Co.	87
BeStar Technologies, Inc.	80	Morel	C1, 74
BESTON Technology Corp.	82	NTI Americas, Inc.	C2
Beyma Professional Loudspeakers	93	Oberton Professional Loudspeakers.	90
BMS Speakers GmbH	1	One Magnet Electronic Co., Ltd.	114
Celestion	86	Pacific Audio Consulting.	42
Creative Sound Solutions	88	Parts Express	6
Danville Signal Processing, Inc.	42	PCB Piezotronics, Inc..	65
Eastern Asia Technology, Ltd..	79	Precision Converting, a Division of HISCO, Inc.	113
Eighteen Sound	71	Precision Devices.	83
Eminence Speaker, LLC	C4	Precision Econowind	115
ETANI Electronics Co., Ltd.	55	Reckhorn, Ltd...	88
EuroTec International plc	90	SB Acoustics.	3
FaitalPro.	76	Solen Electronique, Inc.	101
Fane International.	89	Suzuki Kanshi (Thailand) Co., Ltd.	116
Ferrotec Corp.	107	Transducer Lab.	82
Fluid Metering, Inc.	108	Trueanalog International., Ltd..	91
Fountek Electronics Co., Ltd..	77	TSG Audio.	59
Globe Plastics, Inc..	47	Tymphany	75
G.R.A.S. Sound & Vibration	120	Vance Dickason Consulting..	130
Hernon Manufacturing, Inc.	106	Volt Loudspeaker, Ltd.	80
Hill Acoustics, Ltd...	125	Wavecor, Ltd..	72
Huey Tung International Co., Ltd.	92	Zhuhai HiVi Technology Co., Ltd.	95
Jantzen Audio Denmark.	97		

Not a supporting company yet?

Contact Peter Wostrel (peter@smmarketing.us), Phone (978) 281-7708, Fax (978) 281-7706
to reserve advertising space in the *Loudspeaker Industry Sourcebook* for 2016.

Editorial Inquiries

Send editorial correspondence and manuscripts to:
Loudspeaker Industry Sourcebook, Editorial Dept.
111 Founders Plaza, Suite 300, East Hartford, CT 06108
E-mail: editorial@audioXpress.com

No responsibility is assumed for unsolicited manuscripts. Include a self-addressed envelope with return postage. The staff will not answer technical queries by telephone.

Legal Notice

The content in this publication is offered to readers for their personal use only. Any commercial use of such ideas or designs without prior written permission is an infringement of the copyright protection of the work of each contributing author.

Some companies did not complete a listing request, but their relevance in the loudspeaker industry should be noted. Segment, LLC is publishing these listings as a courtesy to contributors of the loudspeaker industry and is not responsible for any error or omissions to the directory listings/ company information.



© Segment LLC 2015

Printed in the United States



CONCEPT TO PRODUCTION

When competitiveness and expertise are needed, large and small OEMs turn to Parts Express for assistance with product development.

Drivers



Subwoofer Amps



Cabinets



Crossover Parts



Cabinet Accessories





Over 18,000 products in stock—order your FREE catalog today!

1-866-366-4909

parts-express.com/wholesale

725 Pleasant Valley Drive Springboro, OH 45066 USA

LOUDSPEAKER INDUSTRY SOURCEBOOK 2015

About This Issue

The *Loudspeaker Industry Sourcebook*, an annual publication that lists speaker-related companies and their products and services, provides a comprehensive guide throughout the year for your loudspeaker needs. You can also access the information online. Go to www.gotomyliis.com to see the 2015 edition or visit www.audioexpress.com/lis to view the most up-to-date vendor listings.

The user-friendly resource includes lists that identify products and services from approximately 250 companies. To contact a manufacturer, distributor, or consultant directly, refer to the extensive address list, which includes each company's information.

If you're curious about where the industry is headed in 2015 and beyond, the sourcebook contains interesting and informative articles. Discover what experts who serve on the ALMA International's Board of Directors have to say about the state of the loudspeaker industry. Then, read what Alan Trevena, chairman of Audio Engineering Society's Technical Committee on Loudspeakers and Headphones, has to say about the industry.

Review the differing formats people use to listen to music and debate whether people will actually make the switch to all-digital sources in an article by Jack Wetherill, of FutureSource. Next, Jon McClintock discusses "25 Years of aptX," in an article about this audio codec that he says has revolutionized the industry, from communications to the Bluetooth stereo listening experience.

Then, learn a bit more about Israel-based Morel, our cover sponsor, who is celebrating 40 years in the audio industry. And explore a new industry trade show, "The Loudspeaker Sourcing Show," developed by its founder Philip Richardson.

Also, learn what some of our audio professionals have to say about relevant industry topics, including some of the most significant challenges faced today, in our special Question & Answer section. So enjoy.

Information within the *Loudspeaker Industry Sourcebook* relies on manufacturers to fill out our online form. While we seek to ensure the information presented inside is as accurate and comprehensive as possible, Segment publishes the listings as a courtesy and is not responsible for any errors or omissions to the directory listings/company information. Listings can be submitted online throughout the year. However, any information submitted after May 15, 2015, does not appear in the 2015 printed publication. To be included online and in subsequent issues:

Loudspeaker Industry Sourcebook
Segment, LLC
111 Founders Plaza, Suite 904
East Hartford, CT 06108
(860) 289-0800
Fax (860) 461-0450
www.audioexpress.com

2015 Loudspeaker Industry Sourcebook

Loudspeakers— The State of the Industry

As Seen by the Board of Directors of ALMA International



By
Barry Vogel

(ALMA International Association Manager)

In an industry where the term “new” lasts for mere moments, loudspeakers have been a relative constant. Much of the innovation in the loudspeaker category stems from advanced materials and aggressive designs coupled with advanced enclosure design and digital sound processing. Indeed, it seems as though much of the excitement being generated in loudspeaker design is coupled with DSP, wireless technology and continuing improvements in microspeaker technology and performance.

That said, the loudspeaker and acoustics industry remains dynamic and an integral component in the sound chain. Until someone develops a viable digital solution to excite air to create quality sound, the analog world will continue to influence the digital world and vice versa.

The Association of Loudspeaker Manufacturing and Acoustics (ALMA) International is a not-for-profit trade association dedicated to improving the design and manufacture of loudspeakers. ALMA is the source of standards, news, networking, and education for technical and business professionals in the acoustics, audio, and loudspeaker industry.

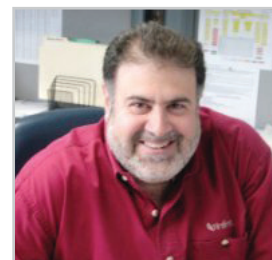
Recently, ALMA International’s Board of Directors were asked to provide their opinions with regard to the loudspeaker and acoustic

industry’s current state and its future. Here are their responses.

Spiro Iraclianos, President of ALMA International

The loudspeaker industry is a very mature segment of consumer electronics. Whereas innovation and technology have driven consumer electronics advances including DSP, wireless technologies, and others, loudspeakers have remained fundamentally unchanged for decades. While there have been some innovations, they have proven too costly to warrant wide acceptance. This has led to a commoditization of the category driving down prices and profits and the proliferation of “me too” products. Some of questionable value.

The future belongs to those who continue to innovate and seek new solutions to old problems. New materials and methods to move air as well as methods to further improve efficiency and performance will keep the category relevant and moving forward.



Mark Beach, Vice President of ALMA International

In a mature industry such as the loudspeaker industry, we see even inexpensive low-margin loudspeakers that are good enough for the majority of consumers. This tends to push up the cost of audiophile and high-end systems to recoup needed profit. It also creates a conundrum in that some consumers who might step up to a higher quality product are effectively priced out of it.



Loudspeaker engineers have actively increased training and skills enhancement and are applying those skills to loudspeaker design at all levels, which enables more inexpensive loudspeakers to perform better. The active involvement of so many engineers at ALMA's Winter Symposium who gave and attended seminars and presented papers is a testament to the ongoing education.

In the future, the challenges focus more on consumer education than most other issues. There is vastly improved interest in sound quality, and studies prove consumers are willing to pay for it. So far, however, the industry is failing to educate the consumer as to what sound quality is. In that environment, low-grade MP3 and earbuds win. The future belongs to loudspeaker manufacturers that do a better job of teaching consumers what "great sound" really is. Without this type of consumer education, we will continue to see a commoditization of the category and continuing decline in profit margins.

Alan Babb, Board of Directors of ALMA International

To adapt some of the words of the POTUS, the state of our industry is strong. The advances in measurement systems and computer modeling packages have provided new avenues for engineers to optimize transducers and systems. That is both a blessing and a curse. For some, it means they can quickly make large strides forward in quality. For others, it means the quality gap between them

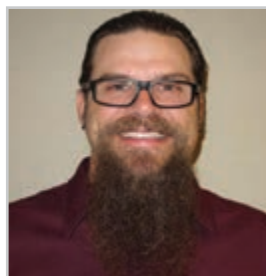


and their competition narrows, closes, or even reverses itself. For the end user the benefits are clear, the average quality level increases. This does not necessarily mean that the peak quality level proportionately increases. For that, we may need to achieve that "next big thing."

What does this mean for the future of our industry? We are all just going to have to wait and see together. Competition and the need to create or increase a competitive advantage is a great way to stimulate companies to invest in R&D. The decreasing cost of technology and computer horsepower has made these new tools available to a much larger cast of characters. I am excited to see that "next big thing," wherever it may come from. Of course, I am working every day to be on that winning team!

Reggie Alphin, Board of Directors ALMA International

I'm seeing the industry starting to pick up in terms of growth and quality. We gauge the pulse of the industry through our Winter Symposium & Expo, and we are seeing double-digit growth.



In addition, we are seeing more educators and scholastics joining the association, which will help the industry's future growth.

The loudspeaker industry will be using innovative materials and processes to improve the quality of the products and to provide value to the end user. This innovation pushes the competition to get better, therefore, growing the industry.

Rob Baum, Board of Directors ALMA International

The loudspeaker industry, traditionally defined by two large home speakers for stereo audio only, is not doing so well. That legacy market has faded away. However, if you look at it more broadly, the industry is rapidly evolving. There is growth in audio for home theater and rapid growth in personal audio with headphones and mobile phones, wireless portable speakers, and even OEM





A company called Akemake, with the help of a new 3D printing material from Fillamentum, used a 100% natural wood filament called Timberfill to print out a working desktop speaker. (Photo courtesy Fillamentum.com)

car audio, which has tremendously improved in the last two decades. Inexpensive and powerful digital signal processing and amplifier ICs enables very good performance at relatively low price points.

On the Pro side, we have seen a massive shift over the last 20 years to smaller home studios fueled by computer-based digital audio workstations (DAWs). That means a significant growth in the small powered studio monitor business as well as headphones. Headphones themselves are enabled by smartphones that store or stream music whenever and wherever consumers want to listen in the same way that wireless speakers have achieved remarkable success.

As Yogi Berra said, "It's tough to make predictions, especially about the future." The future should hold increasing growth and segmentation of the personal audio market, such as all sorts of headphones for use outdoors, as fashion accessories, as devices which monitor health. Health is a mega-trend for consumer electronics in general as many Americans start to take responsibility for their own health and confidence in the conventional US health care system continues to erode.

We are seeing the continued proliferation of additional speakers in commercial theaters, and this may come to home theater as well (e.g., Dolby Atmos, which can accommodate up to 128 audio tracks and 64 unique speaker channels).

We will also see further integration of formerly separate pieces of audio systems as powered speakers begin to displace the traditionally passive (non-powered) speaker attached to an amplifier. Speakers in the future will be wired via CAT5 or power lines and wireless nodes on

a home AV network, with built-in amplifiers, signal processing, and microphones to monitor their acoustical environment and assist in setup/diagnostics.

Such change implies that most audio brands will not survive the transition to fully digital and networked audio and video. We have already seen substantial consolidation.

I also believe that we will see a combination of factors: rising labor costs in China driven by rising wages and the appreciation of Chinese currency vs. the US dollar, the growth of a revolutionary technology, 3-D printers, and the desire for mass customization. This will cause a resurgence of domestic manufacturing in the US across many industries in those US states with favorable business policies.

Since the US supply chain for consumer electronics and other industries has been greatly reduced by an exodus to Chinese industrial clusters (e.g., those north of Hong Kong and west of Shanghai), key parts will have to be brought in from China for the foreseeable future. As robots and automation exponentially improve in computational power and flexibility, more and more production can come back to the US, eliminating many hidden costs of offshore production. The counter strategy is for Chinese manufacturers to automate and move up market, which we are already seeing. So the end state may be a mix of both domestic and offshore production, with many high-quality components imported from China for assembly into product builds or domestically printed 3-D. The cost will be the disappearance of many low-skill manufacturing jobs around the world.

Final Thoughts

ALMA International's volunteer Board of Directors encompasses engineering, marketing, consulting, and executive perspectives. While there are some similarities in the observations, there are also some notable differences which may reflect the board members' varying areas of expertise. What is universal is that while there may be challenges to the loudspeaker industry, there is also a great deal of opportunity.

Education, innovation, collaboration, and communication will continue to make the loudspeaker industry a vibrant participant in the consumer and professional electronics industries. ALMA International is pleased to be a vital forum for communication and collaboration among loudspeaker industry professionals. For more information, visit www.almainternational.org. *LIS*

An Industry Update on the Status of Loudspeakers and Headphones

By
Alan Trevena

(Audio Engineering Society,
Chairman of the Technical
Committee on Loudspeakers
and Headphones)



This 40-mm neodymium high-output headphone element contains a neodymium magnet and low-mass mylar diaphragm combined to deliver high sensitivity and extended high-frequency response. (Photo courtesy of Parts Express)

The Audio Engineering Society (AES) Technical Council has been in place since 1979. Its Technical Committee on Loudspeakers and Headphones has existed in its current form for more than 20 years and comprises 75 members worldwide. With their mix of academic and professional backgrounds, members provide expertise in transducer design, modeling, and measurement for applications across the audio industry. These committee members set the standards and help shape the audio field for future generations.

Loudspeakers remain at the heart of almost every audio system and provide the link between technology and the art of music. Essentially, loudspeakers convert an electrical audio signal into a corresponding sound. The first crude loudspeakers were invented during the development of telephone systems in the late 1800s, but electronic amplification via vacuum tubes began around 1912, making loudspeakers practical. By the 1920s, they were used in radios, phonographs, public address systems, and theater sound systems.

In the last decade, the loudspeaker industry has continued to expand exponentially, in part due to the recent growth in headphone sales and the increase in personal devices (e.g., smartphones and tablets). With such devices, there is more focus than ever on small and micro speakers and increasingly innovative designs to produce big sound from tiny devices.

The recent growth in headphones and personal consumer devices has led to increased use of small and micro speakers. This provides unique challenges to the system designer. While overall



Audeze EL-8 headphones are designed by BMWDesignWorks USA and available in open- and closed-back models, wood veneer accents, and features advanced planar magnetic technology. (Photo courtesy of Audeze)



Before the Walkman revolutionized the devices in the 1980s, headphones were big and clunky and stayed mostly at home. Now, headphones are slimmed-down devices built to go anywhere.

product form factor is shrinking, consumer expectation on audio quality (specifically low-frequency extension and loudness) has not changed. The focus on improving low-frequency extension in micro speakers is leading to new approaches (e.g., a “hybrid” diaphragm with complex compliance across the surface).

Factors Affecting the Industry

A major loudspeaker component is the driver and the material used to make the driver. Modern driver magnets are almost always permanent and made of ceramic, ferrite, Alnico, or rare earth materials such as neodymium and samarium cobalt. A trend in design—due to increases in transportation costs and a desire for smaller, lighter devices (as in many home theater multi-speaker installations)—is the use of the rare earth materials instead of heavier ferrite types.

When high field-strength permanent magnets became available, alnico, an alloy of aluminum, nickel, and cobalt became popular. Since it dispensed with the power supply problems of field-coil drivers, alnico was used almost exclusively until about 1980.

After 1980, most driver manufacturers switched from Alnico to ferrite magnets, which are made from a mix of ceramic clay and fine particles of barium or strontium ferrite. The size and type of magnet and details of the magnetic circuit differ, depending on design goals.

Then manufacturers switched to neodymium magnets, which have become the most widely used type of rare-earth magnet, replacing alnico and ferrite magnets in many modern technology applications where strong permanent magnets are required—including loudspeakers and headphones—because their greater strength allows the use of smaller, lighter magnets for a given application.

Following the spike in neodymium and dysprosium prices in 2011/2012, these key materials hit peaks of 800% and 2,200% of their 2008 prices, respectively. While dysprosium remains elevated over its mid-2000’s price, the market appears to have stabilized. This is, in part, as a result of additional mines coming online outside of China, but also the focus given to the China market and export quota process by the World Bank. This intervention gives hope that the cost of these essential materials will remain somewhat more stable. As a result, the trend to redesign neodymium-free drivers has started to subside as a result.

Signal Processing

In general terms, signal processing is an enabling technology that encompasses the fundamental theory, applications, algorithms, and implementations of processing or transferring information found in many different formats. Digital signal processing (DSP) is the processing of digitized discrete-time sampled signals by computers or by digital circuits such as ASICs, field-programmable gate arrays (FPGAs) or specialized DSP chips. Improvements, and the growing prevalence of DSP, in consumer audio systems means the relationship between the driver and the system is changing. Excursion at low frequencies and performance at high output levels are digitally managed. Frequency response irregularities are smoothed with ease using simple DSP tools. Almost all consumer products now include built-in digital signal processing to optimize the acoustic system.

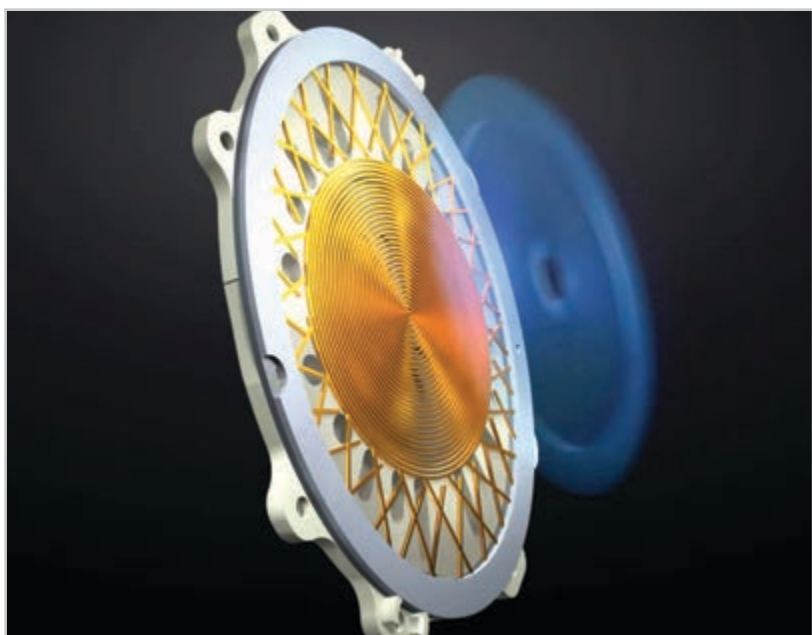
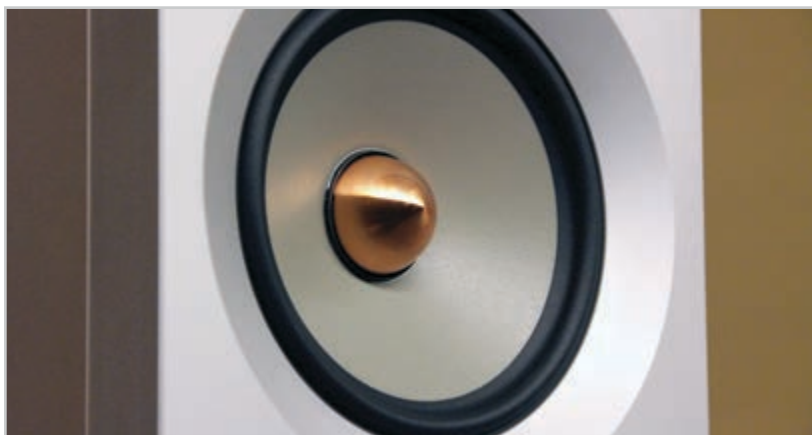
To Stay Informed

Numerous papers on loudspeakers and headphones appear in the *Journal of the Audio Engineering Society (JAES)* and are presented at AES conventions each year. There have been several dedicated conferences on both loudspeakers and headphones.

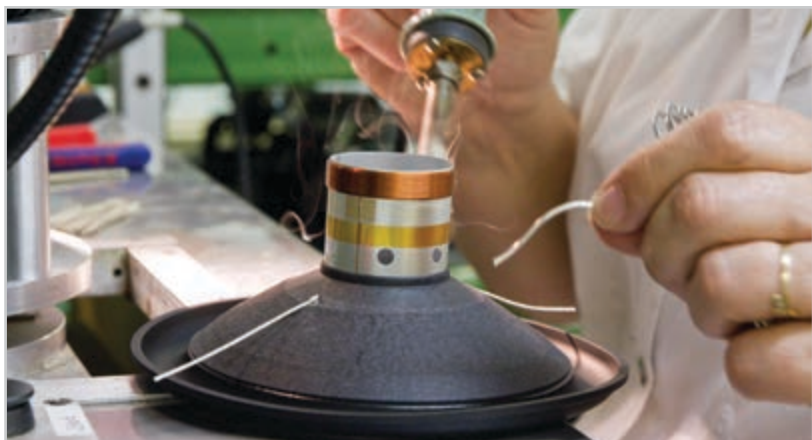
The next one, "Headphone Technologies," is being planned for fall 2016, to be held in Denmark. The conference targets scientists, developers, and practitioners involved in headphone technologies independent from having their personal focus in materials, electro acoustics, signal processing, or perceptual evaluation. Moreover, the conference will put a special emphasis on the emerging fields of mobile spatial audio and augmented reality (i.e., applications and solutions for headphones with sensors). For more information, visit www.aes.org. *LIS*

About the Author

Alan Trevena has been an active member of the Audio Engineering Society (AES) for more than 10 years and he has been chairman of the Loudspeaker and Headphone Technical Committee for the past three years. He also served as chairman of the 36th International AES Conference on automotive audio in 2009 and he was on the committee of the 48th International conference on the same topic. A graduate from Salford in the UK, Alan is currently working in Taipei as Technical Program Lead for Tympany, where he develops consumer audio systems for a global customer base.



The OPPO Digital planar magnetic driver generates sound by a thin, light diaphragm whose entire surface area is evenly driven. (Photo courtesy of OPPO Digital)



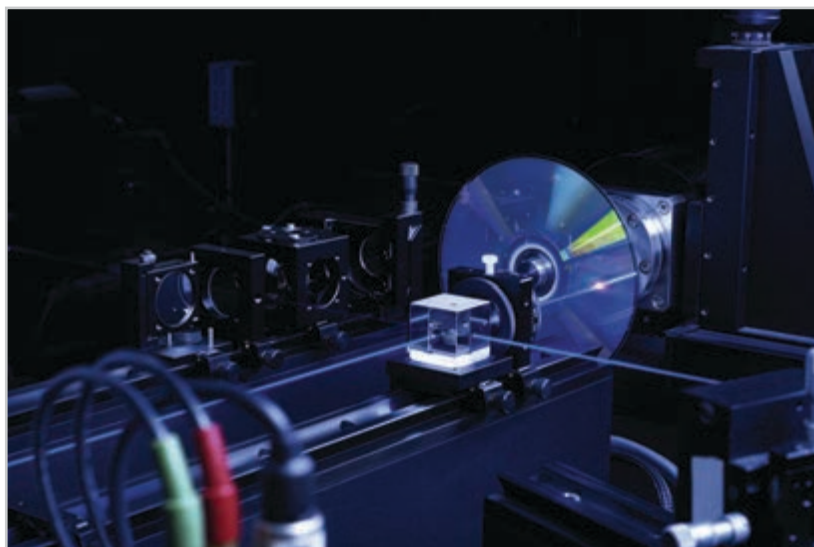
Are We Nearly There Yet?

By
Jack Wetherill
(Futuresource Consulting)

The way people acquire and listen to music has dramatically changed in recent years. Several products and supporting technologies have emerged that promise the “Holy Grail” of seamless audio experiences in the home, irrespective of what room you’re in or your listening source. But how close are we to that perfect match of quality and convenience at an affordable price?



More than a decade after the arrival of the first iPod, the transition from CD to digital music is still far from complete. An estimated \$18 billion was globally spent on music last year, of which 56% was spent on packaged music (mainly CDs), with the remainder spent on downloads and music subscriptions.



Many consumers still prefer to buy CDs. An estimated \$18 billion was globally spent on music last year, of which 56% was on packaged music, mainly CDs. (Photo courtesy of Bayer Material Science, www.bayermaterialsciencenafta.com)

While this is substantially ahead of the 15% share of spending that was claimed by digital in 2008, Futuresource believes that—even by 2018—25% of the money spent on music will still be on the physical, packaged product. Many consumers still prefer to buy CDs.

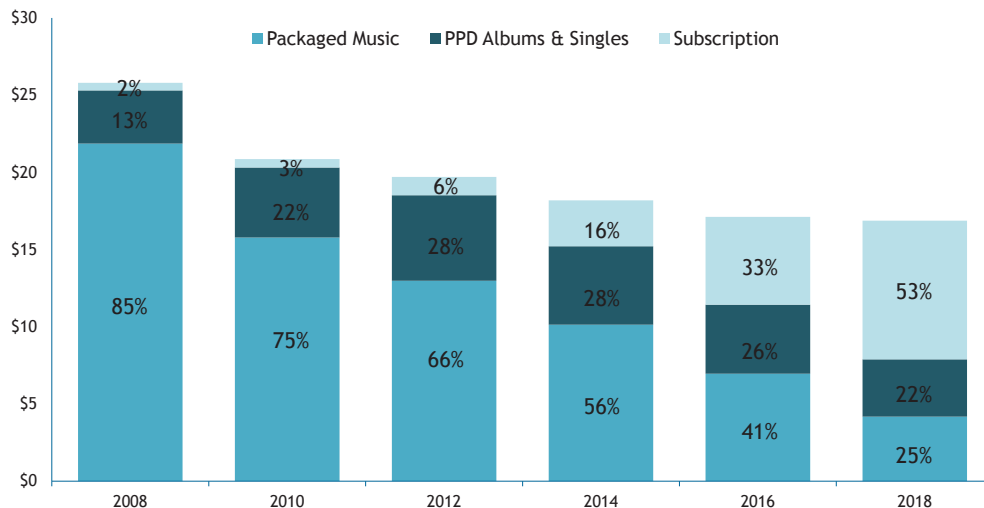
Futuresource consumer research in 2014 found that 49% of respondents in the US and Western Europe still buy CDs. Of these CD buyers, 12% were also buying pay-per-download (PPD) tracks and listening to music streaming services. This highlights the fact that many consumers are still in transition, although the numbers vary quite considerably by country. The Japanese still have the desire to possess the physical disc, with just an estimated 22% spent last year on digital. Meanwhile, Sweden is an extraordinary example of how streaming subscriptions can revitalize a market, with Spotify effectively turning the market on its head in just under four years. Nearly 90% of Swedish consumers purchase digital music.

Services such as Spotify, Deezer, and Pandora are important factors in the growth of music streaming. They are eroding the traditional model of consumer music ownership, instead encouraging people to share music from the cloud. This has an enormous influence on what equipment consumers buy and use. Devices that are unable to wirelessly communicate are rapidly

MUSIC MARKET OUTLOOK: GLOBAL

Digital Share of Spend is Growing: 44% in 2014

Consumer Spend (\$ Billion)



Note: Does not include streaming radio services such as Pandora, or Sirius XM (total spend on Sirius XM subscriptions was \$3.28 billion in 2013). Also excludes ancillary and advertising revenues

Source: Music Market and Streaming Services Overview, Futuresource Consulting Aug 2014

1 | © 2014 Futuresource Consulting Ltd



When it comes to the global music market outlook, the digital spending share is growing: 44% in 2014.

becoming redundant. However, this brings with it the risk of loss of audio playback quality.

Smartphones for Music Playback

The smartphone is now the most commonly used device for music playback. Ownership numbers are already huge, but there is much more growth to come. About 85% of US consumers own a smartphone. At the end of 2014, there were 2.5 billion smartphone owners globally; that's nine times more than the number of iPods in use at their height in 2009.

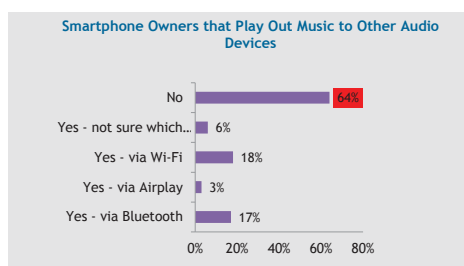
People primarily buy smartphones to use them as phones, but how many also use them to listen to music? US and Western European respondents to the Futuresource's "Living with Digital" consumer survey told us that 54% of smartphone owners use their devices for music listening. We also asked these people if they play the music out to other speakers. And the answer was that 64% do not—so they are listening only by means of headphones or the phone's internal speaker.

The fact that 36% are liberating their music by playing it through wireless speakers, hi-fi systems, and so forth is great, but it also illustrates how much of an opportunity there is to sell wireless audio products. Similar dynamics apply with tablets. In the US and Western Europe, there are 261 million tablet owners—41% of them are listening to music on the device, but 59% do not

play it to other external speakers.

This is why the wireless speaker market is developing at such a tremendous speed. Futuresource estimates the market grew by 117% in 2014 to 29.7 million units (generating trade revenues of \$3.4 billion) worldwide. As expected, the US leads the way, accounting for nearly half of worldwide sales. But, this is an international phenomenon and will penetrate markets never really reached by iPod docks. (Docks incidentally have suffered an extraordinary decline in the past two years. Since the switch to Lightning connectors many consumers and brands are

64% of those who play out music from their Smartphone still do not use an external speaker



Source: Futuresource Living With Digital Wave 9, December 2014

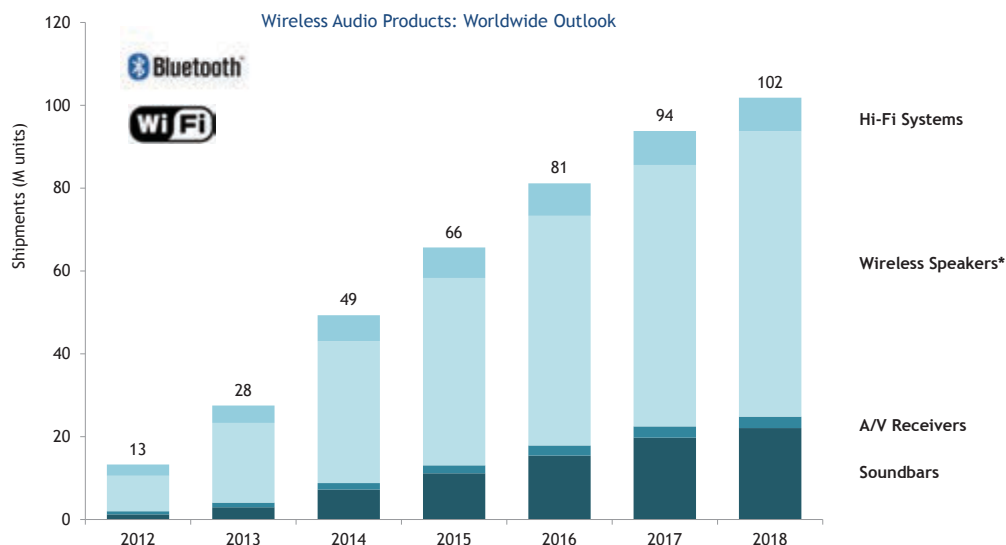
Base: 3,110 respondents in USA, UK, Germany & France

A reported 64% of those who play out music from their smartphones still do not use an external speaker.

The worldwide wireless home audio outlook shows that audio products with wireless features are in great demand.

WORLDWIDE WIRELESS HOME AUDIO OUTLOOK

Audio Products with Wireless Features are in Great Demand



Source: Worldwide Home Audio Market Report, Futuresource Consulting, Dec 2014

3 | © 2014 Futuresource Consulting Ltd

futuresource
CONSULTING

considering wireless technologies in a more favorable light.)

Audio Hardware

It was evident from the 2015 International Consumer Electronics Show (CES) that audio hardware has regained its cool status—it's not just headphones that have street credibility. Cool design, allied to innovative technology can generate a lot of excitement and wireless

speakers were in the spotlight. The real strategic battleground has become multiroom audio. Sonos has pioneered this market for more than a decade and numerous brands including Bose, Samsung, Panasonic, and LG have launched their own rival products to get a piece of the action. New products are typically two to three variants of the same speaker in different sizes and at different price points, all competitively priced to Sonos.

Wireless multiroom audio speakers currently retail at an average price of \$300 and prices are expected to only marginally decline over the next two years. Global shipments of wireless multiroom audio speakers in 2014 were forecast to grow by 112% to reach 4.2 million units, with Sonos still commanding around two-thirds of the market. However, there is some concern that consumers are becoming confused by the plethora of new product releases. Several devices run on proprietary technology, meaning they cannot be used with other brands. Even those that run on open standards cannot be relied upon to interoperate as there are several open systems on the market—most notably Play-Fi, Caskeid, and AllPlay. Many potential consumers could find themselves paralyzed by this bewildering array of choices. While demand for multiroom products will undoubtedly grow significantly, Futuresource believes that simpler Bluetooth products without multiroom functionality will still command 60% of global wireless speaker sales by 2018.



Respondents to the Futuresource "Living with Digital" consumer survey in the US and Western Europe told us that 54% of smartphone owners use their devices for music listening. (Photo courtesy of Russound)



Futuresource estimates the wireless speaker market grew by 117% in 2014. (Photo courtesy of Bang & Olufsen)



High-resolution audio (HRA) is being strongly promoted by companies such as Sony in all industry trade shows. (Photo from audioXpress)

Music Streaming

Streaming no longer necessarily implies a reduction in audio quality. One of the big themes of 2015 will be the progress of high-resolution audio (HRA). Several streaming services are offering high-resolution options and some brands of Wireless Speaker are designing compatible products. Bose Soundtouch, Panasonic All series, LG Music Flow, Harman Omni, and Phorus all support high-resolution formats.

The availability of high-resolution music content and hardware will grow as the audio industry seeks to promote a premium audio experience to complement the convenience of digital audio. However, a few obstacles still must be overcome before high resolution becomes mainstream. Some of the obstacles include:

- Low consumer awareness of the benefits of high resolution and how to achieve the experience with hardware components, wireless/wired media, and content
- Limited availability of HRA content
- High prices for content and hardware



While a growing share of music consumption is streamed, the ability to accommodate high-resolution audio (HRA) files over Wi-Fi without latency and loss in audio remains a challenge over existing networks. (Photo courtesy of Arcam, www.arcam.co.uk)

- Lack of bandwidth to stream high-resolution content (While a growing share of music consumption is streamed, the ability to accommodate HRA files over Wi-Fi without latency and loss in audio remains a challenge over existing networks.)

The extent to which these issues are tackled will have a major effect on the uptake of high resolution. It does offer the prospect of recovering some of the ground lost in the rush to purchase MP3s, but it will be interesting to see how many consumers decide that the current quality, price, and comparative convenience of lower resolution files is sufficient.

Television Audio Quality and Soundbars

One area that is benefiting from improving audio quality is television. Soundbars are being snapped up by consumers, eager to improve the sound of their flat-panel TVs without the inconvenience and clutter of wiring multiple speakers. While they were originally positioned as TV accessories, soundbars are also increasingly finding a role as the main speaker, thanks to their ability to stream from phones via Bluetooth. Multiroom audio brands also generally deploy a soundbar as part of their armory.



Soundbar speakers remained very popular in 2014 at the expense of the sales of Home-Theater-in-a-Box (HTiB) systems, which have plummeted. (Photo courtesy of Sony)



Klipsch demonstrated its Reference Premiere Wireless Home Theater speakers with support for the Wireless Speaker and Audio (WiSA) Association technology at the 2015 International Consumer Electronics Show (CES) in January.

While the global soundbar market grew by half in 2014, it has come at a cost. Sales of Home-Theater-in-a-Box (HTiB) have plummeted. The decline is partly because of their relative complexity to set up, but also because people have fewer requirements to play back from DVDs/Blu-ray discs than in the past. It could be argued that HTiB in many cases are a higher quality audio device, not reliant on streaming and with true surround sound thanks to the multiple speakers, but consumers are rapidly migrating to soundbars.

The other home cinema option is component systems with an AV receiver. Global demand last year was down only slightly at 3.4 million units and this relatively high-end option has been stubbornly resilient over the years in the face of competition from cheaper, simpler alternatives. Brands continue to innovate, with 3-D sound an increasingly interesting feature thanks to Dolby Atmos and the forthcoming DTS-X.

For high-end multi-speaker installations, the arrival of products compliant with Wireless Speaker & Audio (WiSA) Association standards will be a real enabler. Klipsch demonstrated WiSA speakers at the 2015 CES in January, at

a price that was much more affordable than other products launched to date. Futuresource believes that products based on WiSA wireless technology will help renew interest in the high-end loudspeaker market.

Several New Choices

So, there are many reasons for consumers to invest in new audio devices. For those who want to merely improve the sound of their flat panel TVs, enjoy their digital music on decent speakers around the home, or take music listening to the next level with 3-D and HRA, the options are available and becoming more affordable.

Whether or not consumers successfully integrate these products into their homes for a seamless experience is less certain. Wireless connectivity promises a lot but still does not always deliver reliability and quality without a lot of effort on the consumer's part. But this is a work in progress. Consumers have been used to juggling different formats over the years (e.g., vinyl, tapes, minidiscs, and CDs) and technological developments will likely mean that consumers will always be adapting their equipment and listening habits. Overall, this type of innovation is generally good news for the industry as it means more sales! *LIS*

About Futuresource Consulting

Futuresource Consulting delivers specialist research and consulting services, providing knowledge, experience and accuracy to support decision-making processes. Since the 1980s, it has supported a range of industry sectors, including Consumer Electronics and Pro Audio Equipment. Reports are issued regularly that quantify and forecast the market for devices including wireless speakers, soundbars, hi-fi systems, AV receivers, and loudspeakers. With 60 full-time employees delivering in-depth analysis and forecasts across the entire value chain, it advises on market, competitive and technological developments, providing access to the information that helps its users produce the best possible results. For more information, visit www.futuresource-consulting.com.

About the Author

Jack Wetherill is Senior Market Analyst in consumer electronics. With more than 12 years of research and consulting experience, Jack leads Futuresource Consulting's Home Consumer Electronics team. Jack joined Futuresource in 1999 after several years working in Library and Information Management. During his time at Futuresource, Jack has been closely involved in the tracking and forecasting of the global market for home AV products. He currently drives Futuresource Consulting's continuous reporting into TV, home audio, and home video hardware, with a particular focus on the impact of the transition to digital delivery and online content.



Polk Audio Omni S2 is enabled with DTS Play-Fi technology, an open platform that can control your entire home audio system. (Photo courtesy of Polk Audio)

The "Must Have" reference for
loudspeaker engineering professionals.

Home, Car, or Home Theater!

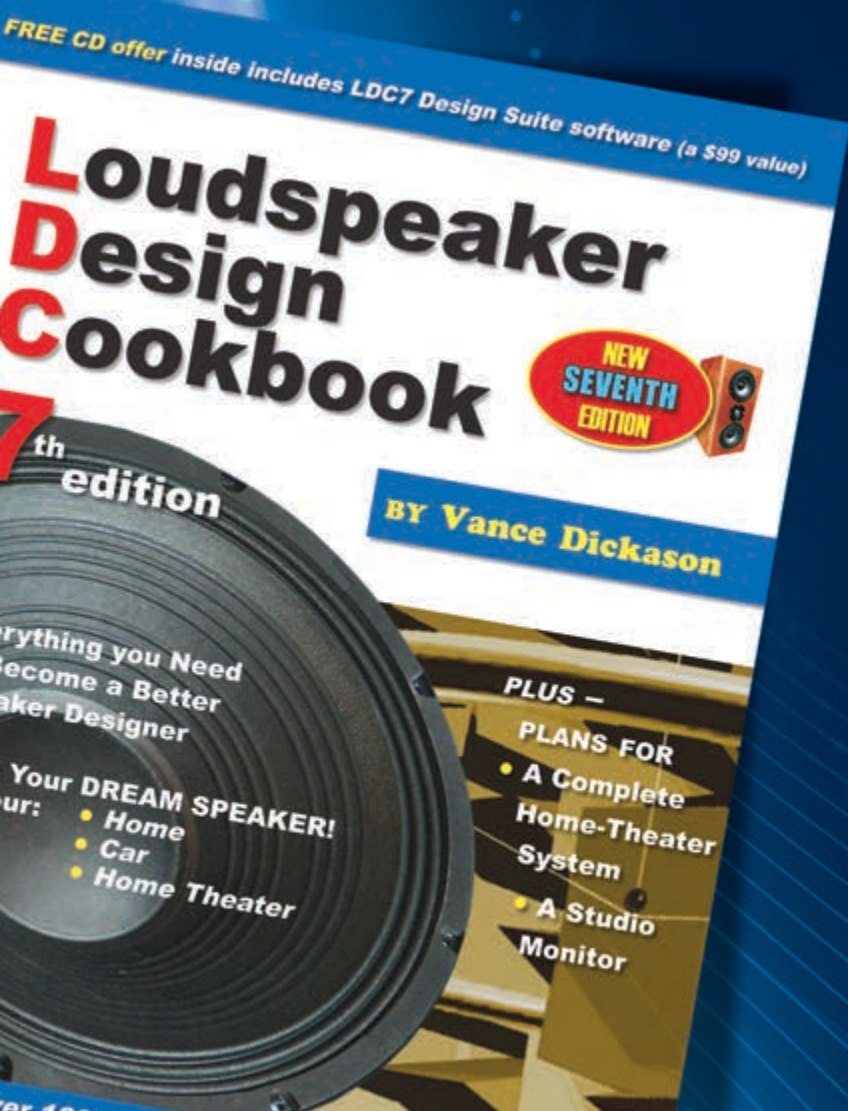
Back and better than ever, this 7th edition provides everything you need to become a better speaker designer. If you still have a 3rd, 4th, 5th or even the 6th edition of the *Loudspeaker Design Cookbook*, you are missing out on a tremendous amount of new and important information!

Now including: Klippel analysis of drivers, a chapter on loudspeaker voicing, advice on testing and crossover changes, and so much more! Ships complete with bonus CD containing over 100 additional figures and a full set of loudspeaker design tools.

A \$99 value!

Yours today for just \$39.95.

Shop for this book, and many other audio products, at
www.cc-webshop.com.



25 Years of aptX

By
Jon McClintock

(Director of aptX Sales
and Marketing, CSR)



The original aptX
codec logo



The current aptX logo

The aptX audio codec has revolutionized the Bluetooth stereo listening experience, bringing high-quality wireless connectivity to consumer electronics applications, including Bluetooth stereo headphones, speakers, and soundbars. aptX has been adopted by leading consumer electronics brands such as Apple, Creative Labs, HTC, LG, Microsoft, Monster, Motorola,

Panasonic, Samsung, Senneheiser, and Sony, which means there are many millions of smartphones, tablets, laptops, headphones, and soundbars that deliver high-fidelity wireless audio using aptX.

The Origins of aptX

The aptX audio coding algorithm originated as the result of doctorate research undertaken at Queen's University Belfast in the late 1980s. This innovative work was focused on bit-rate reduction for wide band stereo audio. CD audio requires 1.411 Mbit/s of data to transfer music sampled at 44.1 kHz F_s —the use of aptX reduced this bit rate to 354 kbit/s. Thanks to these significant bit-rate efficiencies, aptX was also able to preserve audio quality and perform the mathematical process in an incredibly quick time—under 2 ms. These simultaneous features were unknown at the time, and still 25 years later, no other wide band audio coding technique can deliver this “Holy Grail” of bit-rate reduction.

However, it was a relationship with Steven Spielberg and DTS that launched aptX as a major player. DTS, the company behind the surround-sound formats used in cinemas, chose aptX for its digital cinema playback codec. This meant that aptX powered the 5.1 low-frequency effects (LFE) that made the thunderous boom of the tyrannosaurus rex in *Jurassic*



Bowers & Wilkins' T7 Bluetooth aptX speaker directly streams audio from any Bluetooth-enabled PC, tablet, or mobile phone without the need for a Wi-Fi network.

Park possible in cinemas.

The fact that Hollywood royalty believed in aptX so much (George Lucas and the Skywalker Ranch were also adopters) provided major kudos for the brand and spawned a new focus in the film and music industry. Around the same time, telecommunications companies were providing Integrated Services for Digital Network (ISDN) services (e.g., digital dial up phone lines). Bundling aptX with ISDN lines enabled the film industry to standardize mix approvals, voice overs, automated dialogue replacement (ADR), and foreign language overdubs on aptX.

The broadcast industry also became increasingly reliant on aptX for multiple applications. If you've ever listened to the radio or been to the movies then chances are you'll have heard aptX in action. More than 30,000 radio stations across the world and thousands of cutting-edge film studios rely on the aptX codec for high-quality audio delivery.

aptX Takes Over

This takes aptX into the new millennium. Around this time, Bluetooth stereo gained the unfortunate reputation for providing only average audio quality. Higher-end audio companies stayed away from Bluetooth stereo because they didn't want to ruin their standing among audiophiles. But a lot has changed since then—new codecs have emerged that enable users to wirelessly benefit from CD-like quality audio, with aptX foremost among them.

The same principles that made aptX so suited to broadcast applications made it ideal for Bluetooth stereo audio delivery. In 2009, the aptX audio codec first brought high-quality audio to wireless consumer electronics applications.

Since that time, aptX has gone from strength to strength. It is commonly seen as the catalyst for igniting the burgeoning wireless speaker and headphone market. More than 400 million smartphones and tablets are aptX enabled, and the codec provides great quality audio from approximately 40 million Bluetooth headsets, speakers, and soundbars. The brand's recent growth is largely due to the widening of supported platforms including Android, Windows Mobile, Mac OS, and BBM.

In the past year alone, aptX has seen a myriad of high-profile aptX-enabled product launches from Bang & Olufsen, Bowers & Wilkins, and Plantronics, establishing aptX as a strong and recognized brand.

What's Next for aptX?

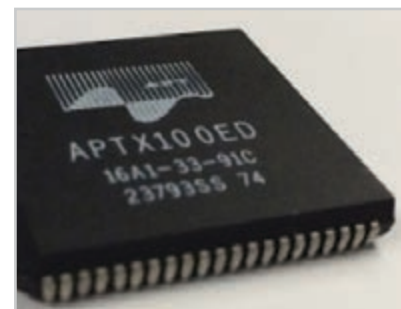
The built-in CD player is being replaced by a smartphone or a tablet as the primary source



JVCケンウッド has chosen CSR's aptX codec for use in its in-vehicle infotainment systems. Consumers are increasingly using their mobile devices to bring their favorite audio content into the vehicle and they expect to be able to stream it to the head unit without compromising on audio quality. The move to use aptX in automotive infotainment products represents the further growth of the codec's ecosystem and its proliferation into new markets. And because millions of smartphones—including most Android handsets as well as the Sony Xperia Z3 pictured above—support aptX, OEMs don't have to worry that consumers won't have compatible devices.

for car audio. Some of the world's leading makers of car infotainment systems, like JVCケンウッド and Alps Electric, have chosen to integrate the aptX codec into their products. It's only a matter of time before car manufacturers directly build aptX into cars as standard and drivers will be able to stream pure wireless audio over Bluetooth to their car speakers with no loss in sound quality.

We're also moving beyond music to bring consumers brilliant gaming and film experiences with aptX Low Latency. The aptX codec's latest iteration reduces the latency (delay) over Bluetooth even further, making it ideal for gaming and video applications that require action-synchronized sound. With a latency of just 40 ms—lower than any other audio codec—aptX Low Latency opens the door to uncompromised gaming and video experiences over Bluetooth. *LIS*



The aptX100ED IC with aptX

aptX in Numbers

- More than 400 million source devices
- Powers approximately 40 million Bluetooth headsets and speakers
- Approximately 300 licensees
- More than 20,000 DTS cinemas
- Brings wireless sound quality to 30,000 (of 44,000) radio stations worldwide

About the Author

Jon McClintock is the Director of aptX Sales and Marketing at CSR. He has a graduate degree in Electronics from the University of Ulster and more than 25 years of experience in the audio industry. He was Director of Sales and Marketing for Audio Processing Technology for APT Licensing, Ltd. before it was acquired by CSR in July 2010.

Morel Celebrates 40 Years



Meir Mordechai is pictured with his son Oren, who now manages the factory. (Photo courtesy of Morel)

This year, Morel plans to celebrate 40 years in business, an achievement that is worth recognition in the ever-evolving audio industry. Morel is also the cover sponsor for the 2015 *Loudspeaker Industry Sourcebook*.

By
**Mike Klasco and
Shannon Becker**

Meir Mordechai, Morel's founder, recently had some time to reflect on the past 40 years. He said looking back at four decades of growth and development cannot be summarized in a few sentences. "It has been a life-long journey for me to turn a hobby into a thriving and successful business. The world as we know it was very different 40 years ago—the challenges were different, communication was much harder, the market was less saturated with products/suppliers, and people had simpler needs."

At the same time, Mordechai said, "I am proud of what we accomplished and the manner in which we did it. Despite the great challenges we faced throughout the years, we strived to develop and engineer new technologies and products that would push performance standard to new levels, and still maintain core technologies and identity. We always maintained the importance of quality craftsmanship, innovative design, and high performance—those have been our core values from the day I established the company."

Morel's Beginnings

The impetus for Morel began 3,000 miles to the north of its current location when Mordechai entered into a business relationship with Ejvind Skaaning,—a man who seems to be a common element among most Danish speaker companies, in addition to Morel.

According to bits and pieces from noted speaker engineer Claus Futtrup's online blog, "Mr. Ejvind Skaaning was born on April 17 1929, in the small town of Vejen, Denmark. Recording, audio, and speakers were hobbies but by the mid 1960s, Mr. Skaaning focused on starting his loudspeaker business. In 1968, Skaaning was the subcontractor to Scandyna for the famous Dynaco A-25 speakers using SEAS drivers. Soon after in 1970, Scanspeak was founded and Skaaning was in charge of operations and transducer development."

In 1974, Mordechai entered into a joint venture with partners Ejvind Skaaning and Gerhard Richter to form RMS (which stood for Richter, Mordechai, and Skanning). Based in Israel, the partners wanted

to develop next-generation concepts in drive unit construction. In 1979, RMS started manufacturing raw drivers (at what is now Morel's plant) in Ness-Ziona, which is a suburb of Tel Aviv, Israel. The company, which became Morel, still resides at the original site. A freeway, now in its final construction stages, will soon be adjacent to the factory.

Following the RMS partnership, the Middle East became progressively unstable and the future seemed bleak especially in Lebanon where Skaaning had heavily invested. With the civil war in Lebanon and Skaaning's other Lebanese investments at risk, he was ready to cash out and go home. Mordechai, an Israeli, bought Skaaning's (and Richter's) shares after two years in business.

Mordechai called the former Danish-style speaker company, Morel. After the split, relations were good among the former partners. Initially, Dynaudio even supplied some components for a couple of Morel's loudspeaker models.

Mordechai admits there were great challenges throughout the years. "While establishing Morel in Israel in the early 1970s, many aspects of doing business that we now take for granted were an extreme struggle for us. The importation laws were draconian and levied with very high tariffs on raw materials. The logistics out of Israel was also not easy and required creative ways of thinking. Even communication was difficult as telephone lines were not widely used at that time in Israel."

In 1982, Morel invented the renowned double magnet system for its high-power 3" diameter range of drivers. In the mid 1980s, Morel briefly opened an additional factory in the UK. Mordechai did this to deal with the trade laws and practices of the European Community (EC), which hindered any export into Europe. In the mid 1990s, Israel became a member of the EC trade agreements, the trade laws were changed, and the Israeli and the UK facilities were unified into the one manufacturing facility in Israel.

Today, Mordechai said, the challenges are completely different. The advanced technology platforms and high level of communication have created a market that is very dynamic, fast-paced, and ever changing.

"It has transformed the needs of people—everyone wants new products immediately, and these products must be highly functional while incorporating many elements of design, quality, and performance. The challenge for many companies in our market segment is to keep up with a drastically shorter product life cycles and highly functional product orientation in light of depreciation of raw material quality, very high production costs,

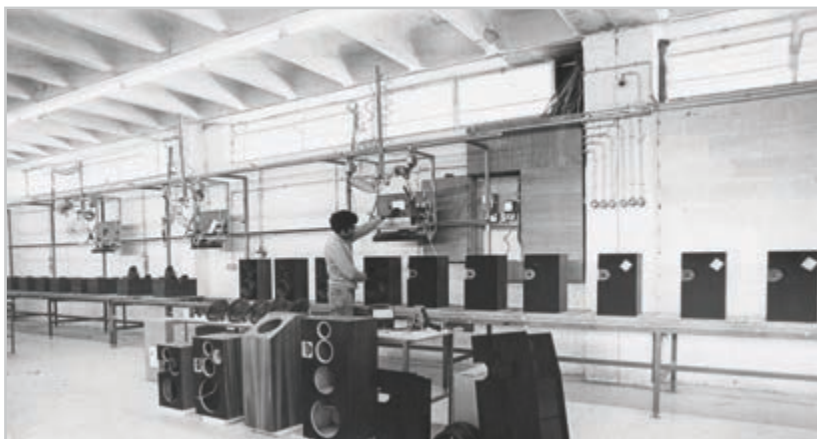


Meir Mordechai continues to oversee the company that he started almost 40 years ago. (Photo courtesy of Morel)

and constantly changing technology platforms," Mordechai explained.

And yet, almost 40 years later, Meir Mordechai still watches over Morel. His son Oren (now 40) manages the factory. Nir Paz manages the company's global sales and the US operation. Morel remains successful partially because the company has continued its legacy of innovation with a range of products that incorporate small but powerful and creative motor systems inside a rather large voice coil for a given speaker size.

Internationally, Morel is best known for some very over-the-top drivers in the aftermarket car industry. Its Ultimo Titanium 10" subwoofer has won the prestigious European Imaging and Sound Association (EISA) 2014-2015 Best Product award. Morel's Fat Lady tower speakers are favored by



This photo, taken in 1978, shows Morel speaker cabinets moving down the factory's assembly line. (Photo courtesy of Morel)



Morel's production floor workers are shown in this photo from 1980. (Photo courtesy of Morel)

audio aficionados. Morel's OEM driver strengths are that they are made-in Israel with the technology, service, and communication that come with it. The drivers are also aggressively priced, which make them unprecedented when compared to similar-grade drivers from Europe. As for communications, almost all Israelis are fluent in English.

Morel's work-cell approach to fabrication lends itself to customization on all drivers, even with small batch runs. And, the company can provide OEMs

and ODMs complete turnkey solutions for drivers, integrated electronics, and enclosures. OEM and ODM customers that use Morel's drivers include MACROM, Xtant, DLS, Phoenix Gold, Eggelestone Works, Rega, Ruark, Quested, HHB, Leon Speakers, CAT, CAV, NIRO Nakamichi, and others. Morel also has a long-established sales and warehouse facility in New York.

The Factory

Morel is a boutique operation with more than 40 employees. Separate engineering areas, the acoustics lab, and the production floor are well organized and operate to a high standard. Special speaker construction and quality techniques are used throughout the production facility.

Morel makes most of its parts, using in-house voice coil winding. The company also locally sources items (e.g., the deep-drawn copper caps that attach to the pole pieces to null eddy currents and linearize phase response and the unique one-piece carbon fiber cones) from other high-tech companies.

Morel's "DNA"

Loudspeakers have a signature sound as well as a signature construction. The European approach to ultra-low distortion linearity is evident in the design and construction of Morel speakers.

Morel's motto is "Sound that captures musical magic." Morel translates that existential thought into tangible technological developments and precise time-domain performance, optimizing frequency response and reducing distortion while remaining linear at large signal levels. Time-domain performance comprises impulse response rise time and settling time, as well as phase/group delay linearity and latency.

The fidelity and integrity of what goes into building the loudspeakers impact the outcome. Morel's high standards guide the selection and design of new materials and geometries for cones, tweeter diaphragms, magnetic circuits, and everything in between. The unique design techniques found in the Ultimate subwoofer, the Titanium former woofers, and the Elite and Supreme series differentiate Morel's speakers from commodity speakers in several ways.

Morel loudspeakers offer superior linear phase/group delay characteristics. These characteristics are achieved through eddy current canceling topology that reduces inductive rise and lowers total harmonic distortion (THD) and intermodulation distortion (IMD). Copper caps (some with extended skirts deep into the gap) null eddy current modulation and IMD even at higher voice coil excursions.

Linear excursion Thiele-Small (T-S) parameters



A worker glues spider coils at the Morel factory. (Photo courtesy of Morel)

are stable due to the voice coil position. “Overmotored” designs deliver superior electrodynamic damping, achieved through high BL in the motor using strong unique magnetic-structure topology and large-diameter voice coils (e.g., a 3” diameter voice coil in a 6.5” speaker and a 5” diameter voice coil in a 10” woofer).

The open-cast aluminum chassis with below spider venting is anechoic (no reflection from the frame of the backwave comes back through the diaphragm) and it offers increased heat damping for reduced power compression. Also, Morel developed its own composite cone assemblies that combine art and science to suppress diaphragm (cone) breakup and minimize standing waves and reflections, using simulations, treatments, secondary operations, and esoteric materials.

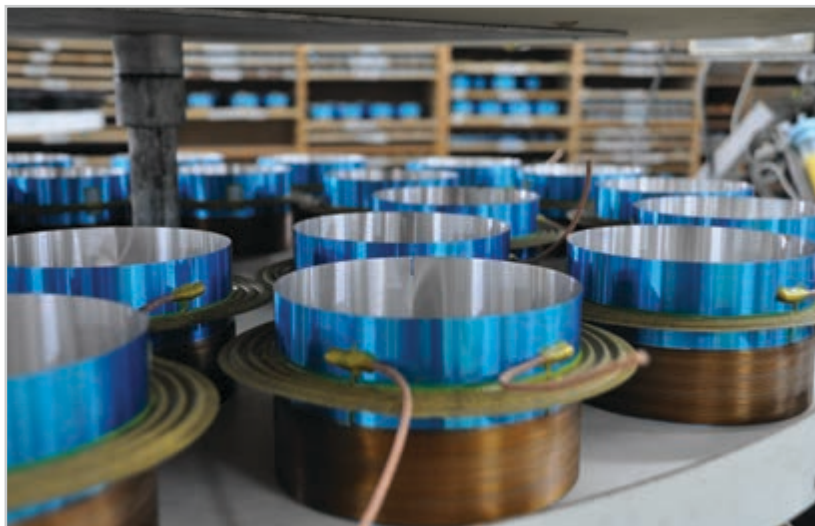
The proliferation of flat-screen displays and TVs has started an OEM race to create a matching thin-depth home theater audio system. Many OEMs have traded true-quality hi-fi sound performance for size. The fact is that big deep speakers are a prerequisite for a high-performance sound system, especially as we approach the low end. Morel raised to the challenge with a new Slim woofer line that will appeal to OEM manufacturers seeking a slim design with quality hi-fi sound performance.

Morel’s Future

Looking ahead, Mordechai said, “First and foremost, my son, Oren Mordechai, is taking a leading role in shaping Morel’s vision in product design and strategy. While I still maintain an active role on the production floor, Oren is paving the road for Morel’s future success with the best team of employees we’ve ever had. It is a profound pleasure to see my son taking the reins with so much passion and drive.”

Mordechai added that the landscape of the speaker market segment has radically changed and evolved in recent years. Integration is the new fashion—integration of speakers/drive units, and integration of brands and companies (mergers).

Product philosophy has become integrative led by functional attributes and not by the product’s performance. This requires minimizing and flattening of high-quality drive units and fitting them into various places—including high-quality headphones, walls, mobile phone speakers, gardens and pools, and car stereos. Utility products also require drive units (e.g., silencing systems and public address). “We are currently working in various segments to develop products that can address market needs with an emphasis on performance quality, and ease of installation and use,” said Mordechai.



Voice coils are wound at the Morel factory. (Photo courtesy of Morel)

Morel is a unique company serving the aftermarket automotive, hi-fi consumer audio, and raw drivers for OEM and DIY segments. “Aside from our own extensive R&D, we are always searching for new opportunities to create synergies with other companies that specialize in their field and share the passion to create innovative and quality products,” said Mordechai.

He added that, “I believe our advance transducer technologies and manufacturing capabilities will continue to be the foundation upon which we will build our future. We have come a long way since the 1970s in material composition, manufacturing process, testing, and speaker simulation.”

“We are continually developing drive-unit technologies to ensure that we manufacture products that meet market demands and perform to the highest possible standards. Our new Titanium based voice coils (range from 2” to 5.1”) is a prime example of what we have recently developed. Another example is our new ultra slim 6—a 6” midbass driver that is less than 1” deep—that will be used in a multitude of applications where miniaturized speakers and high performance quality are required,” he added.

“Regardless of the direction the market will shift, our core values that are the stepping stones which will continue to be the driving force for any future development of our company,” concluded Mordechai. *LIS*

Editor’s Note: This article includes content from a Mike Klasco article, “Nordic Audio Tales (Part 4): Morel—Nordic Influence Thrives in Israel,” that ran in audioXpress in December 2014.

About the Authors

Mike Klasco is the president of Menlo Scientific, a consulting firm for the loudspeaker industry, located in Richmond, CA. He is the organizer of the Loudspeaker University seminars for speaker engineers. Mike specializes in materials and fabrication techniques to enhance speaker performance.

Shannon Becker is the associate editor for *The Loudspeaker Industry Sourcebook*, *audioXpress*, and *Voice Coil* magazines.

Creating The Loudspeaker Sourcing Show

An Interview with Philip Richardson



THE
LOUDSPEAKER
SOURCING SHOW

Loudspeaker Industry Sourcebook (LIS): Tell us a little about yourself.

Philip Richardson: I started my acoustics career working for Nakamichi in Germany in 1986 as a journeyman in production before moving into management. In 1998, I joined GGEC as the Director of OEM Business and was assigned to GGEC in China. While there, I was responsible for engaging Onkyo America as an automotive partner. I then became a shareholder in GGEC.

In 2002, I moved to Panyu and became a shareholder in Guosheng, also serving as the Director of OEM Business for five years. I separated from Guosheng in 2008 and built my own factory called Trueanalog Strictly OEM on the Zeng Ben campus in 2009. Trueanalog Strictly OEM is a tier one manufacturer of finished speaker systems for many of the world's top brands. Zeng Ben Industrial is a first-tier manufacturer of T-yokes, top plates, and U-yokes for many of the world's top loudspeaker

driver name brands. I am also married to Mandy Tseng of Zeng Ben Industrial.

LIS: What is the state of the current loudspeaker industry in regard to product development, business development, and sourcing in China?

Philip: From my viewpoint, the state of the loudspeaker industry is healthy, segmented, disheveled, and for some, focused, organized, and profitable at the same time. The winners are the loudspeaker system brand names that have lean and talented engineers working with marketing managers who are setting the pulse of the market.

I see it in the number of drivers I manufacture and I see it through the output of the component manufacturers making the parts. Recently, I was at a premier aluminum parts supplier and noticed literally two tons of 80-mm OD aluminum round bar stock being off loaded for immediate machining.

I asked the owner “so fast ?” He said, “yes, the customer placed the PO [purchase order] just before the Chinese New Year and they have doubled their business with me in the past 90 days because the project is so popular. We have another shipment for the same customer in 10 days.”

I then thanked the supplier for not putting my project on the back burner. Then, I visited my plastics guy and noticed tools being loaded on the truck and asked why.

He said, “this customer is always stopping, hurrying up, changing—it’s a pain for me, sending tools back.” There are always two sides to the coin, but overall, factories are hungry for business that makes sense.

If a brand is in tune with what the market wants and anticipates the demand, you have a pretty good recipe. At the same time, I work with companies who are too conservative with no innovation and the numbers show it.

LIS: How did you conceive of the idea for The Loudspeaker Sourcing Show (www.loudspeakersourcingshow.com)?

Philip: While conducting production tasks, I thought there should be a sourcing show that caters to the loudspeaker industry. I have spent years searching, cultivating, and investing in different cabinet suppliers, aluminum frame suppliers, crossover guys, and most recently, a new project requiring a plate amplifier from an amplifier factory that does not make or source completed systems. It’s senseless to create my own competition. So I thought, wouldn’t it be great to have a show just for loudspeaker companies to source components and products we need to complete a system. I asked around to see if a show like this existed and the answer was the same: no. So we are trying to solve this problem.

LIS: Since you recently announced the show, which is solely for the industry, how has it been received with brands and suppliers so far?

Philip: So far, the response received from European name brands as attendees has been very positive. For the large part, every company I have called has committed to attend and we will see many European manufacturers of components also exhibit. Many wish to come and be a part of the supply chain for the large OEMs in Asia.

LIS: What have been your biggest challenges putting this show together?



Philip: The single biggest challenge in putting together this show has been trying to come up with an answer when exhibitors and attendees ask why someone hasn’t done this before. I can only speculate that manufacturers don’t wish to reveal their supply chain sources, thus protecting their margins.

LIS: Any final comments?

Philip: I’m excited and looking forward to putting on The Loudspeaker Sourcing Show because it’s a much-needed event that will create its own excitement in the industry. The show—scheduled for October 9–11, 2015—will take place at the Nansha Grand Hotel in Guangzhou, China, which is a beautiful, wonderful, and timely location to host an industry show. We will see some of the famous designers, name brands, and manufacturers all under the same roof. That will provide a lot of opportunity for photo opportunities, fun, and hopefully a lot of business for everyone who attends. For more information, visit www.loudspeakersourcingshow.com. **LIS**

Audio Opportunities, Ltd.
CANADA

Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts

Audiopax Audio Systems
BRAZIL

Finished Systems (OEM/ODM) & Integrated Audio

Audiophil GmbH
GERMANY

Consultants & Designers, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio

Audiophiles Engineering
UNITED STATES

Consultants & Designers, Enclosures & Cabinets, Engineering Software, Passive Components/Crossovers/Wiring

Audio Precision
UNITED STATES

ALMA member, Engineering Software, Measurement Microphones, Test Equipment

Audio Pro, AB
SWEDEN

Cables & Connectors, Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Audiosoft
AUSTRALIA

Engineering Software

Audiostar Electronics Co., Ltd.
CHINA

ALMA member, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts

Audiovista
THAILAND

Cables & Connectors, Consultants & Designers, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Audioxplus, S.R.L.
ITALY

Consultants & Designers, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts

Auratron Systems
UNITED STATES

Consultants & Designers, Finished Systems (OEM/ODM) & Integrated Audio, Passive Components/Crossovers/Wiring, Speaker Parts

Auvio Netherlands, BV
NETHERLANDS

Consultants & Designers, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly

Avtek International
UNITED STATES

Consultants & Designers, Earphones & Headphones, Enclosures & Cabinets, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Axiomedia
ITALY

Amp/DSP/Network/Wireless Modules, Cables & Connectors, Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Microspeakers, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

B&C Speakers, S.p.A.
UNITED STATES

Enclosures & Cabinets, OEM Speaker Assembly, OEM Speakers & Drivers

B.W. Audio Guangzhou Co., Ltd.
CHINA

Consultants & Designers, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers

Bamberg Engineering
UNITED STATES

Consultants & Designers, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, Passive Components/Crossovers/Wiring

B&C Speakers, S.p.A.
ITALY

OEM Speakers & Drivers

BASSBOSS

UNITED STATES
Finished Systems (OEM/ODM) & Integrated Audio

Beach Dynamics, Inc.
UNITED STATES

ALMA member, Consultants & Designers, Test Equipment

Bennic Components
TAIWAN

OEM Speaker Assembly, Passive Components/Crossovers/Wiring

BeStar Technologies, Inc.
UNITED STATES

ALMA member, Consultants & Designers, Earphones & Headphones, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers

BESTON Technology Corp.
TAIWAN

Earphones & Headphones, OEM Speakers & Drivers

Bget
NETHERLANDS

Acoustic Solutions, Amp/DSP/Network/Wireless Modules, Cables & Connectors, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers, Speaker Parts

Bishopsound
UNITED KINGDOM

Cables & Connectors, Consultants & Designers, Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, Mic Capsules, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts

blue planet acoustic
GERMANY

OEM Speakers & Drivers, Passive Components/Crossovers/Wiring

BMS Speakers GmbH
GERMANY

OEM Speakers & Drivers

Bob Young and Associates
UNITED STATES

Acoustic Solutions, Consultants & Designers

Bogen Communications, Inc.
UNITED STATES

Amp/DSP/Network/Wireless Modules, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts

Böhmer Audio, AB
SWEDEN

Consultants & Designers, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, Test Equipment

Bomatec International Corp.
CANADA

Passive Components/Crossovers/Wiring, Speaker Parts

Brivox
UNITED STATES

Acoustic Solutions

Brüel & Kjær Sound & Vibration
Measurement A/S

DENMARK
Cables & Connectors, Engineering Software, Manufacturing Equipment, Measurement Microphones, Test Equipment

Brüel & Kjær Sound & Vibration
Measurement A/S

UNITED STATES
Cables & Connectors, Engineering Software, Manufacturing Equipment, Measurement Microphones, Test Equipment

BSWA Technology Co., Ltd.
CHINA

Cables & Connectors, Consultants & Designers, Engineering Software, Measurement Microphones, Mic Capsules, OEM Speakers & Drivers, Test Equipment

Cadillac Audio
UNITED STATES

Acoustic Solutions, Consultants & Designers, Enclosures & Cabinets,

Canadian Speaker Works
CANADA

Cables & Connectors, Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Canare Corp.
UNITED STATES

Cables & Connectors

Carl Tatz Design
UNITED STATES

Acoustic Solutions, Consultants & Designers

Carvin Corp.
UNITED STATES

Cables & Connectors, Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring

Celestion (UK Head Office)
UNITED KINGDOM

OEM Speakers & Drivers

Celestion (US Sales Office)
UNITED STATES

OEM Speakers & Drivers, Speaker Parts

Centrotherm Systemtechnik GmbH
GERMANY

Cables & Connectors, Consultants & Designers, OEM Speaker Assembly, Speaker Parts

CGN Audio Labs UNITED STATES

Consultants & Designers, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring

Chorus Audio Group ISRAEL

Cables & Connectors, Consultants & Designers, Enclosures & Cabinets, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Citadel (Bulk Molding Compounds, Inc.) UNITED STATES

Acoustic Solutions, Cables & Connectors, Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts

CJS Labs UNITED STATES

Consultants & Designers

Clarasonic THAILAND

Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts, Test Equipment

Cmple UNITED STATES

Cables & Connectors

Coby Speakers ISRAEL

Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Coherent Audio CANADA

Passive Components/Crossovers/Wiring,

Cotron Corp. TAIWAN

Consultants & Designers, Earphones & Headphones

Creative Sound Solutions CANADA

Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Crista Technologies FRANCE

Finished Systems (OEM/ODM) & Integrated Audio

Crystal Acoustics UNITED STATES

Earphones & Headphones, Enclosures & Cabinets, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers

Dai-ichi Electronics Manufacturing Corp. PHILIPPINES

Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, OEM Speakers & Drivers, Speaker Parts

Danville Signal Processing, Inc. UNITED STATES

ALMA member, Consultants & Designers, Earphones & Headphones, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Passive Components/Crossovers/Wiring

David Kennedy Associates UNITED STATES

Consultants & Designers

Dayton Audio UNITED STATES

Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

dB Design

UNITED STATES
Consultants & Designers, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers, Test Equipment

dB Technologies UNITED STATES

Finished Systems (OEM/ODM) & Integrated Audio

DC Audio

UNITED STATES
OEM Speaker Assembly, OEM Speakers & Drivers

Decibel Eng. Ind. BRAZIL

Cables & Connectors, Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

DEQX Pty., Ltd. AUSTRALIA

Consultants & Designers, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, Test Equipment

Digital Audio Labs UNITED STATES

Finished Systems (OEM/ODM) & Integrated Audio

Dimensions Acoustiques-Supravox CANADA

OEM Speakers & Drivers

Digmoda

UNITED STATES
Amp/DSP/Network/Wireless Modules,

Discovery Cable UNITED STATES

Cables & Connectors,

Dynakit, Inc.

UNITED STATES
Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, Passive Components/Crossovers/Wiring

Dynavox Electronics, Inc. UNITED STATES

Cables & Connectors, Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Eastern Asia Technology (HK) Ltd.-

Premier Sound Group CHINA

ALMA member, Amp/DSP/Network/Wireless Modules, Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Eighteen Sound ITALY

OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring

Electro Mavin UNITED STATES

Cables & Connectors, Enclosure Parts, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring

Elkhorn Acoustics, LLC UNITED STATES

Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones

ELP Corp. ITALY

Cables & Connectors, Enclosures & Cabinets, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers

eMagineFactory, LLC UNITED STATES

Consultants & Designers, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio

EMD Electronics, Ent. PHILIPPINES

Consultants & Designers

Eminence Speaker, LLC UNITED STATES

ALMA member, Enclosures & Cabinets, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring

Engineered Fibers Technology UNITED STATES

Speaker Parts

Enkor Electronics Co., Ltd. CHINA

Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers

EQUIPSON, S.A. SPAIN

Amp/DSP/Network/Wireless Modules, Finished Systems (OEM/ODM) & Integrated Audio

ESS Labs, LLC UNITED STATES

Earphones & Headphones, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring

estron A/S DENMARK

Cables & Connectors, Passive Components/Crossovers/Wiring, Speaker Parts

ETANI Electronics Co., Ltd. JAPAN

Acoustic Solutions, Amp/DSP/Network/Wireless Modules, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, Test Equipment

ETS-Lindgren UNITED STATES

Consultants & Designers, Test Equipment

ETON Deutschland Electro Acoustic GmbH GERMANY

OEM Speakers & Drivers

Europroducts Marketing, Ltd.

CANADA
Cables & Connectors, Earphones & Headphones

EuroTec International, Ltd.

TAIWAN
Cables & Connectors, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, Mic Capsules, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

EuroTec International, plc

UNITED KINGDOM
Cables & Connectors, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, Mic Capsules, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Excel Audio Systems

UNITED KINGDOM
Finished Systems (OEM/ODM) & Integrated Audio

Excelsior Audio Design & Services

UNITED STATES
Consultants & Designers, Engineering Software

FaitalPRO

ITALY
Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers, Speaker Parts, Test Equipment

Faital, S.p.A.

UNITED STATES
Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts, Test Equipment

Fane International

UNITED KINGDOM
Consultants & Designers, Enclosures & Cabinets, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Fantasy Motorsports

UNITED STATES
Cables & Connectors, Consultants & Designers, Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, Microspeakers, OEM Speaker Assembly

Ferrotec (USA) Corp.

UNITED STATES
ALMA member, Speaker Parts

Fisher Radio Corp.

UNITED STATES
Cables & Connectors, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring

Fluid Metering, Inc.

UNITED STATES
Manufacturing Equipment, Speaker Parts

Foam Speaker Grilles

UNITED STATES
Enclosure Parts

Fountek Electronics Co., Ltd.

CHINA
Amp/DSP/Network/Wireless Modules, Consultants & Designers, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers

Fujikon Industries Co., Ltd.

CHINA
Earphones & Headphones, Enclosure Parts, Engineering Software

G.R.A.S. Sound & Vibration

UNITED STATES
ALMA member, Cables & Connectors, Measurement Microphones, Test Equipment

Genelec Oy.

FINLAND
Amp/DSP/Network/Wireless Modules

Geometric Consulting

UNITED STATES
Consultants & Designers, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly

GGEC America, Inc.

UNITED STATES
Amp/DSP/Network/Wireless Modules, Finished Systems (OEM/ODM) & Integrated Audio, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers

Gingko Audio, Inc.

UNITED STATES
Cables & Connectors, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Global Audio Source, Inc.

UNITED STATES
Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Globe Audio Design, Inc.

UNITED STATES
Amp/DSP/Network/Wireless Modules, Consultants & Designers, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, Speaker Parts

Globe Plastics

UNITED STATES
ALMA member, Enclosures & Cabinets, Enclosure Parts, Mic Capsules, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts

GM Audio Technics, Ltd.

INDIA
Consultants & Designers, Enclosures & Cabinets, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Grand Inter Products

THAILAND
OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts

Green Acoustics

SWEDEN
Consultants & Designers, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio

Grund Audio Design

UNITED STATES
Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring

Haiyun Electronics Co., Ltd.

CHINA
Speaker Parts

Halford Loudspeakers

UNITED STATES
Finished Systems (OEM/ODM) & Integrated Audio

Harman do Brasil

BRAZIL
Earphones & Headphones, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, Microspeakers, OEM Speakers & Drivers

Hartley Loudspeakers, Inc.

UNITED STATES
OEM Speakers & Drivers

Hernon Manufacturing, Inc.

UNITED STATES
Manufacturing Equipment, Speaker Parts

Hill Acoustics, Ltd.

UNITED KINGDOM
Consultants & Designers, Earphones & Headphones, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Microspeakers, OEM Speakers & Drivers, Test Equipment

Hiphopn

DENMARK
OEM Speakers & Drivers

Hisco Precision Converting, Inc.

UNITED STATES
Cables & Connectors, Consultants & Designers, Earphones & Headphones, Enclosures & Cabinets, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Passive Components/Crossovers/Wiring, Speaker Parts

Huey Tung International Co., Ltd.

TAIWAN
Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Huizhou Fusheng Insulation Materials, Ltd.

CHINA
Speaker Parts

Hush Audio

UNITED KINGDOM
Consultants & Designers, OEM Speaker Assembly

Hypex Electronics, BV

UNITED STATES
ALMA member, Amp/DSP/Network/Wireless Modules, Finished Systems (OEM/ODM) & Integrated Audio, Speaker Parts

IdEA

FRANCE
Consultants & Designers, Earphones & Headphones, Finished Systems (OEM/ODM) & Integrated Audio

Inlow Sound

UNITED STATES
Consultants & Designers, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio

Innova Engineering, Inc.

INDIA
Consultants & Designers, Enclosures & Cabinets, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, OEM Speaker Assembly, OEM Speakers & Drivers

Integrated Audio Technologies, LLC

UNITED STATES
Acoustic Solutions, Amp/DSP/Network/Wireless Modules, Consultants & Designers

iSEMcon GmbH
GERMANY
Measurement Microphones

Iwai Electronics Pvt., Ltd.
INDIA
Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring

J.A. McKinney & Assoc., LLC
UNITED STATES
Consultants & Designers

Jan Piet de Vries
NETHERLANDS
Consultants & Designers

Jantzen Audio Denmark
DENMARK
Cables & Connectors, Enclosures & Cabinets, Enclosure Parts, Passive Components/Crossovers/Wiring

JBL Selenium
UNITED STATES
OEM Speaker Assembly, OEM Speakers & Drivers

JLI Electronics, Inc.
UNITED STATES
Cables & Connectors, Consultants & Designers, Earphones & Headphones, Measurement Microphones, Mic Capsules

JOCAVI
PORTUGAL
Acoustic Solutions, Consultants & Designers

JP Electronics Design
UNITED STATES
Consultants & Designers

K & K Development
DENMARK
ALMA member, Consultants & Designers

Kadeton Audio Co., Ltd.
CHINA
Enclosures & Cabinets, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly

Kamperman Engineering
NETHERLANDS
Acoustic Solutions, Consultants & Designers

KBL Systems
NETHERLANDS
Cables & Connectors, Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Kinetic Audio International, Ltd.
UNITED STATES
Consultants & Designers, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Klippel GmbH
GERMANY
ALMA member, Test Equipment

Kludge Audio
UNITED STATES
Consultants & Designers

Kmaxima Group
TAIWAN
Cables & Connectors, Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Kramer Electronics
UNITED STATES
Cables & Connectors, Finished Systems (OEM/ODM) & Integrated Audio, Test Equipment

Kravchenko-Audio
CANADA
Consultants & Designers, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers

Kwanasia Electronics Co., Ltd.
CHINA
Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, Speaker Parts

Kyu Systems
FRANCE
Acoustic Solutions, Cables & Connectors, Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, Mic Capsules, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Lamart Corp.
UNITED STATES
OEM Speaker Assembly, Speaker Parts

LaVoce Co., Ltd.
ITALY
OEM Speakers & Drivers

Lenard Audio Pty., Ltd.
AUSTRALIA
Consultants & Designers

Levister Audio
UNITED STATES
Finished Systems (OEM/ODM) & Integrated Audio

Linn Audio Loudspeakers
UNITED STATES
Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers

Lipinski Sound
UNITED STATES
Cables & Connectors, Consultants & Designers, Finished Systems (OEM/ODM) & Integrated Audio

Listen Audio Systems, Inc.
UNITED STATES
Acoustic Solutions, Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Listen, Inc.
UNITED STATES
ALMA member, Engineering Software, Measurement Microphones, Test Equipment

LMH Loudspeakers
CANADA
Finished Systems (OEM/ODM) & Integrated Audio

Logitech
TAIWAN
ALMA member

Lorantz Audio Services Pty., Ltd.
AUSTRALIA
Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

LOUDSOFT, Ltd.
DENMARK
Acoustic Solutions, ALMA member, Consultants & Designers, Engineering Software, Manufacturing Equipment, Measurement Microphones, OEM Speakers & Drivers, Test Equipment

Loudspeaker Components
UNITED STATES
ALMA member, Speaker Parts

Loudspeakers Plus
UNITED STATES
Cables & Connectors, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring

Lowell Manufacturing Co.
UNITED STATES
Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, Passive Components/Crossovers/Wiring

Lowther Speakers USA
UNITED STATES
OEM Speakers & Drivers

LPG (Lautsprecher Produktions Gesellschaft)
GERMANY
OEM Speakers & Drivers

Macpherson Audio
UNITED STATES
Consultants & Designers

Maeden International, Ltd.
TAIWAN
Cables & Connectors, Consultants & Designers, Earphones & Headphones, Passive Components/Crossovers/Wiring, Speaker Parts

Madison Fielding, Inc.
UNITED STATES
Finished Systems (OEM/ODM) & Integrated Audio

MAG
UKRAINE
Cables & Connectors, Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Magnet, Ltd.
UKRAINE
Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Marchand Electronics, Inc.
UNITED STATES
Consultants & Designers, Finished Systems (OEM/ODM) & Integrated Audio, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Martin Sound Products
UNITED STATES
Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Materion Electrofusion
UNITED STATES
ALMA member, Speaker Parts

Megatec, AG
SWITZERLAND
Manufacturing Equipment, Test Equipment

Meniscus Audio Group, Inc.
UNITED STATES
Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Menlo Scientific, Ltd.
UNITED STATES
ALMA member, Consultants & Designers

Microtech Gefell GmbH
GERMANY

Midgard Audio
NORWAY
Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts

Millon Loudspeakers
NETHERLANDS
Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Minnetonka Audio Software, Inc.
UNITED STATES
Consultants & Designers

MISCO
UNITED STATES
ALMA member, Amp/DSP/Network/Wireless Modules, Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Morel, Ltd.
ISRAEL
ALMA member, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers

Motus Audio
UNITED STATES
OEM Speakers & Drivers

MSC Software
UNITED STATES
Engineering Software

M-Sound Electronics Co., Ltd.
CHINA
Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers

NedLab
UNITED STATES
Acoustic Solutions, Consultants & Designers, Finished Systems (OEM/ODM) & Integrated Audio, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

New Millennium Acoustics
UNITED STATES
Cables & Connectors, Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

New Trades
NETHERLANDS
Consultants & Designers, Speaker Parts

NMA Acoustics
UNITED STATES
Acoustic Solutions, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Passive Components/Crossovers/Wiring, Test Equipment

Nordson EFD
UNITED STATES
ALMA member, Manufacturing Equipment

North Reading Engineering
UNITED STATES
Acoustic Solutions, Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

NSMT Loudspeakers
UNITED STATES
Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly

NTI Americas, Inc.
UNITED STATES
ALMA member, Test Equipment

NTi Audio
UNITED STATES
Measurement Microphones, Test Equipment

Oberton
BULGARIA
OEM Speakers & Drivers

OBE Pro Audio Co., Ltd.
CHINA
Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts

Ocean Sound Technology, Ltd.
CHINA
Consultants & Designers, Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

OEB, S.R.L.
ITALY
Speaker Parts

OHM (UK), Ltd.
UNITED KINGDOM
Amp/DSP/Network/Wireless Modules, Enclosures & Cabinets

One Magnet Electronic Co., Ltd.
CHINA
Speaker Parts

Orb Audio, LLC
UNITED STATES
Cables & Connectors, Consultants & Designers, Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers

ORCA Design and Manufacturing
UNITED STATES
Acoustic Solutions, Consultants & Designers, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring

Outline, S.R.L.
ITALY
Finished Systems (OEM/ODM) & Integrated Audio

Pacific Audio Consulting
UNITED STATES
ALMA member, Consultants & Designers

Pacific Transformer Corp.
UNITED STATES
Consultants & Designers, Finished Systems (OEM/ODM) & Integrated Audio, Passive Components/Crossovers/Wiring

PACSYS, Ltd.
UNITED KINGDOM
Engineering Software

Parsa Electric
IRAN
Speaker Parts

Parts Express
UNITED STATES
Acoustic Solutions, ALMA member, Amp/DSP/Network/Wireless Modules, Cables & Connectors, Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Pazandeh Audio Designs
UNITED STATES
Consultants & Designers, Enclosures & Cabinets, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers

PCB Piezotronics
UNITED STATES
Acoustic Solutions, ALMA member, Measurement Microphones

Peavey Electronics
UNITED STATES
Amp/DSP/Network/Wireless Modules,, Cables & Connectors, Earphones & Headphones, Engineering Software

Peter Duminy-Loudspeaker Research & Design (DLC)
CANADA
Acoustic Solutions, Amp/DSP/Network/Wireless Modules, Cables & Connectors, Consultants & Designers, Earphones & Headphones, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Physical Lab
GERMANY
Acoustic Solutions, Consultants & Designers, Engineering Software, Measurement Microphones, Test Equipment

Pioneer Hill Software
UNITED STATES
Engineering Software, Test Equipment

Planet_10 hi-fi
CANADA
Consultants & Designers, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers

Planot, LLC
UNITED STATES
Consultants & Designers

PowerBass USA
UNITED STATES
OEM Speakers & Drivers

COMPANY COMPENDIUM

Power Electronics & Technologies INDIA

Cables & Connectors, Consultants & Designers, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, Passive Components/Crossovers/Wiring, Speaker Parts

Powersoft ITALY

Amp/DSP/Network/Wireless Modules

PR Audio

UNITED STATES

Acoustic Solutions, Consultants & Designers

Precision Devices, Ltd.

UNITED KINGDOM

ALMA member, Consultants & Designers, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts, Test Equipment

Precision Econowind, Inc.

UNITED STATES

Speaker Parts

Precision Transducer Engineering (PTE)

UNITED STATES

Finished Systems (OEM/ODM) & Integrated Audio

Premium Sound Solutions

BELGIUM

Amp/DSP/Network/Wireless Modules, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts

Primrose Audio Design, Inc.

CANADA

Consultants & Designers, Passive Components/Crossovers/Wiring

Professional Audio, SNC

ITALY

Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Pro Sound Testing, Inc.

UNITED STATES

Acoustic Solutions, Amp/DSP/Network/Wireless Modules, Engineering Software, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio

PRV Audio Brazil

BRAZIL

ALMA member, Enclosures & Cabinets, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Prescient Audio Manufacturing, LLC UNITED STATES

ALMA member

Psychoacoustics

UNITED STATES

Consultants & Designers, Enclosures & Cabinets, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio

PUI Audio, Inc.

UNITED STATES

Earphones & Headphones, Finished Systems (OEM/ODM) & Integrated Audio, Mic Capsules, Microspeakers, OEM Speakers & Drivers

QSC Audio Products, LLC

UNITED STATES

ALMA member, Finished Systems (OEM/ODM) & Integrated Audio

R&D Team Software Development

GERMANY

Engineering Software

Raw Acoustics

CANADA

Acoustic Solutions, Consultants & Designers, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Passive Components/Crossovers/Wiring, Test Equipment

RBH Sound

UNITED STATES

Consultants & Designers, Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

RCF

UNITED STATES

Enclosures & Cabinets, OEM Speakers & Drivers

RCF, S.p.A.

ITALY

Acoustic Solutions, Amp/DSP/Network/Wireless Modules, Earphones & Headphones, Enclosures & Cabinets, OEM Speakers & Drivers

Reckhorn, Ltd.

GERMANY

Amp/DSP/Network/Wireless Modules, Consultants & Designers, OEM Speakers & Drivers

REFERENCE 3A

CANADA

Cables & Connectors, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio

Renkus-Heinz, Inc.

UNITED STATES

Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio

Revolver Audio, Ltd.

UNITED KINGDOM

Cables & Connectors, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly

Rocking Class Electronics

UNITED STATES

Finished Systems (OEM/ODM) & Integrated Audio, Passive Components/Crossovers/Wiring

Role Audio

UNITED STATES

Finished Systems (OEM/ODM) & Integrated Audio

RSL Speaker Systems

UNITED STATES

Finished Systems (OEM/ODM) & Integrated Audio

S.S. Electronics

INDIA

Cables & Connectors, Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

SAE

THAILAND

Consultants & Designers, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, OEM Speaker Assembly, OEM Speakers & Drivers, Test Equipment

Sanming Sound

UNITED STATES

OEM Speakers & Drivers

SB Acoustics/Sinar Baja Electric

INDONESIA

Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers, Speaker Parts

SC Poweraudio, S.R.L.

ROMANIA

Acoustic Solutions, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly

Scan-Speak A/S

DENMARK

OEM Speakers & Drivers

Scantek, Inc.

UNITED STATES

Engineering Software, Measurement Microphones, Test Equipment

Schurter, Inc.

UNITED STATES

Cables & Connectors

Sea Galleon International, Ltd.

CHINA

Manufacturing Equipment, OEM Speaker Assembly, Passive Components/Crossovers/Wiring, Speaker Parts

SEAS Fabrikker A/S

NORWAY

ALMA member, Acoustic Solutions, Amp/DSP/Network/Wireless Modules, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers

Shenzhen Tekzone Loudspeaker Co., Ltd.

CHINA

Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers, Test Equipment

Sherwood Industries, Inc.

UNITED STATES

Speaker Parts, Test Equipment

SIEA

DENMARK

Cables & Connectors, Consultants & Designers, Earphones & Headphones, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Speaker Parts, Test Equipment

Sievers Audio Corp.

UNITED STATES

Consultants & Designers

Simply Speakers

UNITED STATES

Enclosure Parts, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Smith and Larson Audio

UNITED STATES

Consultants & Designers, Engineering Software, Measurement Microphones, Test Equipment

SMRjr Product Development Specialists, LLC

UNITED STATES

Consultants & Designers

SoCal Sound Shop

UNITED STATES

Consultants & Designers

Solen Electronique, Inc.

CANADA

Cables & Connectors, Consultants & Designers, Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Solidex Manufacturing Group, LLC
UNITED STATES
Earphones & Headphones, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring

Solway
UNITED STATES
ALMA member, Enclosures & Cabinets, Enclosure Parts, OEM Speaker Assembly

Sonic Craft, Inc.
UNITED STATES
Acoustic Solutions, Cables & Connectors, Enclosure Parts, OEM Speaker Assembly, Passive Components/Crossovers/Wiring

Soniclab
POLAND
Consultants & Designers, Earphones & Headphones, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Soundlabs Group Pty., Ltd.
AUSTRALIA
Acoustic Solutions, AMP/DSP/Network & Wireless Modules, Cables & Connectors, Enclosure Parts, Passive Components/Crossovers/Wiring, Speaker Parts

Soundcare, A/S
NORWAY
Enclosures & Cabinets

SoundKinetics, Inc.
UNITED STATES
Consultants & Designers, Engineering Software

Sound Lab, Inc.
UNITED STATES
Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers

Sound & Lighting Systems
UNITED STATES
Enclosures & Cabinets, OEM Speaker Assembly, OEM Speakers & Drivers

Sounds-Good Audio Solutions
GERMANY
Cables & Connectors, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, Mic Capsules, OEM Speaker Assembly

Sound Projects
NETHERLANDS
Consultants & Designers, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio

Sound Sources Technology, Inc.
UNITED STATES
Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Sound Technology Development, Ltd.
CHINA
Cables & Connectors, Consultants & Designers, Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Space-Tech Lab., Ltd.
CANADA
Amp/DSP/Network/Wireless Modules, Cables & Connectors, Consultants & Designers, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, OEM Speaker Assembly, Passive Components/Crossovers/Wiring, Test Equipment

Speaker Art
UNITED STATES
Consultants & Designers, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, Passive Components/Crossovers/Wiring

Speaker Clinic
UNITED STATES
Consultants & Designers, Engineering Software, Test Equipment

SpeakerAddict
UNITED STATES
Amp/DSP/Network/Wireless Modules, Cables & Connectors, Earphones & Headphones, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

SpeakerLAB, S.R.L.
ITALY
Cables & Connectors, Consultants & Designers, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Test Equipment

SPOORT.NU
NETHERLANDS
Cables & Connectors, Consultants & Designers, Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Stager Silver Solids
UNITED STATES
Cables & Connectors

Standard Audio Systems, AB
SWEDEN
Consultants & Designers

Stanford Research Systems
UNITED STATES
Test Equipment

StanleyMarquiss.com
UNITED STATES
Acoustic Solutions, Consultants & Designers, Earphones & Headphones, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers

Stiernberg Consulting
UNITED STATES
Consultants & Designers

Stones Sound Studio
AUSTRALIA
Cables & Connectors, Consultants & Designers, Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Stroud Audio, Inc.
UNITED STATES
Consultants & Designers

Studio Electric
UNITED STATES
Consultants & Designers, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly

Studio Reference Monitors
CANADA
Consultants & Designers, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts

Sunlight Electronics Laboratory
TAIWAN
Test Equipment

Sun Technique Electric Co., Ltd.
CHINA
Cables & Connectors, Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Supergauss Produtos Magneticos, Ltd.
BRAZIL
Enclosures & Cabinets, Speaker Parts

Suzuki Kanshi (Thailand) Co., Ltd.
THAILAND
Consultants & Designers, Speaker Parts

Sveda Audio
POLAND
Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, Speaker Parts

Sweetbeet Sound
CANADA
Acoustic Solutions

System Studio
POLAND
Consultants & Designers

TB Speaker Co., Ltd.
TAIWAN
OEM Speaker Assembly, OEM Speakers & Drivers

TC Sounds
UNITED STATES
OEM Speakers & Drivers

Tectonic Elements, Ltd.
UNITED KINGDOM
Consultants & Designers, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers

tg-acoustics
NETHERLANDS
Acoustic Solutions, Consultants & Designers, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, Passive Components/Crossovers/Wiring

THD Design
BELGIUM
Acoustic Solutions, Consultants & Designers

the BEE

NETHERLANDS

Cables & Connectors, Consultants & Designers, Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

The Canadian Loudspeaker Corp.

CANADA

Cables & Connectors, Consultants & Designers, Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

The Eraser Company, Inc.

UNITED STATES

Manufacturing Equipment

TitanAudio, Ltd.

UNITED STATES

Consultants & Designers, OEM Speaker Assembly

TMI Engineering

UNITED STATES

Acoustic Solutions, Amp/DSP/ Network/Wireless Modules, Consultants & Designers, Passive Components/Crossovers/Wiring

Tone Tubby, Inc.

UNITED STATES

Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly

Tortech Engineered Sound

Products

CANADA

Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, Measurement Microphones, Mic Capsules, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Transducer Lab

UNITED STATES

Acoustic Solutions, Consultants & Designers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Trax Audio

UNITED STATES

Consultants & Designers, Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Trent Engineering

INDIA

Cables & Connectors, Consultants & Designers, Earphones & Headphones, Enclosures & Cabinets, Enclosure Parts, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Mic Capsules, Microspeakers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Trueanalog Strictly OEM

Drivers

CHINA

ALMA member, Amp/DSP/ Network/Wireless Modules, Enclosure Parts, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts

True Technologies, Inc.

UNITED STATES

Acoustic Solutions, ALMA member, Consultants & Designers, Earphones & Headphones, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, Measurement Microphones, Test Equipment

TSG Audio

UNITED STATES

Amp/DSP/Network/Wireless Modules, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers

TXR Custom Car Audio

UNITED STATES

Finished Systems (OEM/ODM) & Integrated Audio

Tymphony

UNITED STATES

Amp/DSP/Network/Wireless Modules, Earphones & Headphones, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers

UKD, Ltd.

UNITED KINGDOM

Finished Systems (OEM/ODM) & Integrated Audio

Under Cover

UNITED STATES

Finished Systems (OEM/ODM) & Integrated Audio

University of Vienna

AUSTRIA

Test Equipment

UpTone Audio, LLC

UNITED STATES

Passive Components/Crossovers/Wiring

Vance Dickason Consulting

UNITED STATES

ALMA member, Consultants & Designers

Vermouth Audio

INDONESIA

Cables & Connectors

Vertek/XTC

UNITED STATES

Acoustic Solutions, Consultants & Designers, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Vicoustic

PORTUGAL

Acoustic Solutions

Vidyut Teletronics, Ltd.

INDIA

Cables & Connectors, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Volt Loudspeakers, Ltd.

UNITED KINGDOM

Consultants & Designers, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring

Warkwyn Associates, Inc.

CANADA

ALMA member, Consultants & Designers, Engineering Software, Measurement Microphones, Test Equipment

Wavecor, Ltd.

CHINA

ALMA member, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers

WebMagnetics, Inc.

UNITED STATES

Consultants & Designers, Speaker Parts

Wellmax Co., Ltd.

TAIWAN

Cables & Connectors, Earphones & Headphones, Speaker Parts

Westlake Audio

UNITED STATES

Cables & Connectors, Finished Systems (OEM/ODM) & Integrated Audio

Wired 4 Sound, Inc.

UNITED STATES

Consultants & Designers,

Wireworld Cable Technology

UNITED STATES

Cables & Connectors,

WiSound

GREECE

Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly

Wizard India Private, Ltd.

INDIA

Enclosures & Cabinets, Enclosure Parts, Finished Systems (OEM/ODM) & Integrated Audio, OEM Speaker Assembly, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts

Wolf von Langa

GERMANY

Cables & Connectors, Consultants & Designers, Enclosures & Cabinets, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, OEM Speakers & Drivers, Passive Components/Crossovers/Wiring, Speaker Parts, Test Equipment

Woods Engineering

SPAIN

Consultants & Designers, Engineering Software, Measurement Microphones, Test Equipment

Yorba Acoustics

UNITED STATES

Enclosures & Cabinets, Finished Systems (OEM/ODM) & Integrated Audio

Zenith Audio Electronics Co., Ltd.

CHINA

Zhejiang Innuovo Loudspeaker

Co., Ltd.

CHINA

Finished Systems (OEM/ODM) & Integrated Audio, Microspeakers, OEM Speaker Assembly

Zuhai HiVi Technology Co., Ltd.

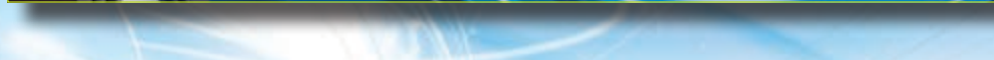
CHINA

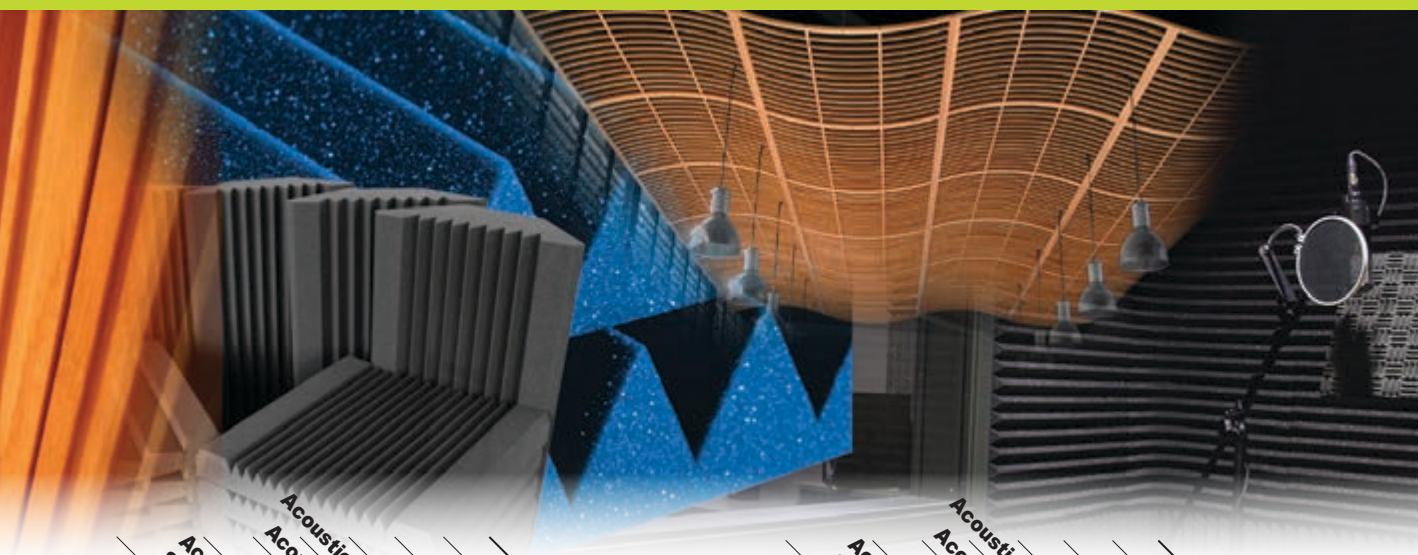
Consultants & Designers, Enclosures & Cabinets, Engineering Software, Finished Systems (OEM/ODM) & Integrated Audio, Manufacturing Equipment, OEM Speaker Assembly, OEM Speakers & Drivers, Speaker Parts, Test Equipment

Zu Audio

UNITED STATES

Enclosures & Cabinets





	Acoustic Treatment Panels	Noise Control	Sound Isolation	Soundbooths	Acoustic Measurement	Acoustic Doors	Acoustic Consultancy Services & Design
AUSTRALIA Soundlabs Group Pty., Ltd.			•				•
BELGIUM THD Design	•		•				
CANADA Peter Duminy - Loudspeaker Research & Design (DLC)	•	•					
Raw Acoustics		•					
Solen Electronique, Inc.		•	•				•
Sweetbeet Sound				•			
DENMARK LOUDSOFT, Ltd.	•	•					
FRANCE Kyu Systems	•						
GERMANY ATE (Audio Technology Engineering)	•	•					
Physical Lab	•	•					
ITALY RCF, S.p.A	•						
JAPAN ETANI Electronics Co., Ltd.		•	•	•			
MEXICO Aletheia AV	•	•	•	•	•	•	•
NETHERLANDS Bget			•	•			•
Kamperman Engineering	•	•	•				
tg-acoustics	•						
NORWAY SEAS Fabrikker A/S	•	x	•				

	Acoustic Treatment Panels	Noise Control	Sound Isolation	Soundbooths	Acoustic Measurement	Acoustic Doors	Acoustic Consultancy Services & Design
PORTUGAL JOCAVI	•	•	•	•			•
Vicoustic	•	•	•	•	•	•	•
ROMANIA SC Poweraudio, S.R.L.	•		•				
UNITED KINGDOM Alacritty Audio	•						
UNITED STATES ACO Pacific, Inc.		•	•				
AcousTex Fabrics		•					
Acoustics First Corp.		•	•				•
Bob Young & Associates	•						
Brivox	•	•	•	•			•
Cadillac Audio	•		•	•			•
Carl Tatz Design	•	•	•	•			•
Citadel (Bulk Molding Compounds, Inc.)	•						
Integrated Audio Technologies, LLC	•	•					
Listen Audio Systems, Inc.	•		•				
NedLab	•	•					
NMA Acoustics	•	•					
North Reading Engineering	•	•					
ORCA Design and Manufacturing			•				
Parts Express		•					
PCB Piezotronics		•	•				
PR Audio	•	•					
Pro Sound Testing, Inc.	•	•					
Sonic Craft, Inc.			•	•			•
StanleyMarquiss.com	•		•	•			
TMI Engineering	•	•	•	•	•	•	•
Transducer Lab, LLC	•						
True Technologies, Inc.	•	•		•			•
Vertek/XTC	•	•					

AMP, DSP, NETWORK, AND WIRELESS MODULES



Wireless Connectivity
Network Processing
Digital Signal
Amplification Modules

Wireless Connectivity
Network Processing
Digital Signal
Amplification Modules

	Wireless Connectivity	Network Processing	Digital Signal	Amplification Modules
AUSTRALIA Soundlabs Group Pty., Ltd.	•			
BELGIUM Premium Sound Solutions	•	•	•	•
CANADA Peter Duminy - Loudspeaker Research & Design (DLC)		•		•
Solen Electronique, Inc.	•	•		•
Space-Tech Lab., Ltd.	•			
CHINA Fountek Electronics Co., Ltd.	•	•		•
Trueanalog Strictly OEM Drivers	•	•		
FINLAND Genelec, Oy.	•	•		
GERMANY ATE (Audio Technology Engineering)	•	•		
Reckhorn, Ltd.	•	•		
ITALY Axiomedia, S.R.L.	•	•		•
Powersoft	•	•		
RCF, S.p.A	•	•		
JAPAN ETANI Electronics Co., Ltd.	•	•		
NETHERLANDS Bget	•	•	•	

	Wireless Connectivity	Network Processing	Digital Signal	Amplification Modules
NORWAY SEAS Fabrikker A/S	•	•	•	•
SPAIN EQUIPSON, S.A.	•	•		
SWEDEN Anaview (ETAL Group)	•			
SWITZERLAND Archwave		•	•	•
UNITED KINGDOM OHM (UK), Ltd.	•	•		
UNITED STATES Area52RnD	•	•		
Bogen Communications, Inc.		•	•	
Digmoda	•	•		
Eastern Asia Technology (HK), Ltd.	•	•	•	•
GSEC America, Inc.	•			•
Globe Audio Design, Inc.	•	•	•	
Hypex Electronics, BV	•	•		
Integrated Audio Technologies, LLC	•	•		•
MISCO	•	•		
Parts Express		•		
Peavey Electronics	•	•	•	•
Pro Sound Testing, Inc.	•			
SpeakerAddict	•	•		•
TMI Engineering		•	•	•
TSG Audio	•	•	•	
Tymphany	•		•	•

CABLES & CONNECTORS



	Wire Channel	Connectors	Cables
AUSTRALIA			
Stones Sound Studio	•		
Soundlabs Group Pty., Ltd.	•	•	
BRAZIL			
Advanced Audio Technologies	•		
Decibel Eng. Ind.	•	•	•
CANADA			
Canadian Speaker Works	•	•	
Europroducts Marketing, Ltd.	•	•	
Peter Duminy - Loudspeaker Research & Design (DLC)	•	•	
REFERENCE 3A	•		
Solen Electronique, Inc.	•	•	
Space-Tech Lab., Ltd.	•		
The Canadian Loudspeaker Corp.	•		
CHINA			
BSWA Technology Co., Ltd.	•	•	•
Sound Technology Development, Ltd.	•	•	•
Sun Technique Electric Co., Ltd.	•	•	•
DENMARK			
estron a/s	•	•	
Jantzen Audio Denmark	•	•	
SIEA	•		
FRANCE			
Kyu Systems		•	•
GERMANY			
Akustik Perfekt	•	•	
Centrotherm Systemtechnik GmbH		•	
Sounds-Good Audio Solutions	•	•	
Wolf von Langa	•		
INDIA			
Power Electronics & Technologies	•	•	
S.S. Electronics		•	
Trent Engineering		•	
Vidyut Teletronics, Ltd.	•		•

	Wire Channel	Connectors	Cables
INDONESIA			
Vermouth Audio	•	•	
ISRAEL			
Chorus Audio Group	•	•	•
ITALY			
Audiomatica, S.R.L.	•		
Axiomedia, S.R.L.	•	•	
ELP Corp.			•
SpeakerLAB, S.R.L.			•
MEXICO			
Aletheia AV	•		
NETHERLANDS			
Bget	•	•	
KBL Systems	•	•	•
SPOORT.NU	•	•	•
the BEE		•	
SWEDEN			
Audio Pro, AB	•		
TAIWAN			
EuroTec International, Ltd.	•	•	
Kmaxima Group		•	
Maeden Innovation Co., Ltd.	•	•	•
Wellmax Co., Ltd.	•		
THAILAND			
Audiovista	•	•	
UKRAINE			
MAG	•	•	•
UNITED KINGDOM			
Bishopsound	•	•	
EuroTec International, plc	•	•	
Revolver Audio, Ltd.	•	•	
UNITED STATES			
AMS Audio Enterprises, Inc.	•	•	
AntiCable Audio Co., Inc.	•	•	

	Wire Channel	Connectors	Cables
Area52RnD	•	•	
Audio Media Group	•		
Audiofly, Pty., Ltd.	•		
Brüel & Kjær Sound & Vibration Measurement A/S	•		
Canare Corp.	•	•	
Carvin Corp.	•	•	
Citadel (Bulk Molding Compounds, Inc.)		•	
Cmple	•	•	•
Discovery Cable	•	•	
Dynavox Electronics, Inc.	•	•	
Electro Mavin		•	
Fantasy Motorsports	•	•	•
Fisher Radio Corp.		•	
G.R.A.S. Sound & Vibration		•	
Gingko Audio, Inc.	•		
Hisco Precision Converting, Inc.			•
JLI Electronics, Inc.	•		
Kramer Electronics	•	•	
Lipinski Sound	•		
Loudspeakers Plus		•	
New Millennium Acoustics	•		
Orb Audio, LLC	•		
Parts Express	•	•	
Peavey Electronics	•	•	
Schurter, Inc.	•	•	
Sonic Craft, Inc.	•	•	
SpeakerAddict		•	
Stager Silver Solids	•		
Westlake Audio	•		
Wireworld Cable Technology	•	•	

DEQX Pty., Ltd.
Lenard Audio Pty., Ltd.
Lorantz Audio Services Pty., Ltd.
Stones Sound Studio

THD Design

Advanced Audio Technologies
Decibel Eng. Ind.

Audio-Concept (G.C.)
Audio Opportunities, Ltd.
Canadian Speaker Works
Kravchenko-Audio
Peter Duminy - Loudspeaker Research & Design (DLC)
Planet_10 hi-fi
Primrose Audio Design, Inc.
Raw Acoustics
Solen Electronique, Inc.
Space-Tech Lab., Ltd.
Studio Reference Monitors
The Canadian Loudspeaker Corp.
Warkwyn Associates, Inc.

BSWA Technology Co., Ltd.
B.W. Audio Guangzhou Co., Ltd.
Fountek Electronics Co., Ltd.
Ocean Sound Technology, Ltd.
Sound Technology Development, Ltd.
Sun Technique Electric Co., Ltd.
Zhuhai HiVi Technology Co., Ltd.

K & K Development
LOUDSOFT, Ltd.
SIEA

Kyu Systems
IDeA

Akustik Perfekt
ATE (Audio Technology Engineering)
Audiophil GmbH
Centrotherm Systemtechnik GmbH
Physical Lab
Reckhorn, Ltd.
Wolf von Langa

GM Audio Technics, Ltd.
Innova Engineering, Inc.
Power Electronics & Technologies
S.S. Electronics
Trent Engineering

Chorus Audio Group

Audiomarin, SNC
Audiomatica, S.R.L.
Audioxplus, S.R.L.
Axiomedia, S.R.L.
SpeakerLAB, S.R.L.

Acoustic Power Lab

Acoustics Lab
Audio Labs

Aletheia AV

Auvio Netherlands, BV
Jan Piet de Vries
Kamperman Engineering
KBL Systems
Millon Loudspeakers
New Trades
Sound Projects
SPOORT.NU
tg-acoustics
the BEE

Midgard Audio

EMD Electronics, Ent.

Soniclab
System Studio

JOC AVI

Woods Engineering

Böhrer Audio, AB
Green Acoustics
Standard Audio Systems, AB

Cotron Corp.
Maeden Innovation Co., Ltd.

Audiovista
SAE
Suzuki Kanshi (Thailand) Co., Ltd.

Magnet, Ltd.

Alacrity Audio
Bishopsound
Fane International
Hill Acoustics, Ltd.
Hush Audio
Precision Devices, Ltd.
Tectonic Elements, Ltd.
Volt Loudspeakers, Ltd.

Advanced Transduction
Aempyrean, Inc.
ALMA International
Apollonio Consulting

RBH Sound
Sieves Audio Corp.
Smith and Larson Audio
SMRjr Product Development Specialists, LLC
SoCal Sound Shop
SoundKinetics, Inc.
Speaker Art
Speaker Clinic
StanleyMarquiss.com
Stiernberg Consulting
Stroud Audio, Inc.
Studio Electric
TitanAudio, Ltd.
TMI Engineering
Transducer Lab, LLC
Trax Audio
True Technologies, Inc.
Vance Dickason Consulting
Vertek/XTC
Waterfall Audio
WebMagnetics, Inc.
Wired 4 Sound, Inc.



over 30 years experience in

TV - 3D - surround - residential

Aviation industry

HiFi & PA loudspeaker



cars - trucks - buses - boats

dsp wifi class-D amps

speaker technology recording studios

*P2C & P2F
cone technology*

*FBS
flat bass speaker*

*FDS
flat drive speaker*

*ESL
the Transar*



ATE - Norman Gerkinsmeyer - Germany - 89231 NU
Phone +49 731 1766 2271 - email a.t.e@t-online.de - www.p2ccone.com

	Headphones	Earphones
TAIWAN		
BESTON Technology Corp.		●
Cotron Corp.	●	●
Huey Tung International Co., Ltd.	●	●
Maeden Innovation Co., Ltd.	●	●
Wellmax Co., Ltd.	●	
UKRAINE		
MAG	●	●
UNITED KINGDOM		
Bishopsound	●	●
Hill Acoustics, Ltd.		●
UNITED STATES		
American Bass USA	●	●
Audia Media Group	●	●
Audiofly, Pty., Ltd.		●
Avtek International	●	●
BeStar Technologies Inc.		●
Crystal Acoustics	●	●
Danville Signal Processing, Inc.		●
Eastern Asia Technology (HK), Ltd.	●	●
ESS Labs, LLC		●
Fantazy Motorsports	●	●
Hisco Precision Converting, Inc.	●	●
JLI Electronics, Inc.	●	●
Orb Audio, LLC		●
Parts Express	●	●
Peavey Electronics		●
PUI Audio, Inc.	●	
RBH Sound	●	●
SpeakerAddict		●
Solidex Manufacturing Group, LLC		●
StanleyMarquiss.com		●
True Technologies, Inc.	●	●
Tymphany		●

ENCLOSURES & CABINETS



	Baffles		Finished Cabinets		Sub-Assemblies		Materials		Rigging	
	Ceiling Speaker Plates	In-Wall Plates	Box Arrays (PA)	Bulk Molding Compound	MDF (Fiberboard)	Paper/Paper Pulp	Wound Geometric Tubes	Panels	Panels	Rigging
AUSTRALIA										
Lorantz Audio Services Pty., Ltd.				•					•	•
Stones Sound Studio										
BELGIUM										
Premium Sound Solutions				•						
BRAZIL										
Advanced Audio Technologies				•	•					
AMCP Electronics	•	•								
Decibel Eng. Ind.			•	•	•	•		•	•	•
PRV Audio Brazil			•	•	•					
Supergauss Produtos Magneticos, Ltd.						•				
CANADA										
Audio-Concept (G.C.)								•	•	
Audio Opportunities, Ltd.								•	•	
Canadian Speaker Works								•	•	•
Creative Sound Solutions				•	•					
Planet 10 hi-fi				•						
Solen Electronique, Inc.	•	•		•	•					
Space-Tech Lab., Ltd.				•	•		•			
Studio Reference Monitors				•						
The Canadian Loudspeaker Corp.								•	•	
Tortech Sound, Inc.								•	•	
CHINA										
Eastern Asia Technology (HK) Ltd.								•	•	
- Premier Sound Group								•	•	
Kadeton Audio Co., Ltd.				•	•			•	•	
Kwanasia Electronics Co., Ltd.	•	•	•	•			•			
OBE Pro Audio Co., Ltd.										•
Ocean Sound Technology, Ltd.								•	•	
Shenzhen Tekzone Loudspeaker Co., Ltd.								•	•	
Sound Technology Development, Ltd.								•	•	
Sun Technique Electric Co., Ltd.								•	•	
Zhuhai HiVi Technology Co., Ltd.								•	•	

46 2015 Loudspeaker Industry Sourcebook

ENCLOSURES & CABINETS

	Baffles		Finished Cabinets		Bulk Molding Compound		Sub-Assemblies					Materials		Panels		Rigging	
	Ceiling Speaker Plates	In-Wall Plates	Box Arrays (PA)	Boxes	Stands	Compound	Carpet	Hardwood	MDF (Fiberboard)	Paper/Paper Pulp	Other	Plastic	Plywood	Veneer	Wound Geometric Tubes		
UKRAINE																	
MAG				•												•	
Magnet, Ltd.				•	•												
UNITED KINGDOM																	
Bishopsound				•	•	•											
Fane International																•	•
OHM (UK), Ltd.				•													
Hill Acoustics, Ltd.					•												
Revolver Audio, Ltd.		•															
UNITED STATES																	
AcousTex Fabrics																•	
Advanced Transduction																•	•
American Bass USA		•	•	•	•	•											
AMS Audio Enterprises, Inc.		•	•		•	•											
Audia Media Group																•	•
Audiophiles Engineering					•												
Avtek International				•	•												
Bogen Communications, Inc.		•	•	•	•	•											
Cadillac Audio				•													•
Carvin Corp.				•												•	
CGN Audio Labs				•	•											•	



SUBSCRIBE to audioXpress today!

Speaker Design
Tubes
Driver Testing
Vintage Audio and More...

audioexpress.com

audioXpress



Strong - Dense - Inert Composite Solutions

Horns
Cabinets
Baffles
Phasing Plugs

You should hear what you're missing

GLOBE COMPOSITES, INC. - Chino, CA
800.806.6019 www.GlobeComposites.com

48 2015 Loudspeaker Industry Sourcebook

	Enclosure Stuffing	Grille Assemblies	Hardware						
	Enclosure Grilles	Fiberglass	Foam	Synthetic	Fabric Suppliers	Foam Suppliers	Perforated Metal Suppliers	Comers	Fasteners & Other
THAILAND									
Audiovista		•	•	•			•		
Clarasonic			•						
UKRAINE									
MAG								•	•
Magnet, Ltd.	•							•	
UNITED KINGDOM									
Bishopsound	•			•				•	•
EuroTec International, plc	•							•	
UNITED STATES									
AcousTex Fabrics						•			
Acoustics First Corp.		•	•			•	•		
Acoustone Corp.	•					•			
Advanced Transduction									•
American Bass USA	•							•	•
AMS Audio Enterprises, Inc.	•					•	•		•



AcousticsFirst[®].com

▲ Materials to Control Sound & Eliminate Noise.™





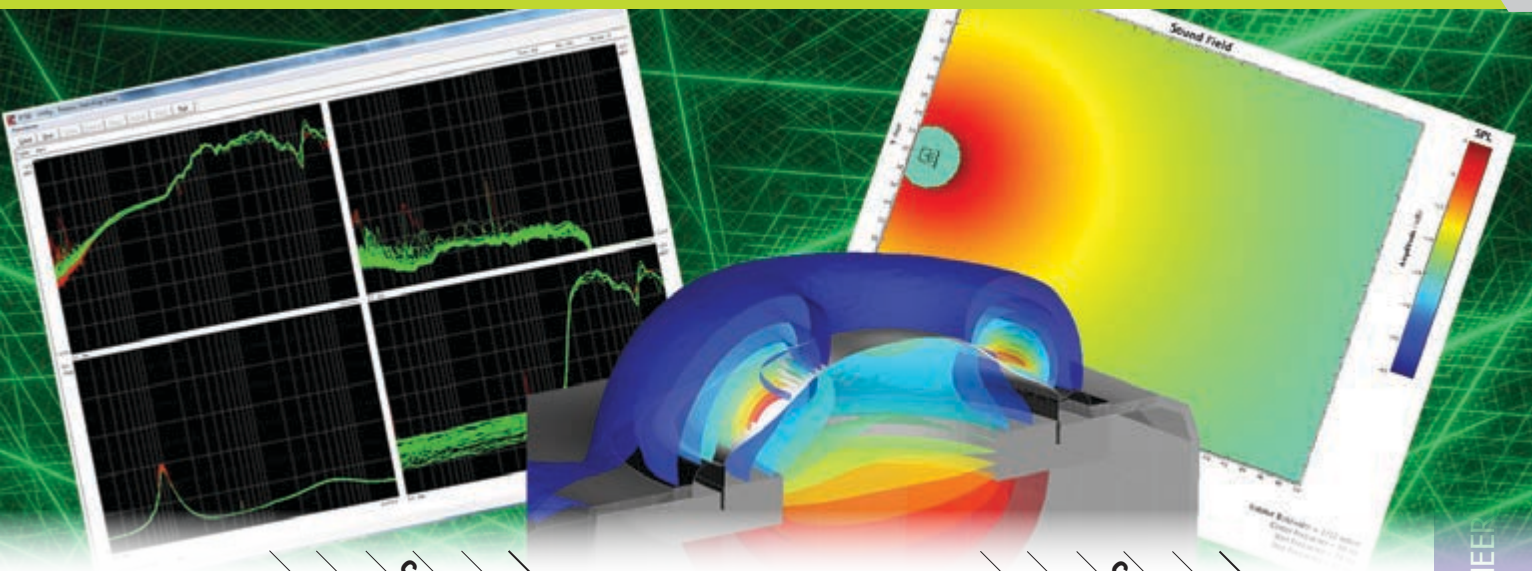
Photo by MMAA Labs

Acoustical Foam comes in many different shapes & sizes. Get the correct shape & size for your project.

- Custom Products
- Vibration Control
- Absorbers
- Diffusers
- Barriers

Toll-Free Number:

888-765-2900



	Acoustic Analysis	Crossover Design	Box Design	Network Optimizer	CAE or CAD
AUSTRALIA					
Audiosoft		•		•	•
DEQX Pty., Ltd.	•			•	
Stones Sound Studio	•	•	•		•
BRAZIL					
Advanced Audio Technologies		•		•	•
Decibel Eng. Ind.	•	•	•	•	•
CANADA					
Audio-Concept (G.C.)	•	•	•	•	•
Canadian Speaker Works	•	•			•
Peter Duminy - Loudspeaker Research & Design (DLC)	•	•	•	•	
Raw Acoustics	•	•	•	•	
Solen Electronique, Inc.	•	•	•	•	
Warkwyn Associates, Inc.	•				
CHINA					
BSWA Technology Co., Ltd.	•				
Eastern Asia Technology (HK) Ltd.					
-Premier Sound Group	•	•	•	•	•
Fujikon Industries Co., Ltd.	•				
Kadeton Audio Co., Ltd.		•			
Ocean Sound Technology, Ltd.	•	•	•	•	•
Shenzhen Tekzone Loudspeaker Co., Ltd.	•	•	•	•	•
Sound Technology Development, Ltd.	•	•	•	•	•
Sun Technique Electric Co., Ltd.	•	•	•	•	•
Zhuhai HiVi Technology Co., Ltd.	•	•	•		•
DENMARK					
LOUDSOFT, Ltd.	•	•	•	•	•
SIEA	•	•	•	•	•
FRANCE					
Kyu Systems	•		•	•	•

	Acoustic Analysis	Crossover Design	Box Design	Network Optimizer	CAE or CAD
GERMANY					
Akustik Perfekt	•	•	•	•	•
Audiophil GmbH	•	•	•	•	•
Physical Lab	•	•	•	•	•
R&D Team Software Development	•				
Sounds-Good Audio Solutions	•	•	•		•
Wolf von Langa		•		•	•
GREECE					
WiSound	•				
INDIA					
GM Audio Technics, Ltd.	•	•	•		
Innova Engineering, Inc.			•		
S.S. Electronics	•	•	•	•	
Trent Engineering		•			
ISRAEL					
Chorus Audio Group	•	•	•		
Coby Speakers	•	•	•	•	•
ITALY					
Audiomatica, S.R.L.	•				
Axiomedia		•	•		
ELP Corp.		•	•		
Professional Audio, SNC	•	•	•	•	•
SpeakerLAB, S.R.L.	•	•			•
JAPAN					
ETANI Electronics Co., Ltd.	•	•			•
LATVIA					
Acoustic Power Lab	•		•		
MALAYSIA					
Audio Labs	•	•	•	•	•

	Acoustic Analysis	Crossover Optimizer Box Design	Network Optimizer	CAE or CAD
NETHERLANDS				
Auvio Netherlands, BV			•	
Bget			•	
KBL Systems	•	•	•	•
Millon Loudspeakers	•	•	•	•
SPOORT.NU	•	•	•	•
the BEE	•	•	•	
NORWAY				
Midgard Audio	•	•	•	•
POLAND				
Soniclab	•	•	•	•
SPAIN				
Woods Engineering	•			
SWEDEN				
Audio Pro, AB	•	•	•	•
Böhrmer Audio, AB	•			
Green Acoustics	•			

	Acoustic Analysis	Crossover Optimizer Box Design	Network Optimizer	CAE or CAD
THAILAND				
Audiovista	•	•	•	•
Clarasonic	•			•
SAE	•			
UKRAINE				
MAG	•	•	•	•
UNITED KINGDOM				
Bishopsound		•	•	•
Fane International	•	•	•	•
PACSYS, Ltd.	•	•		
Precision Devices, Ltd.	•	•	•	•
UNITED STATES				
Advanced Transduction	•			•
Aempyrean, Inc.	•			
American Bass USA	•	•	•	•
Audia Media Group	•	•	•	•
Audio Precision	•			
Audiophiles Engineering	•	•	•	•

EMPOWER THE MUSIC

**Read.
Design.
Build.
ENJOY!**

With this how-to loudspeaker book, you will be able to crank up the volume on a first-rate system that you designed and built yourself.



cc-webshop.com

	Acoustic Analysis	Crossover Design	Box Design	Network Optimizer	CAE or CAD
Avtek International	•	•	•	•	•
Brüel & Kjær Sound & Vibration Measurement A/S	•				
Citadel (Bulk Molding Compounds, Inc.)					•
Crystal Acoustics		•			
Danville Signal Processing, Inc.				•	
Dayton Audio	•	•			
eImagineFactory, LLC					•
Eminence Speaker, LLC		•			
Excelsior Audio	•				
Fantazy Motorsports	•	•	•	•	•
Globe Audio Design, Inc.				•	•
Global Audio Source, Inc.				•	•
Grund Audio Design	•	•	•	•	•
Hisco Precision Converting, Inc.					•
Listen Audio Systems, Inc.	•	•	•	•	
Listen, Inc.	•				
Martin Sound Products		•			
Meniscus Audio Group, Inc.	•				

	Acoustic Analysis	Crossover Design	Box Design	Network Optimizer	CAE or CAD
MSC Software	•				•
NMA Acoustics		•		•	•
New Millennium Acoustics	•	•	•	•	•
North Reading Engineering	•			•	
Pazandeh Audio Designs		•		•	
Parts Express	•	•	•		
Peavey Electronics					•
Pioneer Hill Software	•				
Pro Sound Testing, Inc.	•				
Psychoacoustics	•	•	•		
RBH Sound	•	•	•	•	•
Scantek, Inc.	•				
Smith and Larson Audio	•	•	•	•	
SoundKinetics, Inc.	•				
Speaker Art					•
Speaker Clinic	•	•	•	•	•
True Technologies, Inc.	•	•			

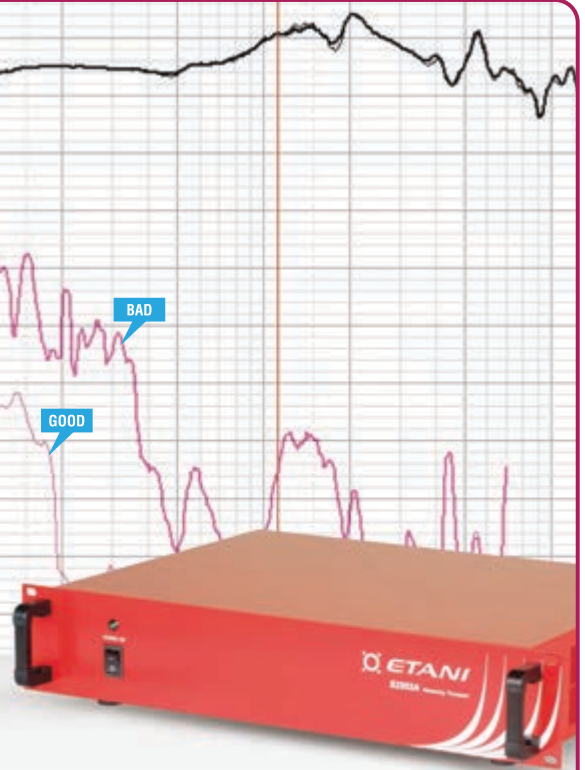
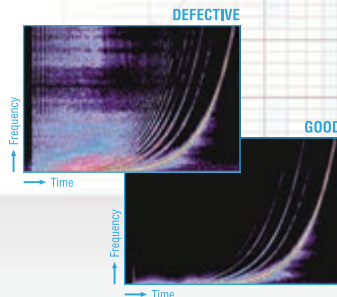
ETANI

Have you
"seen"
Rub & Buzz?



Loudspeaker Test System **S-255**

The system has excellent performance covering all tests with high speed, e.g. 20 - 20 kHz / 1.5 sec.



ETANI ELECTRONICS CO., LTD.

1-10-15, Ohmori-Honcho, Ohta-Ku, Tokyo, 143-0011 Japan
Tel: +81-3-5763-1391 Fax: +81-3-5763-1394

www.etani.co.jp

FINISHED SYSTEMS (OEM/ODM) & INTEGRATED AUDIO



OEM/ODM
(Finished Systems)

Integrated Amplified
Speaker Solutions

	Home Audio Car Audio	Pro Audio	Amplifiers	Dsp (Digital Signal Processing)	Subwoofer Amplifier Modules	Soundbars	Wireless
AUSTRALIA							
DEQX Pty., Ltd.							
Lorantz Audio Services Pty., Ltd.							
Stones Sound Studio	•	•	•	•	•	•	•
BELGIUM							
Premium Sound Solutions	•	•	•	•	•	•	•
BRAZIL							
Advanced Audio Technologies	•	•	•	•	•	•	•
AMCP Electronics		•	•	•	•	•	•
Audiopax Audio Systems		•	•	•	•	•	•
Decibel Eng. Ind.	•	•	•	•	•	•	•
Harman do Brasil	•	•	•	•	•	•	•
CANADA							
Audio-Concept (G.C.)		•	•	•	•	•	•
Audio Opportunities, Ltd.		•	•	•	•	•	•
Canadian Speaker Works		•	•	•	•	•	•
Creative Sound Solutions		•	•	•	•	•	•
Kravchenko-Audio		•	•	•	•	•	•
LMH Loudspeakers		•	•	•	•	•	•
Peter Duminy - Loudspeaker Research & Design (DLC)		•	•	•	•	•	•
Planet_10 hi-fi		•	•	•	•	•	•
Raw Acoustics		•	•	•	•	•	•

2015 Loudspeaker Industry Sourcebook

FINISHED SYSTEMS (OEM/ODM) & INTEGRATED AUDIO

OEM/ODM (Finished Systems)	Integrated Amplified Speaker Solutions						
	Home Audio Car Audio	Pro Audio	Amplifiers	DSP (Digital Signal Processing)	Subwoofer Plate Amps	Soundbars	Wireless
Innova Engineering, Inc.		•					•
Iwai Electronics Pvt., Ltd.					•		
Power Electronics & Technologies		•	•	•	•		
S.S. Electronics			•	•	•		
Trent Engineering							•
Wizard India Private, Ltd.			•				
INDONESIA							
SB Acoustics/ Sinar Baja Electric	•	•	•				
ISRAEL							
Chorus Audio Group		•					
Coby Speakers	•	•	•	•	•	•	•
Morel, Ltd.	•	•			•		
ITALY							
Audiomarin, SNC		•	•		•		
Audioxplus, S.R.L.	•	•	•				
Axiomedia, S.R.L.				•	•	•	•
ELP Corp.		•	•				
FaitalPRO			•				
Outline, S.R.L.			•				
Professional Audio, SNC	•	•	•	•			
SpeakerLAB, S.R.L.		•	•				
JAPAN							
ETANI Electronics Co., Ltd.	•	•	•	•	•	•	
LATVIA							
Acoustic Power Lab					•		
MEXICO							
Aletheia AV		•					
NETHERLANDS							
Auvio Netherlands, BV		•	•	•	•	•	•
Bget			•	•	•	•	
KBL Systems			•	•	•	•	
Millon Loudspeakers		•					•
Sound Projects			•				
SPOORT.NU	•	•	•	•	•	•	•
tg-acoustics		•					
the BEE		•	•		•		•
NORWAY							
Midgard Audio		•		•	•	•	•
SEAS Fabrikker A/S		•		•	•	•	•
PHILIPPINES							
Dai-ichi Electronics Manufacturing Corp.	•	•	•				

FINISHED SYSTEMS (OEM/ODM) & INTEGRATED AUDIO

OEM/ODM (Finished Systems)	Integrated Amplified Speaker Solutions					
	Home Audio Car Audio	Pro Audio	Amplifiers	DSP (Digital Signal Processing)	High-Power Amplifier Modules	Subwoofer Plate Amps
POLAND						
Soniclab		•	•		•	•
Sveda Audio			•			
ROMANIA						
SC Poweraudio, S.R.L.			•			
SPAIN						
EQUIPSON, S.A.			•		•	
SWEDEN						
Anaview (ETAL Group)				•		
Audio Pro, AB	•	•	•		•	•
Böhmer Audio, AB	•	•	•		•	
Green Acoustics		•	•	•		

FEB 2015
Vance Dickason
11 Founders Plaza, Suite 900
East Hartford, CT 06108

RENEW
your subscription to
Voice Coil before
it expires!

Qualified subscriptions
run for one year. Check
your mailing label now to see
if you're ready to renew.

VOICE COIL

For more information call
860.289.0800
or visit **www.voicecoilmagazine.com**

TSG
SpeakersAndAmps.com
801-771-1820
jtsgaudio@gmail.com

Introducing TSG Plate Amps and Rack Amps
using Pascal Amp Modules and Marani cutting-edge DSP's.
with Ultra High SNR, Low THD, HIGH Damping Factor,
Wide Flat Frequency Response and Universal AC Mains.

Models from 300 Watts to 4000 Watts RMS
Multi-channel models with BTL mode

Applications for PRO PA Systems, Line Arrays,
Subwoofers, Commercial and Home Theater, Immersive
Audio, BlueTooth, Wireless and all kinds of audio systems!

If you need amplifiers, speakers, drivers, horns or
enclosures, we have the very best for you.

Design services and
customization
available.

Since 1977
Bringing you ALL the top-line Audio Manufacturers Worldwide!

EMINENCE
CRADIAN
fairol
RCF
HORN
CELESTION

FINISHED SYSTEMS (OEM/ODM) & INTEGRATED AUDIO

OEM/ODM (Finished Systems)	Integrated Amplified Speaker Solutions							
	Home Car Audio	Home Audio	Pro Audio	High-Power Amplifiers	DSP (Digital Signal Processing)	Subwoofer Soundbars	Plate Amps	Wireless
TAIWAN								
EuroTec International, Ltd.	•					•		
Huey Tung International Co., Ltd.	•	•	•					
Kmaxima Group	•	•	•				•	
THAILAND								
Audiovista	•	•			•	•		
Clarasonic	•	•						•
SAE	•	•	•					
UKRAINE								
MAG				•	•	•	•	•
Magnet, Ltd.				•				
UNITED KINGDOM								
Alacrity Audio		•	•					
Bishopsound			•	•	•	•		•
EuroTec International, plc	•					•		
Excel Audio Systems, Ltd.			•					
Fane International			•					
Hill Acoustics, Ltd.		•	•					
Precision Devices, Ltd.			•					
Revolver Audio, Ltd.		•		•				
Tectonic Elements, Ltd.				•		•		•
UKD, Ltd.		•		•				
UNITED STATES								
Acoustic Development International	•	•	•				•	
Advanced Transduction		•	•					•
Aempyrean, Inc.	•	•	•				•	
Alta Audio		•						
American Bass USA	•		•	•	•	•	•	•
AMS Audio Enterprises, Inc.		•	•	•				•
Anaview				•		•	•	•
Area52RnD		•	•	•	•	•		•
Audia Media Group	•	•	•	•	•	•		•
Audio Nirvana Speakers	•	•	•	•				
Audiofly, Pty., Ltd.			•					
Auratron Systems		•	•	•				
Avtek International		•	•	•	•	•	•	•
Bamberg Engineering		•						
BASSBOSS			•					
Bogen Communications, Inc.		•	•	•	•			
Carvin Corp.			•	•	•	•		•
CGN Audio Labs		•	•					
Citadel (Bulk Molding Compounds, Inc.)		•	•				•	

2015 Loudspeaker Industry Sourcebook

FINISHED SYSTEMS (OEM/ODM) & INTEGRATED AUDIO

	OEM/ODM (Finished Systems)		Integrated Amplified Speaker Solutions						
	Home Audio	Car Audio	DSP	High-Power Amplifier	DSP (Digital Signal Processing)	Subwoofer	Plate Amps	Wireless	
NSMT Loudspeakers									
Orb Audio, LLC									
ORCA Design and Manufacturing									
Pacific Transformer Corp.									
Parts Express									
Pazandeh Audio Designs									
Precision Transducer Engineering (PTE)									
Pro Sound Testing, Inc.									
Psychoacoustics									
PUI Audio, Inc.									
QSC Audio Products, LLC									
RBH Sound									
Renkus-Heinz, Inc.									
Rocking Class Electronics									
Role Audio									
RSL Speaker Systems									
Solidex Manufacturing Group, LLC									
Sound Lab, Inc.									
Speaker Art									
SpeakerAddict									
StanleyMarquiss.com									
Studio Electric									
Tone Tubby, Inc.									
Trax Audio									
True Technologies, Inc.									
TSG Audio									
TXR Custom Car Audio									
Tymphony									
Under Cover									
Vertek/XTC									
Westlake Audio									
Yorba Acoustics									

MANUFACTURING EQUIPMENT



	Adhesive Dispensers	Curing Ovens	Lead Out Wire Termination	Production Line Equipment	Magnetizers/Demagnetizers	Ultrasonic Assembly Equipment
AUSTRALIA						
Stones Sound Studio						•
BRAZIL						
Decibel Eng. Ind.	•		•	•	•	•
CANADA						
Canadian Speaker Works	•	•		•		•
Space-Tech Lab., Ltd.					•	
Studio Reference Monitors					•	
The Canadian Loudspeaker Corp.	•					
CHINA						
Eastern Asia Technology (HK) Ltd.						
-Premier Sound Group	•		•	•	•	•
OBE Pro Audio Co., Ltd.	•	•	•	•	•	•
Ocean Sound Technology, Ltd.	•	•	•	•	•	•
Sea Galleon International, Ltd.	•					
Shenzhen Tekzone Loudspeaker Co., Ltd.	•	•			•	•
Sound Technology Development, Ltd.	•	•	•	•	•	•
Sun Technique Electric Co., Ltd.	•	•	•	•	•	•
Zhuhai HiVi Technology Co., Ltd.	•	•			•	•
DENMARK						
LOUDSOFT, Ltd.					•	
GERMANY						
ATE (Audio Technology Engineering)						•
Wolf von Langa						•
INDIA						
Innova Engineering, Inc.	•	•	•			
S.S. Electronics	•		•			•
Trent Engineering			•		•	•
ISRAEL						
Chorus Audio Group	•			•		•
Coby Speakers		•	•	•	•	•
ITALY						
Professional Audio, SNC		•	•	•	•	•
SpeakerLAB, S.R.L.					•	
JAPAN						
ETANI Electronics Co., Ltd.					•	

	Adhesive Dispensers	Curing Ovens	Lead Out Wire Termination	Production Line Equipment	Magnetizers/Demagnetizers	Ultrasonic Assembly Equipment
NETHERLANDS						
KBL Systems	•				•	
Millon Loudspeakers	•				•	•
SPOORT.NU		•	•	•	•	•
the BEE					•	
POLAND						
Soniclab						•
SWEDEN						
Audio Pro, AB						•
SWITZERLAND						
Megatec, AG		•		•	•	•
THAILAND						
Audiovista					•	
Clarasonic			•		•	
UKRAINE						
MAG						•
UNITED KINGDOM						
Fane International	•	•	•	•	•	•
Hill Acoustics, Ltd.					•	
Precision Devices, Ltd.		•	•	•	•	•
UNITED STATES						
Acoustic Design, Inc.						•
American Bass USA	•	•		•	•	•
Audia Media Group	•		•		•	•
Brüel & Kjær Sound & Vibration Measurement A/S						•
Dynavox Electronics, Inc.						•
Fantasy Motorsports	•	•	•	•	•	•
Fluid Metering, Inc.	•					
Hernon Manufacturing, Inc.	•					
Hisco Precision Converting, Inc.	•				•	
Nordson EFD	•				•	
North Reading Engineering				•		•
The Eraser Company, Inc.					•	
True Technologies, Inc.					•	

MEASUREMENT MICROPHONES



AUSTRALIA

DEQX Pty., Ltd.
Stones Sound Studio

BRAZIL

Decibel Eng. Ind.
Harman do Brasil

CANADA

Audio-Concept (G.C.)
Canadian Speaker Works
Peter Duminy - Loudspeaker
Research & Design (DLC)
Solen Electronique, Inc.
Tortech Engineered Sound Products
Warkwyn Associates, Inc.

CHINA

BSWA Technology Co., Ltd.
Shenzhen Tekzone Loudspeaker Co., Ltd.
Sound Technology Development, Ltd.
Sun Technique Electric Co., Ltd.

DENMARK

LOUDSOFT, Ltd.

FRANCE

Kyu Systems

GERMANY

blue planet acoustic
iSEMcon GmbH
Physical Lab
Sounds-Good Audio Solutions

INDIA

GM Audio Technics, Ltd.
S.S. Electronics
Trent Engineering

ISRAEL

Chorus Audio Group

ITALY

Professional Audio, SNC
SpeakerLAB, S.R.L.

JAPAN

ETANI Electronics Co., Ltd.

NETHERLANDS

KBL Systems
SPOORT.NU
the BEE

PHILIPPINES

Dai-ichi Electronics Manufacturing Corp.

SPAIN

Woods Engineering

SWEDEN

Audio Pro, AB

THAILAND

Audiovista
SAE

UKRAINE

MAG

	Consumer	Field Mics	Lab Instruments	Measuring Mics	Professional
AUSTRALIA					
DEQX Pty., Ltd.		•			•
Stones Sound Studio	•	•	•	•	•
BRAZIL					
Decibel Eng. Ind.	•	•	•	•	•
Harman do Brasil	•	•	•	•	•
CANADA					
Audio-Concept (G.C.)				•	•
Canadian Speaker Works					•
Peter Duminy - Loudspeaker					•
Research & Design (DLC)				•	•
Solen Electronique, Inc.	•			•	•
Tortech Engineered Sound Products					•
Warkwyn Associates, Inc.				•	
CHINA					
BSWA Technology Co., Ltd.			•	•	•
Shenzhen Tekzone Loudspeaker Co., Ltd.				•	
Sound Technology Development, Ltd.					•
Sun Technique Electric Co., Ltd.	•	•	•	•	•
DENMARK					
LOUDSOFT, Ltd.				•	•
FRANCE					
Kyu Systems				•	•
GERMANY					
blue planet acoustic	•				•
iSEMcon GmbH					•
Physical Lab	•				•
Sounds-Good Audio Solutions					

	Consumer	Field Mics	Lab Instruments	Measuring Mics	Professional
INDIA					
GM Audio Technics, Ltd.					•
S.S. Electronics					•
Trent Engineering				•	
ISRAEL					
Chorus Audio Group					•
ITALY					
Professional Audio, SNC				•	•
SpeakerLAB, S.R.L.				•	•
JAPAN					
ETANI Electronics Co., Ltd.				•	•
NETHERLANDS					
KBL Systems				•	•
SPOORT.NU		•	•	•	•
the BEE		•		•	•
PHILIPPINES					
Dai-ichi Electronics Manufacturing Corp.					•
SPAIN					
Woods Engineering					•
SWEDEN					
Audio Pro, AB				•	•
THAILAND					
Audiovista				•	•
SAE					•
UKRAINE					
MAG					•

MEASUREMENT MICROPHONES

	Consumer	Lab Instruments Field Mics	Measuring Mics	Professional
UNITED KINGDOM				
Bishopsound	•			•
Fane International			•	•
Hill Acoustics, Ltd.				•
Precision Devices, Ltd.			•	•
UNITED STATES				
ACO Pacific, Inc.	•	•	•	•
Advanced Transduction			•	•
American Bass USA	•		•	•
Audio Media Group	•	•	•	•
Audio Precision			•	•
Audiofly, Pty., Ltd.	•			
Bogen Communications, Inc.				•
Brüel & Kjær Sound & Vibration Measurement A/S			•	•
Dayton Audio	•	•	•	•
Elkhorn Acoustics, LLC				•
Fantasy Motorsports	•	•	•	•
G.R.A.S. Sound & Vibration		•	•	•
Gingko Audio, Inc.				•

	Consumer	Lab Instruments Field Mics	Measuring Mics	Professional
JLI Electronics, Inc.	•	•	•	•
Listen, Inc.			•	•
New Millennium Acoustics	•		•	
North Reading Engineering	•	•	•	•
NTi Audio		•	•	•
Parts Express	•	•	•	•
PCB Piezotronics	•	•	•	•
Scantek, Inc.		•	•	•
Smith and Larson Audio			•	
True Technologies, Inc.			•	

www.pcb.com/acoustics

PCB PIEZOTRONICS™

Measurement Microphones

- Benchmarking of audio equipment and speakers
- Distortion and dynamic range verification
- Headphone and earbud testing
- Measurement of room acoustics

PCB® Microphones & Acoustic Products

High Quality • Fast Shipment • Unbeatable Prices • Best Warranty

www.pcb.com/acoustics ■ Toll Free in USA 800-828-8840 ■ E-mail info@pcb.com



MIC CAPSULES ALL TYPES

STOCK + CUSTOM

Mic Capsules
Housings + Mounts
Lead Attachment
Connectorizing
Waterproofing
Wind Screens
Circuitry
PCB Assembly
Testing

Mic Assemblies
For Any Purpose

Low Minimums

HOW MAY WE
HELP YOU?

JLI ELECTRONICS
215-256-3200

www.jlielectronics.com

	Dynamic	ECM	MEMs
AUSTRALIA Stones Sound Studio		•	
BRAZIL Decibel Eng. Ind.	•	•	•
CHINA BSWA Technology Co., Ltd. Shenzhen Tekzone Loudspeaker Co., Ltd. Sound Technology Development, Ltd. Sun Technique Electric Co., Ltd.		•	
FRANCE Kyu Systems		•	•
GERMANY Sounds-Good Audio Solutions		•	
INDIA S.S. Electronics Trent Engineering		•	•
JAPAN ETANI Electronics Co., Ltd.	•		
NETHERLANDS KBL Systems SPOORT.NU the BEE	•	•	•
SWEDEN Audio Pro, AB	•	•	
TAIWAN EuroTec International, Ltd.	•	•	
THAILAND Audiovista		•	•
UKRAINE MAG	•	•	•
UNITED KINGDOM Bishopsound EuroTec International, plc	•	•	
UNITED STATES ACO Pacific, Inc. Advanced Transduction Audia Media Group Fantazy Motorsports Globe Plastics, Inc. JLI Electronics, Inc. North Reading Engineering PUI Audio, Inc.	•	•	•



	Cell Phone	Tablet/MID	Laptop
AUSTRALIA Stones Sound Studio	•	•	•
BRAZIL Harman do Brasil	•	•	•
CANADA Solen Electronique, Inc.	•	•	•
CHINA AAC Technologies Holdings, Inc.	•	•	•
M-Sound Electronics Co., Ltd.			•
Ocean Sound Technology, Ltd.	•	•	•
Shenzhen Tekzone Loudspeaker Co., Ltd.		•	
Sound Technology Development, Ltd.	•	•	•
Sun Technique Electric Co., Ltd.	•	•	•
Zhejiang Innuovo Loudspeaker Co., Ltd. Hengdian Group		•	•
INDIA S.S. Electronics		•	
Trent Engineering		•	
ITALY Axiomedia		•	•
NETHERLANDS SPOORT.NU	•	•	•

	Cell Phone	Tablet/MID	Laptop
TAIWAN Huey Tung International Co., Ltd.		•	•
UNITED KINGDOM Hill Acoustics, Ltd.	•	•	•
UNITED STATES Acoustic Development International		•	•
BeStar Technologies, Inc.	•	•	•
Dayton Audio	•	•	•
Fantasy Motorsports	•	•	•
GGEAC America, Inc.	•	•	•
NedLab		•	
Parts Express	•	•	•
PUI Audio, Inc.	•	•	•
Solidex Manufacturing Group, LLC		•	
Sound Sources Technology, Inc.	•		



Finished Goods

Acoustic Materials

	Acoustic Materials	Finished Goods
NETHERLANDS		
Auvio Netherlands, BV		•
KBL Systems	•	•
Millon Loudspeakers	•	•
SPOORT.NU	•	•
tg-acoustics		•
the BEE	•	•
NORWAY		
Midgard Audio	•	•
SEAS Fabrikker A/S		•
POLAND		
Sveda Audio		•
ROMANIA		
SC Poweraudio, S.R.L.		•
SWEDEN		
Audio Pro, AB	•	•
Böhmer Audio, AB	•	
TAIWAN		
Bennic Components		•
EuroTec International, Ltd.	•	•
Huey Tung International Co., Ltd.	•	•
Kmaxima Group	•	
TB Speaker Co., Ltd.		•
THAILAND		
Audiovista	•	•
Clarasonic	•	•
Grand Inter Products		•
SAE	•	
UKRAINE		
MAG	•	•
UNITED KINGDOM		
Bishopsound	•	•
EuroTec International, plc	•	•
Fane International		•
Hush Audio		•
Precision Devices, Ltd.		•
Revolver Audio, Ltd.		•
Tectonic Elements, Ltd.		•
Volt Loudspeakers, Ltd.		•
UNITED STATES		
AcousTex Fabrics	•	•
Acoustic Development International		•
Acoustics First Corp.	•	
Acoustone Corp.	•	
Advanced Transduction		•
Aempyrean, Inc.		•
American Bass USA	•	•
AMK Speaker		•
AMS Audio Enterprises, Inc.		•
Area52RnD		•

	Acoustic Materials	Finished Goods
Atlas Sound		•
Audia Media Group	•	•
Audio Nirvana Speakers		•
Avtek International		•
B&C Speakers, S.p.A.		•
Bamberg Engineering		•
BeStar Technologies, Inc.		•
Bogen Communications, Inc.		•
Carvin Corp.		•
CGN Audio Labs		•
Citadel (Bulk Molding Compounds, Inc.)	•	
Crystal Acoustics	•	•
Dayton Audio		•
DC Audio		•
Dynavox Electronics, Inc.		•
Eastern Asia Technology (HK), Ltd.		•
Electro Mavin		•
Eminence Speaker, LLC		•
ESS Labs, LLC		•
Faital, S.p.A.	•	
Fantasy Motorsports	•	•
Geometric Consulting		•
GGEC America, Inc.		•
Globe Audio Design, Inc.		•
Globe Plastics	•	
Grund Audio Design		•
JBL Selenium		•
Kinetic Audio International, Ltd.		•
Lamart Corp.	•	
Linn Audio Loudspeakers		•
Listen Audio Systems, Inc.	•	•
Lowell Manufacturing Co.		•
MISCO		•
NedLab	•	
New Millennium Acoustics	•	•
North Reading Engineering	•	•
NSMT Loudspeakers		•
Orb Audio, LLC		•
Parts Express	•	•
RBH Sound		•
Solidex Manufacturing Group, LLC		•
Solvay	•	
Sonic Craft, Inc.	•	
Sound & Lighting Systems		•
Sound Sources Technology, Inc.		•
Speaker Art		•
StanleyMarquiss.com		•
Studio Electric		•
TitanAudio, Ltd.		•
Tone Tubby, Inc.		•
Transducer Lab		•
Trax Audio		•
TSG Audio		•
Tymphany	•	•
Vertek/XTC	•	•



18

**EIGHTEEN
SOUND**

PROFESSIONAL
LOUDSPEAKERS



precision
hand-made
Italian loudspeakers

MADE IN ITALY



www.eighteensound.com

OEM SPEAKERS & DRIVERS

	Compression Drivers		Full Range		Midrange		Paging		Tweeters		Woofers	
	Electrostatic				Horns	Cone	Electrostatic	Planar	Siren/Voice Warning	Planar	Cone	Electrostatic
						Dome	Ribbon		Piezo			Ribbon
CHINA												
Audiostar Electronics Co., Ltd.												
B.W. Audio Guangzhou Co., Ltd.												
BSWA Technology Co., Ltd.												
Eastern Asia Technology (HK) Ltd.												
-Premier Sound Group												
Fountek Electronics Co., Ltd.												
M-Sound Electronics Co., Ltd.												
OBE Pro Audio Co., Ltd.												
Ocean Sound Technology, Ltd.												
Shenzhen Tekzone Loudspeaker Co., Ltd.												
Sound Technology Development, Ltd.												
Sun Technique Electric Co., Ltd.												
Trueanalog Strictly OEM Drivers												



wavecor
Loudspeaker Transducers

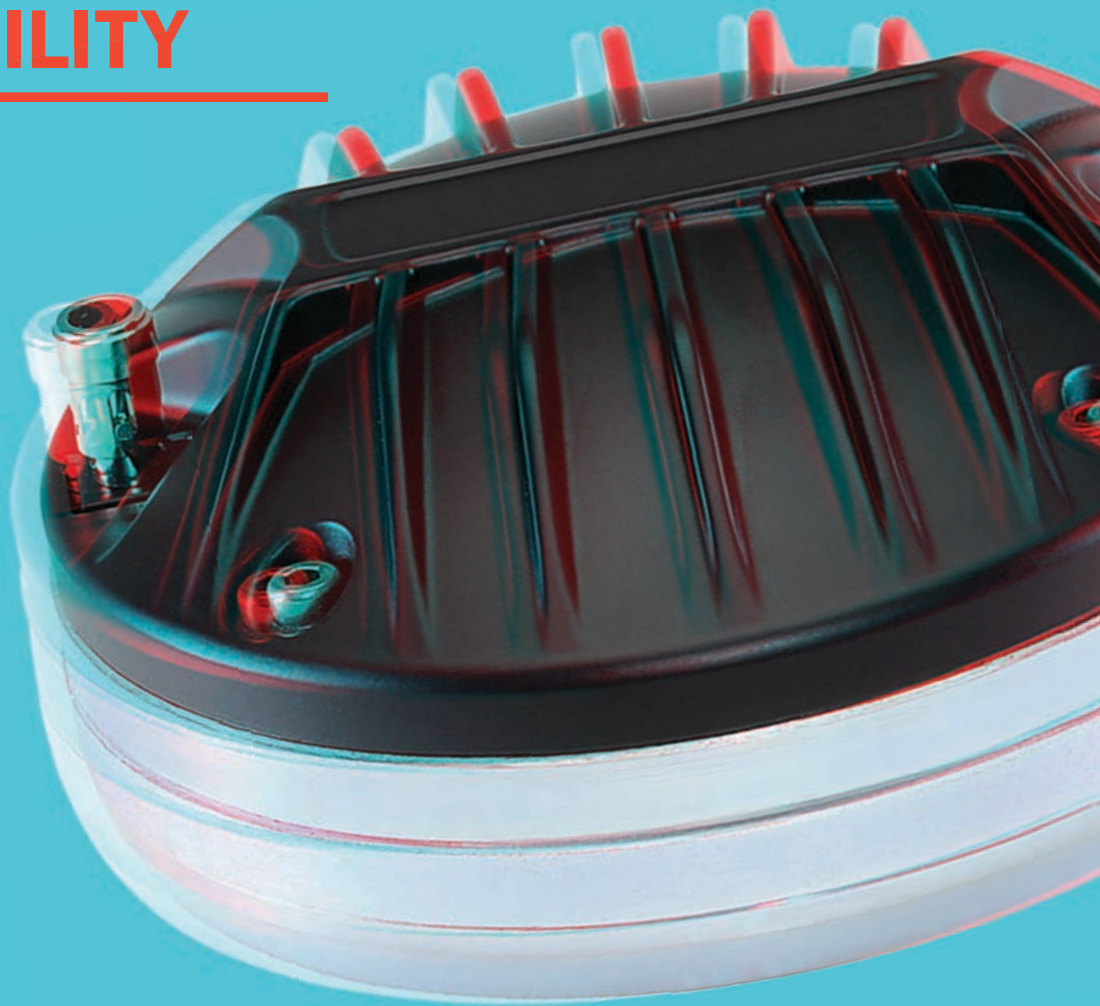
New OEM line of Transducers for large scale manufacturing.

Real Wavecor sound, specifications and consistency at very competitive prices.

www.WAVECOR.com

DE880TN

ADVANCED RELIABILITY



The compact, neodymium **DE880TN** features a robust titanium diaphragm that incorporates next generation surround geometry, and a brand new, optimized phase plug. Significant research has yielded a new coil former that solidifies the diaphragm with negligible increase in mass. The result is significantly improved high frequency linearity and reduced distortion.

As a leader in our complete range of 3" and 4" voice coil high frequency drivers, the **DE880TN** is an excellent 1.4" exit solution for two way point source enclosures, or for use on a wave guide, for multi-driver line array systems.



B&C SPEAKERS spa
via Poggiomoro 1, località Vallina
50012 Bagno a Ripoli (Firenze) - IT
tel. +39 055 65721
fax +39 055 6572312
mail@bcspeakers.com

made in Italy

www.bcspeakers.com

OEM SPEAKERS & DRIVERS

	Compression Drivers	Full Range	Midrange	Horns	Cone	Dome	Electrostatic	Planar	Paging	Ribbon	Siren/Voice	Tweeters	Planar	Piezo	Cone	Dome	Electrostatic	Ribbon	Woofers
Wavecor, Ltd.				•	•	•	•									•	•		•
Zhuhai HiVi Technology Co., Ltd.				•			•										•		•
DENMARK																			
Hiquphon																	•		
LOUDSOFT, Ltd.		•																	
Scan-Speak A/S				•		•	•										•		•
FRANCE																			
AUDAX			•	•	•	•	•									•	•		•
Kyu Systems			•	•	•	•			•				•			•	•		•
GERMANY																			
Akustik Perfekt					•	•												•	•
BMS Speakers GmbH		•	•	•	•	•							•	•					•
Wolf von Langa		•	•		•	•									•				•



Discover Morel's new **INTEGRA** driver line

Excellent directivity, high power handling, natural sounding performance. A great solution for Atmos - compatible speaker design. Available in 4,5,6" sizes.

DESIGNED FOR MORE

SENSITIVITY

POWER HANDLING

AFFORDABILITY

We used our decades of award-winning design and manufacturing expertise to create a line of professional transducers that delivers superior sound – for a lot less. Our column transducers feature a compact, wide bandwidth design with FEA-optimized geometry and our patented Penta Cut cone technology for better frequency response. Each component has been thoughtfully engineered to withstand the rigors of professional applications.



See all of our TC-Series full range and professional transducers at Tymphany.com/TC.

TC-SERIES
2.5" FULL RANGE

OEM SPEAKERS & DRIVERS

	Compression Drivers	Full Range	Midrange	Horns	Cone	Dome	Electrostatic	Planar	Paging	Ribbon	Siren/Voice	Tweeters	Planar	Piezo	Cone	Dome	Electrostatic	Ribbon	Woofers
INDIA																			
GM Audio Technics, Ltd.		•		•	•														•
Innova Engineering, Inc.						•													•
S.S. Electronics				•	•														•
Trent Engineering				•	•											•			•
Vidyut Teletronics, Ltd.					•											•			•
Wizard India Private, Ltd.		•	•	•	•	•										•	•		•
INDONESIA																			
SB Acoustics/Sinar Baja Electric		•	•	•	•	•			•	•									•
ISRAEL																			
Chorus Audio Group					•											•	•		•
Coby Speakers		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Morel, Ltd.			•	•	•	•										•			•
ITALY																			
Audioxplus, S.R.L.		•	•		•	•										•	•		•



THE ITALIAN EDGE
FOR SOUND TECHNOLOGY

OUR TECHNOLOGY
AT YOUR SERVICE

WWW.FAITALPRO.COM

High quality speaker driver Manufacturer



FOUNTEK

Fountek Electronics Co., Ltd.

<http://www.fountek.net>

E-mail: info@fountek.net

Tel: +86-573-83019220 Fax: +86-573-83019221



OEM SPEAKERS & DRIVERS

	Compression Drivers	Full Range	Midrange	Horns	Cone	Dome	Electrostatic	Planar	Ribbon	Paging	Siren/Voice	Tweeters	Planar	Piezo	Cone	Dome	Electrostatic	Ribbon	Woofers
Axiomedia		•	•	•	•	•			•		•	•	•		•	•		•	•
B&C Speakers, S.p.A.		•	•	•															
Eighteen Sound		•	•	•	•										•		•		•
ELP Corp.					•	•										•	•		•
Professional Audio, SNC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
NETHERLANDS																			
KBL Systems		•	•	•	•	•			•							•	•		•
Millon Loudspeakers					•											•			•
SPOORT.NU	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
the BEE		•	•	•	•	•										•	•		•
NORWAY																			
Midgard Audio		•	•		•	•	•	•	•			•				•	•		•
SEAS Fabrikker A/S			•			•										•			•
PHILIPPINES																			
Dai-ichi Electronics Manufacturing Corp.		•	•	•															•



Compact Soft Dome Tweeters
Custom-fit flange system



Small-size fullrange components
High performance drivers



Long Throw Subwoofers
High output in small volumes

Thinking
New
Opportunities

Your global partner
for transducers:
from concept to delivery



WWW.LAVOCESPEAKERS.COM

Lavoce
I T A L I A N A



Our People Make a Sound Difference



EASTERN ASIA TECHNOLOGY (HK) LIMITED

Premier Sound Group

PARTNERSHIP | WE HEAR YOU

Locally based client partner teams who work “your” hours and a world-wide engineering network with a passion for audio.

SCALE | WE SELL SOUND

Our complete vertical integration has been maximizing efficiencies and controlling costs for the major brands for 40 years.

TECHNOLOGY | OUR SCIENCE IS AUDIBLE

Advanced design in Transducers, Integrated Systems, Electronics, and Headphones.

www.kyetek.com/en-us

psginfo@kyetek.com

OEM SPEAKERS & DRIVERS

	Compression Drivers		Midrange				Paging Drivers		Siren/Voice Warning			Tweeters		Woofers		
	Electrostatic	Full Range	Horns	Cone	Dome	Electrostatic	Planar	Ribbon	Piezo	Planar	Warning	Cone	Dome	Electrostatic	Ribbon	
SPAIN																
Acustica Beyma, S.L.		•	•	•	•	•		•			•		•		•	
SWEDEN																
Audio Pro, AB	•	•	•		•	•		•	•		•	•			•	
TAIWAN																
BESTON Technology Corp.			•					•	•		•				•	
EuroTec International, Ltd.		•	•	•	•	•				•	•	•	•		•	
Huey Tung International Co., Ltd.		•	•	•	•	•	•			•			•	•	•	
Kmaxima Group		•														
TB Speaker Co., Ltd.		•	•	•		•		•								
THAILAND																
Audiovista			•		•	•							•		•	
Clarasonic			•		•	•									•	
Grand Inter Products			•	•		•						•	•		•	
SAE		•	•	•	•	•							•			

TEAMWORK | TECHNOLOGY | INVENTION | LISTEN | HEAR

BeStar
ACOUSTICS & SENSORS



**Loudspeakers
Microphones
Drivers**

*Global Audio Components supplier
to OEMs worldwide.*

*Largest selection off-the-shelf
micro-speaker designs for hand held devices.*

*Complete ODM Service,
extensive in-house audio engineering capabilities,
including anechoic chamber.*

BeStar® Technologies Inc., N.A.

Tel: 520-439-9204 Fax: 520-439-9214

email: sales@bestartech.com

www.bestartech.com

VOLT
LOUDSPEAKERS



ACCURATE
LOW POWER COMPRESSION
HIGH RELIABILITY
POWERFUL

www.voltloudspeakers.com



Designed & built in England



[voltloudspeakers](https://www.facebook.com/voltloudspeakers)



@VoltLoudspeaker

German **Automotive** & **HiFi** competence



Since its foundation in 1983, the LPG has established itself as a renowned German producer of loudspeakers and speaker systems.

Developmental headquarters and production are situated in Neu-Ulm, Bavaria. Highly modernized production techniques, automated construction cycles and severe quality control mechanisms make the LPG a solid and consistent OEM manufacturer.



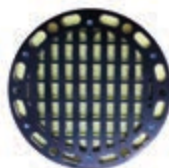
www.lpgmbh.com

OEM SPEAKERS & DRIVERS

	Compression Drivers		Full Range		Midrange		Paging Horns		Siren/Voice Warning		Tweeters		Woofers			
	Electrostatic			Horns	Cone	Dome	Electrostatic	Planar	Ribbon	Piezo	Planar	Warning	Cone	Dome	Electrostatic	Ribbon
UKRAINE																
MAG		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Magnet, Ltd.			•		•											•
UNITED KINGDOM																
Bishopsound			•	•	•	•				•	•			•	•	•
Celestion (UK Head Office)			•	•	•	•										•
EuroTec International, plc			•	•	•	•	•			•	•		•	•		•
Fane International			•	•	•	•	•	•						•	•	•
Hill Acoustics, Ltd.			•	•	•	•	•		•	•				•	•	•
Precision Devices, Ltd.			•	•	•	•	•							•	•	•
Tectonic Elements, Ltd.				•												
Volt Loudspeakers, Ltd.				•		•	•									•
UNITED STATES																
Acoustic Design, Inc.		•			•		•									



We Offer Ribbon Drivers for PA, Hi-Fi and Headphones



BESTON Technology Corporation

Address: 5F-13, No. 9, Ai Kuo West Rd., Taipei 100, Taiwan

TEL: (886)-2-23892956 FAX: (886)-2-23892952

E-Mail: s272@ms45.hinet.net

http://www.ribbonspeaker.com.tw

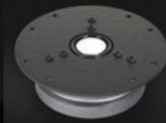
Transducer Lab

Precision Loudspeaker Engineering

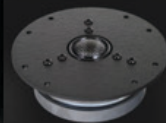
Offering the following Transducers



N28BER - Made with an Ultra High Purity (99.4%) Beryllium Dome and a high flux magnet design, this model offers exceptional resolution and dynamics up to 95db SPL. The peak to peak linear excursion is 1.2mm.



N26CR2 - With its Aluminum Oxide (pure ceramic) dome design and a unique 3 layer high damping surround, this model offers a smooth wide band frequency response and a dynamic 1mm peak to peak linear excursion.



N26CFR - Constructed from a high modulus Carbon Fiber fabric, this model has good internal damping while operating in a piston motion over the audible range. The 1mm peak to peak linear excursion ensures great dynamics.



N26MGR - Comprised of a Magnesium Oxide sandwich dome and high flux magnet structure. The lightweight dome allows a 94db SPL level and a quick and clean sound with a 1mm peak to peak linear excursion.

Visit our website to see the full lineup

www.TransducerLab.com



THE PRECISION DNA

The next generation has arrived... Providing the finest hi-fi performance, clarity of imaging, intelligibility at high SPL and coherence throughout the audio spectrum.

Whether it's a bespoke OEM design or a catalogue model each product remains to the PD design DNA; **Quality, craftsmanship and unrivalled performance.**

Contact us for an audition today.



PD.155TXN01 | COMING SOON...



PRECISION DEVICES
MADE IN ENGLAND

DISCOVER MORE ONLINE...



FIND US ON FACEBOOK/PrecisionDevices



FOLLOW US ON TWITTER @PrecDevices

WWW.PRECISION-DEVICES.COM

KMAXIMA

Innovate Create Value

World-class Supplier

ISO 9001 QMS
ISO 14001 EMS
ISO/TS 16949 QMS

European
logistic
function

ERP
Supported

New surface
treatment
Decoflex process

New robot
system
application

European water
based painting
system

Quality
Control
System

KMAXIMA GROUP

15-21, 3Rd. Neighborhood,
Belgang, Dayuan,
Taoyuan 33753, TAIWAN
TEL: +886-3-385-6570, EXT.209
FAX: +886-3-385-2767

KMAXIMA Technik GmbH

Kruppstr. 100, D-45145 Essen, Germany
Phone: +49 201/ 29 39 58 67
Fax: +49 201/ 29 39 58 66
www.kmaxima.de
E-mail: business@kmaxima.com

TOP 1000

SMEs
OF TAIWAN
2014



OEM SPEAKERS & DRIVERS

	Compression Drivers	Full Range	Horns	Cone	Dome	Electrostatic	Planar	Ribbon	Paging Horns	Siren	Voice	Warning	Cone	Dome	Electrostatic	Ribbon	Woofers
Acoustic Development International		•	•		•	•			•					•	•		•
Advanced Transduction														•			•
Aempyrean, Inc.			•					•				•					•
American Bass USA	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•
AMK Speaker		•	•														
AMS Audio Enterprises, Inc.		•	•	•	•	•								•	•		•
AntiCable Audio Co., Inc.																	
Audio Media Group	•	•	•		•		•	•	•	•		•	•	•		•	•
Audio Nirvana Speakers			•														
Avtek International		•	•		•	•		•	•	•		•	•	•		•	•
B&C Speakers, S.p.A.		•	•	•	•	•								•	•		•
BeStar Technologies Inc.			•		•	•					•	•	•	•	•		•
Bogen Communications, Inc.			•	•						•		•					
Carvin Corp.		•	•	•	•												•
Celestion (US Sales Office)		•	•	•	•								•	•			•

LA PASSION DU HAUT-PARLEUR

AUDAX

HAUT-PARLEUR - LOUDSPEAKER - LAUTSPRECHER

TW034X0

PR170M0



Dome tweeters, Midranges, Woofers

- Tweeter Line : 1" - 1 1/4", Soft and Metal Domes, ...
- Prestige Series : Die Cast Chassis, HDA Cones ...
- References Series : Die Cast Chassis, Paper and Carbon Cones, ...
- Classic Series : Stamped Steel Chassis, Paper, Fiberglass, Kevlar Cones, ...
- Professional Line : High Efficiency, High Power Handling, ...

High Quality Loudspeakers - Made in France

AUDAX

ZI Chemin de la Poterie 72340 LA CHARTRE SUR LE LOIR FRANCE - Tel. +33 (0) 2 43 79 03 60 - Fax +33 (0) 2 43 79 20 91

www.audax.com - lis@audax.com

A superior HF solution for your entire cabinet family

A comprehensive range of Celestion CDX 1" exit compression drivers provides system builders with optimised high frequency performance for projects of every scale and budget.

Find out more about Celestion professional loudspeakers and compression drivers at celestion.com.

Celestion CDX Series Compression Drivers



Find out more



www.celestion.com

CELESTION

TAKE IT ONE STEP FURTHER

Drive High-End projects to the high performance level you want with value and turnkey solutions from MISCO.

HIGH PERFORMANCE

Reach your critical Performance and Business Goals without spending a fortune on development.

TURNKEY SOLUTIONS

MISCO Loudspeakers, Amplifiers, Finished Goods. Our production will fit your production.



VALUE

We engineer and manufacture in the USA so you improve communications and cost efficiencies.



MISCO's New High Performance Sub-woofers and Mid-woofers

Start with our new Low Reluctance Return Path (LRRP) and Multiple Magnetic Air Gap (M-MAG), multi-patented loudspeaker technology with 8mm linear excursion, high sensitivity and low distortion. Add US-based engineers for expert collaboration. Put it all together with domestic production that saves time, cost, and hassle. That's how MISCO takes high-end OEMs, like you, one step beyond expectations.

RELEASING FALL 2015.

FOR PROFESSIONAL AUDIO SOLUTIONS, YOUR SOUND BEGINS WITH MISCO.

MISCO
For The Sound You Want

1-800-276-9955 | info@miscospeakers.com | www.miscospeakers.com

OEM SPEAKERS & DRIVERS

	Compression Drivers	Full Range	Horns	Core	Dome	Electrostatic	Planar	Paging	Horns	Piezo	Planar	Siren/Voice Warning	Cone	Dome	Electrostatic	Ribbon	Woofers
CGN Audio Labs		•	•	•				•	•	•							•
Citadel (Bulk Molding Compounds, Inc.)				•						•			•				•
Crystal Acoustics		•															
Dayton Audio		•	•	•	•	•		•	•	•	•	•	•	•			•
dB Design		•		•													
DC Audio																	•
Dynavox Electronics, Inc.		•	•	•		•		•	•	•	•						•
Electro Mavin					•	•								•			•
Eminence Speaker, LLC		•	•	•	•	•								•	•		•
ESS Labs, LLC			•		•				•							•	•
Faital, S.p.A.		•	•	•	•	•											•
Fisher Radio Corp.				•										•			
GSEC America, Inc.		•	•	•													
Gingko Audio, Inc.			•		•									•		•	•
Globe Audio Design, Inc.	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•

RECKHORN

The best one-point-source driver for your next high end speaker.

Fair royalty and technical assistance for small and large factories.
www.reckhorn.net email to Mr. Klaus Reck: rh@reckhorn.com



Two new tweeters from

Creative Sound Solutions



- LD22C has a proprietary compound curve faceplate for better off-axis response
- LD22F has a flatter faceplate, affording a stronger response in the midrange

www.creativesound.ca
604-504-3954

Made in Canada. Custom OEM available.



**THE PERFORMANCE
IS EVERYTHING.**

Fane audio components represent the ultimate in advanced design technology, optimum performance and outstanding durability. Our passion is to deliver transducers that utilise the finest components and materials to deliver supreme sonic performance.

Flexible to OEM needs, contact our engineering team to deliver your design brief today:

info@fane-international.com

WWW.FANE-INTERNATIONAL.COM



FIND US ON FACEBOOK/FANEGB



FOLLOW US ON TWITTER @FaneUK



OEM SPEAKERS & DRIVERS

	Compression Drivers	Full Range	Horns	Core	Donut	Electrostatic	Planar	Ribbon	Paging Horns	Siren/Voice Warning	Piezo	Planar	Core	Donut	Electrostatic	Ribbon	Woofers
Globe Plastics, Inc.		•		•							•						
Grund Audio Design		•	•	•													•
Hartley Loudspeakers, Inc.			•		•										•	•	•
JBL Selenium		•		•						•							•
Kinetic Audio International, Ltd.			•		•										•		•
Linn Audio Loudspeakers		•	•	•													•
Listen Audio Systems, Inc.			•		•										•		•
Loudspeakers Plus		•	•	•	•										•		•
Lowther Speakers USA			•														•
Martin Sound Products		•	•	•	•					•	•			•	•		•
Meniscus Audio Group, Inc.			•		•	•		•						•	•	•	•
MISCO		•	•		•						•		•	•	•		•
Motus Audio					•										•		•
NedLab			•		•	•								•	•		•

OBERTON®
Professional Loudspeakers

25 Years High Quality European Loudspeakers

www.oberton.com

EuroTec
INTERNATIONAL PLC

EuroTec is a cutting edge company, with more than 35 years' experience in loudspeakers, automotive and industrial, R & D and supply for European and Worldwide companies at OEM levels.

Whatever your requirements we provide: manufacture, applications, process, assembly and advice on performance and reliability of product from our TS16949 production facility.

We deliver competitive products worldwide.

Taiwan Sales Office: Taipei World Trade Centre:
4E24, No 5, Sec 5, Hsin Yi Rd, Taipei 110, Taiwan R.O.C.
Tel: +886 (0) 2 2725 1014 Fax: +886 (0) 2 2723 9995 Email: asia@etplc.com

Enquiries to Engineering/Sales at: UK office: +44 (0) 1420 538 500,
Email: info@etplc.com, www.etplc.com
Eurohm Works, Petersfield Road, Greatham, Hants, GU33 6AA

The image displays three books related to guitar amplifiers. The top book, 'Electric Guitar Amplifier Handbook' by Jack Durr, features a cover with a blue background, a guitar, and an amplifier. The middle book, 'Mullard Tube Circuits for Audio Amplifiers', has a blue cover with a circuit diagram and a tube amplifier. The bottom book, 'Guitar Amplifiers', has a red cover with a guitar and an amplifier. The books are arranged in a slightly overlapping manner, with the 'Mullard' book in the foreground.



■ 100% testing through Clio QC.

■ 100% Repeatability and Tracking!

- 100% testing through Clio QC.
- 100% Repeatability and Tracking



- 100% Torque Settings and SOP



- Anechoic measurements



- Loudsoft or Clie QC for checking systems.
- Complete turnkey OEM/ODM for drivers or systems.



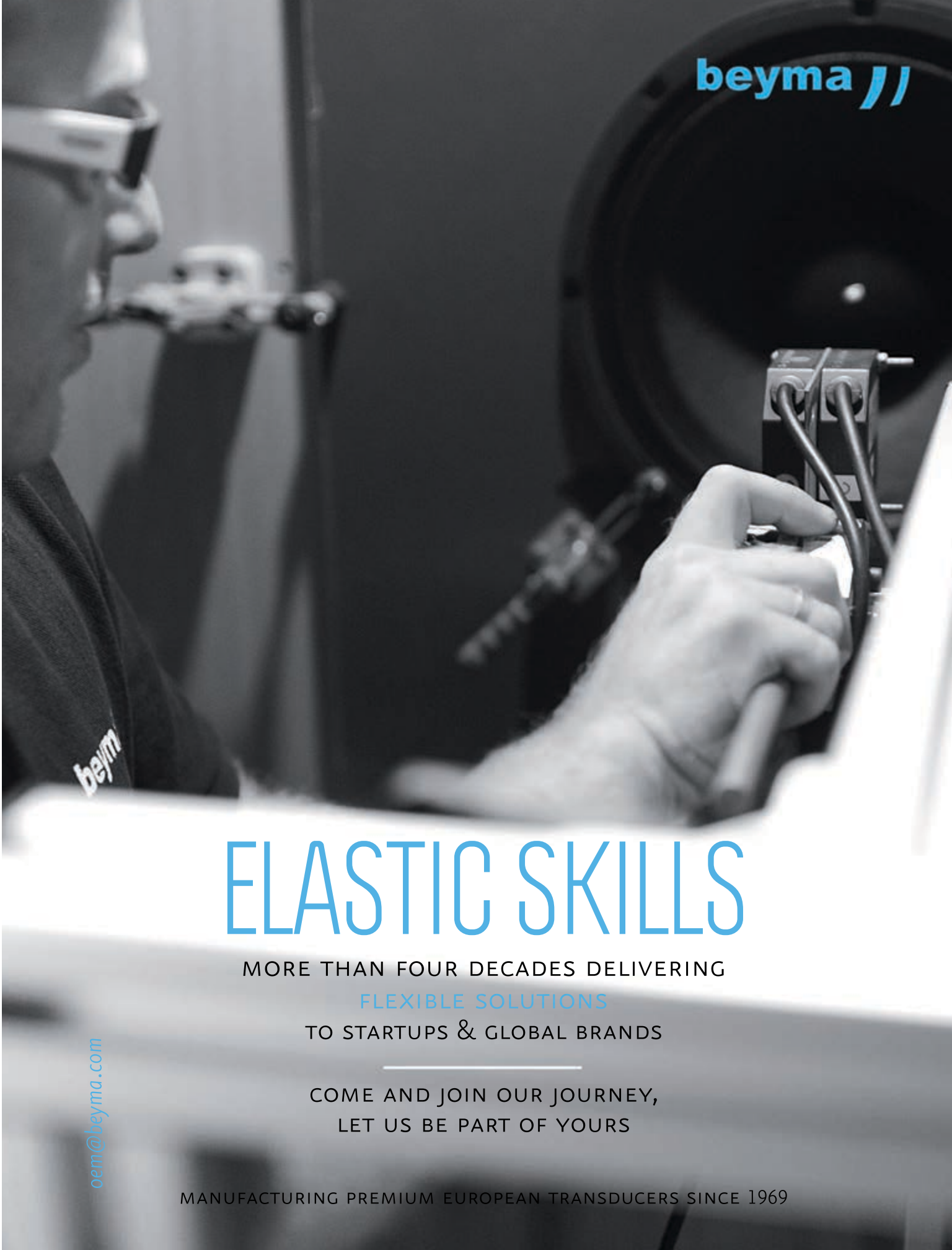
- We Listen!
- Picture is of actual listening room here in Trueanalog.



TRUEANALOG
STRICTLY OEM/ODM
DRIVERS & SYSTEMS

8 Xin Xing Rd. Xinqao Village, Shiji Town Panyu, Guangzhou PRC 511450
Tel: +86 2084555969 Web: www.trueanalog.com
E-Mail: trueanalogphilip@gmail.com Skype: [trueanalogphilip](#)





beyma //

ELASTIC SKILLS

MORE THAN FOUR DECADES DELIVERING
FLEXIBLE SOLUTIONS
TO STARTUPS & GLOBAL BRANDS

COME AND JOIN OUR JOURNEY,
LET US BE PART OF YOURS

oem@beyma.com

MANUFACTURING PREMIUM EUROPEAN TRANSDUCERS SINCE 1969

OEM SPEAKERS & DRIVERS

	Compression Drivers	Full Range	Midrange	Horns	Cone	Dome	Electrostatic	Planar	Ribbon	Paging Horns	Siren/Voice Warning	Piezo	Planar	Cone	Dome	Electrostatic	Ribbon	Woofers
Sound Lab, Inc.	•																	
Sound Sources Technology, Inc.		•	•		•	•								•	•			•
SpeakerAddict		•	•	•	•	•				•	•	•	•	•	•			•
StanleyMarquiss.com			•															
TC Sounds																		•
Transducer Lab			•		•	•								•	•			•
Trax Audio		•	•	•	•	•			•	•	•		•	•	•			•
TSG Audio		•	•															
Tymphany		•	•		•	•								•	•			•
Vertek/XTC			•		•	•			•					•	•			•

Sign up now
for the *audioXpress*
FREE
weekly e-newsletter!

Check out our innovative content and be the first to know what's happening in the audio industry.

And learn what fresh technology has piqued Editor João Martin's interest!

One click is all it takes to have this e-newsletter delivered to your inbox.

audioxpress.com





More than 25 years of experience in audio industry.

Design manufacturer of acoustic products.

Seamless manufacturing: from raw drivers to fully finished speaker systems.

Piano lacquer finished / natural wood veneer finished / solid wood / PVC speaker cabinets.

Two million square feet production base.

OEM / ODM – Our goal is to turn your design ideas into satisfactory products.

Largest anechoic chamber in Asia.



HiVi - hear the difference

HiVi OEM / ODM Department

Address: No. 1, South Dongcheng Road, Liangang Industrial Zone, Zhuhai, Guangdong, 519045, P. R. China

Tel: +86-756-6268133 Fax: +86-756-6268068 Website: www.hivi.us E-mail: oem_odm@hivi.com

96

JANTZEN AUDIO

DENMARK

www.jantzen-audio.com



Wax Coil

Top of the line copper foil inductor. Made with a unique paraffin wax impregnation. Available in 8 - 12 - 14 - 16 AWG



C-Coil

Wound around a sandwich core, and it has extremely low resistance and can shift a large amount of power without getting over heated.



Cross Coil

The original Jantzen copper foil inductor. Offering less distortion and power loss. Available in 8 - 12 - 14 - 16 AWG



Air Core Wire Coil

High-purity copper wire baked in perfect shape to create a distortion-free inductor, for all audio applications.



Iron Core Coil

High-purity copper wire wound around a Permite core, for a high inductance at the lowest cost.



Cross Cap

Our standard type PP cap. Offering great value for money. 400 VDC



Superior Z-Cap

Even the finest nuances can be heard. The sound never gets over-edged, really superb naturalness with a somewhat bright top-end. 1200 VDC - 800 VDC



SilverGold Z-Cap

More resolution, more sound stage. Lots of dynamics, fast reaction, live feeling and natural sound. 1200 VDC - 800 VDC



Silver Z-Cap

Super smooth cap without any harsh additions to the sound. Absolutely neutral tonal balance. A truly outstanding audio part. 1200 VDC - 800 VDC

Jantzen Audio Denmark offers the market's widest selection in high quality inductors. We also offer a premium selection of capacitors, resistors and other audio products.

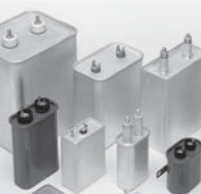
Please visit www.jantzen-audio.com for full product range and re-seller information.

Supplying the audio industry for 25 years with high quality components at competitive prices.

Realize your audio dreams

	DENMARK	FRANCE	GERMANY	INDIA
estron a/s				
Jantzen Audio Denmark				
Kyu Systems				
Akustik Perfekt				
blue planet acoustic				
Wolf von Langa				
Aesthetic Audio, LLC				
GM Audio Technics, Ltd.				
Iwai Electronics Pvt., Ltd.				
Power Electronics & Technologies				
S.S. Electronics				
Trent Engineering				
Vidyut Teletronics, Ltd.				
Wizard India Private, Ltd.				

Where Capacitors Sound Awesome



TYPICAL APPLICATIONS:

- By-Pass
- Impulse Generators
- DC Filtering
- R-C Networks

AUDIO CAPACITORS



• Ferro Resonant • Audio

• Voltage Multiplier • Motor Start

• Spike Suppression • Matched Sets

• Pulse Discharge • Power Supplies

ISO 9001:2008 REGISTERED

ARIZONA CAPACITORS, INC.

ELECTRO TECHNIC



ARIZONA
CAPACITORS

Phone: 520-573-0221 Fax: 520-573-0520

1100 S. Plumer Avenue, Tucson, AZ 85719

www.arizonacapacitors.com

Like it. Tweet it. Share it.

LISTEN UP!

.....

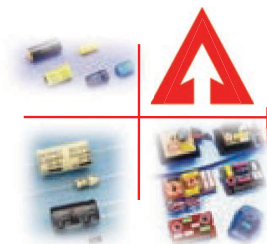
The digital edition of the
2015 Loudspeaker Industry Sourcebook
is now **FREE** for audio professionals
everywhere. Access it from your
laptop or tablet today!

.....

Visit **www.gotomylis.com**



Verizon 3G 9:58 AM 95%
LIS
SPECIAL FEATURES
2015 LIS LOUDSPEAKER INDUSTRY SOURCEBOOK
Loudspeaker Industry Status • Q&A with Industry Leaders •
Emerging Audio Technologies • World Turns 40 • Loudspeaker and Headphone
Market Trends • 25 Years of LIS • New Industry Trade Show \$20.00
■ ACOUSTIC SOLUTIONS
■ COMPONENTS
■ DESIGN SOFTWARE
■ DRIVERS
■ EARPHONES & HEADPHONES
■ ENCLOSURES & CABINETS
■ FINISHING SYSTEMS & INTEGRATED PRODUCTS
■ MANUFACTURING EQUIPMENT
■ MEASUREMENT MICROPHONES
■ MICROSPKERS



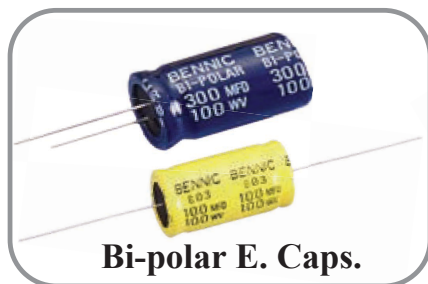
BENNIC COMPONENTS

Quality, Technic, Service

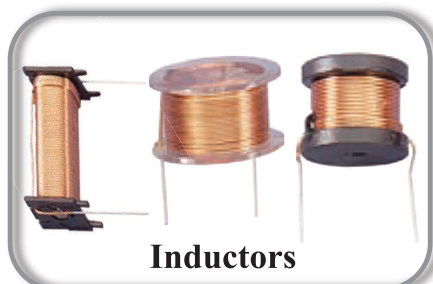
■ About "BENNIC"

- A Specialist Acoustic Parts Manufacturer, especially in **Bi-polar Electrolytic Capacitors, Metalized Film Capacitors, Inductors, Terminals, Binding Posts & X-over networks.**
- Qualified and reliable supplier with fully integrated products.
- Over 35-year experiences of technology & marketing know-how, BENNIC now is the leading brand for audio components.

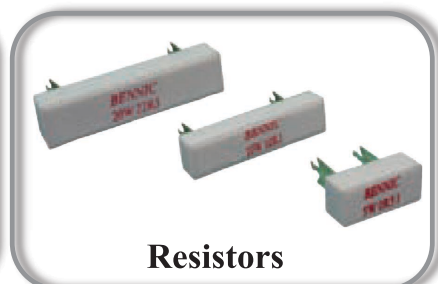
■ Our Products



Bi-polar E. Caps.



Inductors



Resistors



Met. Film Caps.



X-over Networks



Terminals / Binding Posts

"BENNIC" is One-Step solution for your success.

■ Contact Us

For more detail information, please visit our website: www.bennic.com.tw
Or message us.

BENNIC COMPONENTS

P.O. BOX 20-014 Hsin Tien, New Taipei City, Taiwan

Tel: +886 2 2765 4485

Fax: +886 2 2763 6054

Email: mail@bennic.com.tw

	Passive Components						Wire & Wiring Harnesses					
	Capacitors		Driver Protection Devices		Inductors		Plugs & Jack Dishes		Resistors		Solder	
	Attenuators	Ceramic	Electrolytic Non-Polar	Film	Air Core	Iron Core	Terminal Plates	Transformers	Electronic Crossover	Finished Passive X-over Nets	Wire & Wiring Harnesses	
ISRAEL												
Chorus Audio Group												
Coby Speakers												
ITALY												
Axiomedia												
Eighteen Sound												
Professional Audio, SNC												
MEXICO												
Aletheia AV												
NETHERLANDS												
Audio Components BV												
KBL Systems												
Millon Loudspeakers												
SPOORT.NU												
tg-acoustics												
the BEE												
POLAND												
Soniclab												
SWEDEN												
Anaview (ETAL Group)												
Audio Pro, AB												
TAIWAN												
EuroTec International, Ltd.												
Huey Tung International Co., Ltd.												
Kmaxima Group												
Maeden International, Ltd.												
THAILAND												
Audiovista												
UKRAINE												
MAG												
Magnet, Ltd.												
UNITED KINGDOM												
EuroTec International, plc												
Fane International												
Volt Loudspeakers, Ltd.												
UNITED STATES												
Advanced Transduction												
American Bass USA												
AMS Audio Enterprises, Inc.												
AntiCable Audio Co., Inc.												
Arizona Capacitors												
Audia Media Group												
Audiophiles Engineering												
Auratron Systems												
Avtek International												
Bamberg Engineering												
Carvin Corp.												

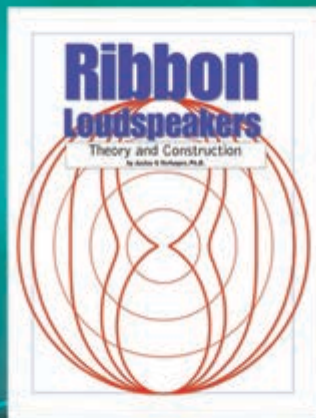
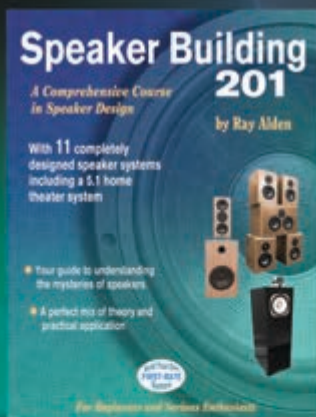
Looking for even more loudspeaker design inspiration?



Check out these two great books!

SPEAKER BUILDING 201

With this book, anyone can become a speaker builder. Learn the concepts you need **OR** choose any of the 11 tested and proven speaker designs included in this book. It features a variety of speaker projects and contains all the information you need to design a first-rate system. **\$34.95**



RIBBON LOUDSPEAKERS

This book presents the theory and history of ribbons and includes construction details for building your own ribbon loudspeakers. Often preferred for high- and mid-frequencies, they are inexpensive and can be easily constructed with minimal tools. **\$24.95**

Available now at
www.cc-webshop.com
 or call 860.289.0800

Solen Fast Capacitors™ & Solen Perfect Layer Inductors, often imitated, sometimes copied - even counterfeited - yet never equaled.



SOLEN CAPACITORS

Metallized Polypropylene Film Fast Capacitors™

- First to use the "Fast Capacitor"™ winding technique
- First to use bi-axially oriented metallized polypropylene film
- Lowest dissipation factor, lowest dielectric absorption
- Widest range of values, from 0.01 μF to 330 μF
- Wide range of voltages, from 250 Vdc to 630 Vdc.

Metallized Teflon™ Film - .22 μF - 10 μF , 1000Vdc

Silver Metallized Polypropylene Film - .1 μF - 10 μF , 700 Vdc

Teflon™ Film & Tin Foil - .033 μF - .82 μF , 1000 Vdc

Polypropylene Film & Tin Foil - .01 μF - 4.7 μF , 100 Vdc - 630 Vdc

Metallized Polyester Film - 1.0 μF - 47 μF , 160 Vdc

Non-Polar Electrolytic .5 % DF - 10 μF - 330 μF , 100 Vdc

SOLEN INDUCTORS

Perfect Layer Hexagonal Winding Air Core

- First to use Perfect Layer Hexagonal winding technique
- First to use Hepta-Litz seven strand insulated wire
- Zero distortion air core, lowest dc resistance
- Widest range of values, from 0.1 mH - 30 mH
- Wide range of wire diameters, from 0.8 mm - 2.6 mm

Contact us for the **FREE**
Solen CDROM Catalog,
 packed with speaker
 drivers, hardware, and
 crossover components
 including Solen brand.

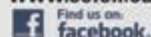
3940 Wilfrid Laurier Blvd.,
 St-Hubert, QC
 J3Y 6T1 Canada

Tel: 450.656.2759

Fax: 450.443.4949

Email: solen@solen.ca

Web: www.solen.ca



102



Adhesives & Glues

Cone Additives & Other Treatments

Cone & Suspension Components

Domes

Cones

Surrounds

Phenolic & Other Domes
Fabric/Mylar/Resin/Soft
Metal
Aluminum/Titanium/Metal
Paper Pulp
Composite
Wet Lock
Waterproofing
Lacquers
Fire Resistance
Damping
Water & Vinyl Based
Instant Adhesives
Infra-Red Cure
Epoxy
Acrylic Adhesives

	Acrylic Adhesives	Epoxy	Infra-Red Cure	Instant Adhesives	Water & Vinyl Based	Damping	Fire Resistance	Lacquers	Waterproofing	Wet Lock	Composite	Paper Pulp	Plastic	Metal	Aluminum/Titanium/Metal	Phenolic & Other Domes	Fabric/Mylar/Resin/Soft	Surrounds	Spiders	Fabric	Foam	Rubber
AUSTRALIA Stones Sound Studio Soundlabs Group Pty., Ltd.																						
AUSTRIA 4a manufacturing GmbH																						
BRAZIL Decibel Eng. Ind. PRV Audio Brazil																						
CANADA Canadian Speaker Works Peter Duminy - Loudspeaker Research & Design (DLC) Solen Electronique, Inc. The Canadian Loudspeaker Corp. Tortech Engineered Sound Products																						
CHINA Audiostar Electronics Co., Ltd. Eastern Asia Technology (HK) Ltd. -Premier Sound Group Sea Galleon International, Ltd. Sound Technology Development, Ltd. Sun Technique Electric Co., Ltd. Zhuhai HiVi Technology Co., Ltd.																						
FRANCE AAC-Applications Acoustiques de Composites Kyu Systems																						
GERMANY ATE (Audio Technology Engineering) Centrotherm Systemtechnik GmbH																						

LEADING the INDUSTRY

in both

Research & Development and Manufacturing

LOUDSPEAKER COMPONENTS, LLC

www.loudspeakercomponents.com

7596 U.S. Highway 61 S. Lancaster, WI 53813-9608

email: lsales@tds.net

Call 608-723-2127

**Foam, Cloth and Elastomer
Surround**

**Cloth
Spider**

**Paper (Press and Non - Press) and Plastic (Injection Mold and Thermoform)
Cone**

*Pouring out
Solutions,
to Sound Evolution!*



Asian Sales Manager Contact:
Mr. C.K. Woon ckwoonck@hotmail.com

Manufacturing in Lancaster Wisconsin and Nogales Mexico for sales World Wide.



NuWay
Precision Components For Quality Sound

SPEAKER PARTS A-E

	Adhesives & Glues		Cone Additives & Other Treatments				Cone & Suspension Components										Surrounds			
	Acrylic Adhesives	Epoxy	Instant Adhesives	Water & Vinyl Based	Damping	Fire Resistance	Lacquers	Waterproofing	Wet Lock	Cones		Domes			Spider & Other Domes					
										Composite	Paper/Pulp	Aluminum	Titanium	Metal	Fabric	Mylar	Resin/Soft			
																		Plastic	Metal	Fabric
INDIA																				
S.S. Electronics																				
Trent Engineering																				
Vidyut Teletronics, Ltd.																				
Wizard India Private, Ltd.																				
INDONESIA																				
SB Acoustics/Sinar Baja Electric																				
IRAN																				
Parsa Electronic																				
ISRAEL																				
Chorus Audio Group																				
Coby Speakers																				
ITALY																				
Axiomedia																				
FaitalPRO																				
OEB, S.R.L.																				
Professional Audio, SNC																				



A wide range of components since 1935 :
Hard domes, Soft domes,
Cones, Dustcaps,
Spiders, Surrounds, ...



Loudspeaker components - Made in France

ISO 9001 : 2008 certified

AAC - Applications Acoustiques de Composites
ZI Chemin de la Poterie 72340 LA CHARTRE SUR LE LOIR FRANCE - Tel. +33 (0) 2 43 79 03 60 - Fax +33 (0) 2 43 79 20 91

www.aac.fr - lis@aac.fr

SPEAKER PARTS A-E

	Adhesives & Glues		Cone Additives & Other Treatments				Cone & Suspension Components										Surrounds			
	Acrylic Adhesives	Epoxy	Instant Adhesives	Water & Vinyl Based	Fire Resistance	Damping	Waterproofing	Lacquers	Wet Lock	Cones		Domes			Spiders			Surrounds		
										Composite	Paper Pulp	Plastic	Metal	Aluminum/Titanium/Metal	Phenolic & Other Domes	Fabric/Mylar/Resin/Soft	Spiders	Fabric	Foam	Rubber
MEXICO																				
Aletheia AV																				
NETHERLANDS																				
KBL Systems																				
Millon Loudspeakers																				
SPOORT.NU																				
the BEE																				
SWEDEN																				
Audio Pro, AB																				
TAIWAN																				
Huey Tung International Co., Ltd.																				
THAILAND																				
Audiovista																				
Clarasonic																				
Grand Inter Products																				
Suzuki Kanshi (Thailand) Co., Ltd.																				

Go From Loose Parts & Components
To Power Tests In Just Minutes!!

*Relied upon by many of the world's
leading speaker manufacturers!*



HERNON®

YOUR "TOTAL SPEAKER SOLUTIONS"

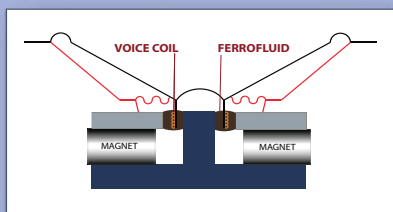
HERNON®
MANUFACTURING, INC.
High Performance Adhesives, Sealants and
Precision Processing Solutions

- Superior quality adhesives
- Precision dispensing equipment
- Numerous products for all phases of speaker assembly

877-527-0004
www.hernon.com

	Adhesives & Glues					Cone Additives & Other Treatments					Cone & Suspension Components												
	Acrylic Adhesives	Epoxy	Instant Adhesives	Water & Vinyl Based	Damping	Fire Resistance	Lacquers	Waterproofing	Wet Lock	Composite	Paper Pulp	Plastic	Aluminum/Titanium/Metal	Phenolic & Other Domes	Fabric/Mylar/Resin/Soft	Surrounds	Spiders	Fabric	Foam	Rubber			
UKRAINE																							
MAG	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
UNITED KINGDOM																							
Fane International	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Precision Devices, Ltd.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
UNITED STATES																							
A Brown Soun											•							•	•	•	•		
AcoustTex Fabrics																		•					
Acoustone Corp.																		•					
American Bass USA	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•
Audio Media Group								•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
Celestion (US Sales Office)											•		•		•								
Citadel (Bulk Molding Compounds, Inc.)											•		•		•								
Dynavox Electronics, Inc.											•	•	•	•	•	•	•	•	•	•	•	•	•
Engineered Fibers Technology						•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•
Faital, S.p.A.							•	•	•		•		•		•					•	•		•
Gingko Audio, Inc.						•					•		•		•					•			•

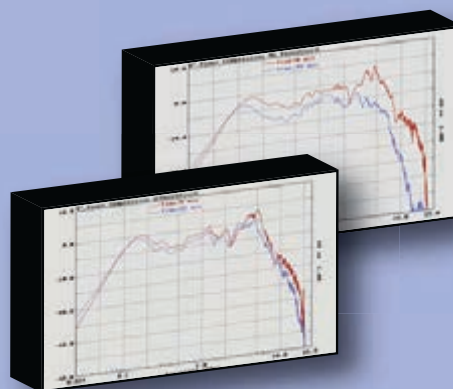
WHAT IS TO BE GAINED FROM USING FERROFLUID IN A LOUDSPEAKER?



- Voice Coil Centering
- Improved Thermal Transfer
- Increased Speaker Life
- Reduced Distortion
- Decreased Power Compression

40 years of experience in supplying ferrofluid for 300 million speakers per year to over 300 manufacturers worldwide speaks for itself. Remember the Ferrotec ferrofluid advantage when designing your loudspeakers.

Ferrotec



SPEAKER PARTS A-E

	Adhesives & Glues					Cone Additives & Other Treatments					Cone & Suspension Components									
											Domes					Surrounds				
	Acrylic Adhesives	Epoxy	Infra-Red Cure	Water & Vinyl Based	Damping	Fire Resistance	Lacquers	Waterproofing	Wet Lock	Composite	Paper Pulp	Plastic	Aluminum/Titanium/Metal	Phenolic & Other Domes	Fabric/Mylar/Resin/Soft	Spiders	Fabric	Foam	Rubber	
Global Audio Source, Inc.																				
Globe Audio Design, Inc.																				
Globe Plastics																				
Hernon Manufacturing, Inc.																				
Kinetic Audio International, Ltd.																				
Lamart Corp.																				
Listen Audio Systems, Inc.																				
Loudspeaker Components, LLC																				
Martin Sound Products																				
Materion Electrofusion																				
Meniscus Audio Group, Inc.																				
NedLab																				
New Millennium Acoustics																				
North Reading Engineering																				
Parts Express																				
RBH Sound																				
Sherwood Industries, Inc.																				
Simply Speakers																				
Transducer Lab																				
Vertek/XTC																				

SET IT AND FORGET IT...

Precision, Valveless Ferrofluid Dispensing

"Pays for itself in Fluid Saved!!"



PDS-100 Programmable
Dual Channel Dispenser

Featuring ...

- Ceramic Internals
- One Moving Part
- No Valves
- 1% Accuracy for Millions of Dispenses

Ideal for Dispensing ...

- Ferrofluids
- Adhesives
- Solvents
- Electrolytes
- Lubricants
- Slurries

Call 516-922-6050 • www.fmipump.com

FMI FLUID METERING, INC.

VOICE COIL

Can't get enough of
woofers, tweeters and
all things loudspeaker
related? Then you
should be reading
Voice Coil. It is the
only industry publication
focused directly on
loudspeakers, constructions,
and measurement.

SPOTLIGHT ON CAPACITORS AND HEADPHONES Q 32

IN THIS ISSUE

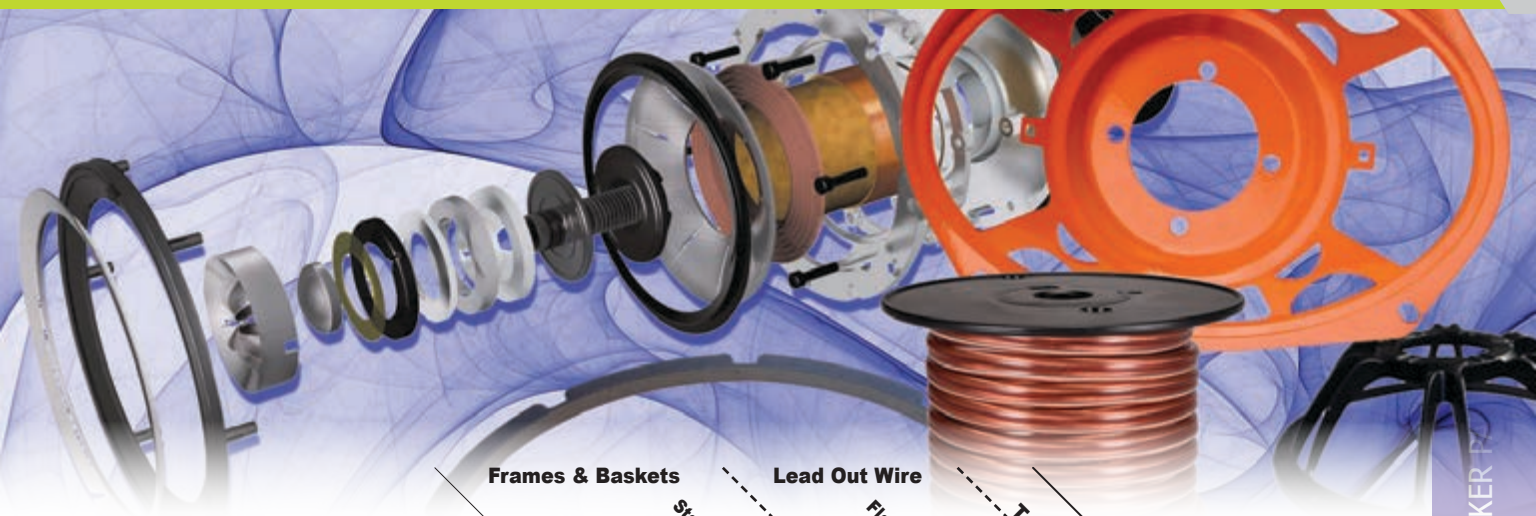
- 10 INDUSTRY NEWS & DEVELOPMENTS
- 12 PRODUCTS & SERVICES
- 14 SPOTLIGHT
- 16 DIRECTORY
- 22 TEST BENCH
- 26 INDUSTRY WATCH

- Loudspeaker industry news
- Patent announcements
- Spotlights on new technology
- Supplier lists and more...

Voice Coil is free for those
who qualify. Join today!

www.voicecoil.com

SPEAKER PARTS F-L



	Frames & Baskets				Lead Out Wire				Termination/Crimps			
	Stamped Steel	Cast Alloy	Frame Gaskets	Damped Metal Bumped	Double Bumped	Range of Diameters	Flat Strip	Beryllium Copper	Phosphor Bronze	Lead Out Wire	Stranded	Litz
BRAZIL												
Decibel Eng. Ind.	•			•	•	•	•	•	•	•		•
CANADA												
Canadian Speaker Works	•										•	•
Peter Duminy - Loudspeaker Research & Design (DLC)	•	•			•		•		•	•	•	•
CHINA												
Eastern Asia Technology (HK) Ltd.	•	•	•	•	•	•						
-Premier Sound Group	•			•	•			•	•	•	•	•
Sound Technology Development, Ltd.	•	•	•	•	•	•	•	•	•	•	•	•
Sun Technique Electric Co., Ltd.	•	•	•	•	•	•	•	•	•	•	•	•
Zhuhai HiVi Technology Co., Ltd.	•											
DENMARK												
estron a/s												•
FRANCE												
Kyu Systems	•	•							•			
INDIA												
S.S. Electronics		•										
Trent Engineering		•		•			•	•				•
Vidyut Teletronics, Ltd.							•			•	•	
Wizard India Private, Ltd.	•	•										
INDONESIA												
SB Acoustics/ Sinar Baja Electric				•	•	•	•					
IRAN												
Parsa Electronic	•	•										•
ISRAEL												
Chorus Audio Group	•							•	•	•		
Coby Speakers	•	•	•	•	•	•	•	•	•	•	•	•
ITALY												
Audioplus, S.R.L.	•	•										
FaitalPRO	•	•										
Professional Audio, SNC	•	•	•	•	•	•	•	•	•	•	•	•

SPEAKER PARTS F-L

	Frames & Baskets			Lead Out Wire			Termination/Crimps		
	Cast Alloy	Frame Gaskets	Stamped Steel	Damped Metal Bumped	Double Bumped	Range of Diameters	Flat Strip	Beryllium Copper	Phosphor Bronze
NETHERLANDS									
KBL Systems									
Millon Loudspeakers	•								
SPOORT.NU	•	•	•	•	•	•	•	•	•
the BEE	•	•	•	•	•			•	
POLAND									
Soniclab	•	•	•	•	•	•			
SWEDEN									
Audio Pro, AB	•	•	•	•	•	•	•	•	•
TAIWAN									
Huey Tung International Co., Ltd.	•	•	•	•	•	•	•	•	
Kmaxima Group				•	•	•			
Maeden International, Ltd.							•		•
THAILAND									
Audiovista	•	•	•	•	•		•	•	•
UNITED KINGDOM									
Fane International	•	•	•		•	•	•		
Precision Devices, Ltd.	•	•					•		



Become a member of *audioXpress*

audioXpress serves as your top resource to the **newest** audio innovations worldwide, provided by **audio engineering professionals**, experts in product development, and more. Combining great articles, projects, design tips and techniques, it allows you to learn and become one of the best in the audio industry.

To join, visit: **audioxpress.com**

INNOVATIONS IN AUDIO • AUDIO ELECTRONICS • THE BEST IN DIY AUDIO

audioxpress

Show Review
Audio Expo North America
AXPONA 2015
By Michael J. Kauter

Component Review
FabFilter Pro-MB and Pro-Q2
By Vincent Thibault

R&D Stories
The Birth of the World's
First True Software Radio
By Monty Gwynne/Cambridge Consultants

Sound Control
Acoustical Measuring
With Rational Acoustics' Smaart
By Vincent Thibault

You Can DIY!
Build a Single-Ended
Class-A Power Amplifier
By Gerhard Knaus

It's About The Sound
Enhanced Stereo (Part 1)
By Vincent Thibault

Audio Electronics
The Right Filter (Part 2)
Crossover Frequency Tuning
By Vincent Thibault

Practical T&M
Sound Cards (Part 2)
By Vincent Thibault

	Frames & Baskets		Lead Out Wire			Termination/Crimps		Lead Out Wire	
	Cast Alloy	Stamped Steel	Frame Gaskets	Bumped	Range of Diameters	Flat Strip	Beryllium Copper	Phosphor Bronze	Litz
UNITED STATES									
A Brown Sound									
American Bass USA	•	•	•	•	•	•	•	•	•
AMS Audio Enterprises, Inc.	•	•				•			•
Audio Media Group	•		•	•	•		•	•	•
Audiofly, Pty., Ltd.							•		
Citadel (Bulk Molding Compounds, Inc.)	•								
Dynavox Electronics, Inc.	•	•	•		•	•			
Faital, S.p.A.	•	•							
Gingko Audio, Inc.		•							•
Globe Audio Design, Inc.	•	•	•	•	•	•			
Global Audio Source, Inc.	•	•	•	•	•	•			
Kinetic Audio International, Ltd.							•		•
Materion Electrofusion								•	
NedLab	•	•							
North Reading Engineering	•	•	•	•	•	•	•	•	•
Simply Speakers							•		
Vertek/XTC							•		



Maeden Innovation

Innovative wire technology

We have wide range of wires for different speakers and usage.

- ◆ Anti-roping wire (eliminate bridge)
- ◆ Corrosion resistance wire
- ◆ Flat wire (spider use)
- ◆ Light weight wire
- ◆ Lower conductor resistance wire
- ◆ Sound performance wire
- ◆ Tweeter use wire
- ◆ Self- extinguish wire
- ◆ Enamel coating wire
- ◆ Excellent fatigue wire
- ◆ Easy process wire (soldering)
- ◆ Insulated wire

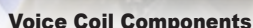


Maeden has been in the speaker/cable industry for more than 30 years and we are known for providing high-quality service. In addition, our lab can provide simulation tests to ensure our customers receive the most reliable products on the market.



Maeden Innovation Co., Ltd.
8F, 588 Rui-Guang Rd.
Taipei 11492, Taiwan

Tel: (886)28797-7966
Fax: (886)28797-7976
Website: www.maeden.com.tw
E-mail: export@maeden.com.tw



Audiostar Electronics Co., Ltd.
Eastern Asia Technology (HK) Ltd.
-Premier Sound Group
Haiyun Electronics Co., Ltd.
Huizhou Fusheng Insulation Materials, Ltd.
Kwanasia Electronics Co., Ltd.
QBE Pro Audio Co., Ltd.
Ocean Sound Technology, Ltd.
One Magnet Electronic Co., Ltd.
Sea Galleon International, Ltd.
Sound Technology Development, Ltd.

SPEAKER PARTS M-Z

	Magnetic Assemblies				Voice Coil Components										Amplifiers		
	Back Plates	Magnets		Magnetic Fluids	T-Yokes	Pole Pieces	Bobbins/Top Plates	Polyimide Tape for Collars	Magnet Wire	Voice Coil Assemblies	Voice Coil Collars	Flat Wire	Round Wire	Powered Speakers	Subwoofer Plate Amplifier	Amplifiers for Voice Coil Stacks	
		Alnico	Ferrite														
Sun Technique Electric Co., Ltd.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Zenith Audio Electronics Co., Ltd.													•	•	•		
DENMARK																	
estron a/s													•				
SIEA															•		
FRANCE																	
Kyu Systems	•			•	•	•	•	•		•		•			•	•	
GERMANY																	
Akustik Perfekt															•		
Wolf von Langa	•	•					•	•	•			•	•				
INDIA																	
Aesthetic Audio, LLC																•	•
GM Audio Technics, Ltd.																•	
Power Electronics & Technologies																•	•
S.S. Electronics	•		•				•	•				•	•				
Trent Engineering	•		•					•				•					•
Wizard India Private, Ltd.			•				•										

**Precision
Converting**
A Division of Hisco

Serving the Speaker + Voice Coil Industries since 1972

400 E. Parkridge Ave. #101
Corona, CA 92879
951-493-0200



- > Custom B Stage, Adhesive Coated Nomex® & Fiberglass
- > Custom Thicknesses from 0.025" to 0.075"
- > Master Rolls, Slit Rolls, Custom Die Cut Shapes
- > Liquid Adhesives for Winding
- > Product Development Prototyping Support
- > High Volume Capabilities
- > AS9100C, ISO9001

CONTACT:
David Carmo | 951-493-0161
dcarmo@hiscoinc.com

SPEAKER PARTS M-Z

	Magnetic Assemblies				Voice Coil Components										
	Back Plates	Magnets		Magnetic Fluids	T-Yokes	Pole Pieces	Bobbins/Formers	Polyimide Tape for Collars	Voice Coil Assemblies		Amplifiers				
		Alnico	Ferrite						Neo	Flat Wire	Round Wire	Voice Coil Stacks	Powered Speakers	Subwoofer Plate Amplifier	Amplifier for
INDONESIA															
SB Acoustics/Sinar Baja Electric							•	•							
SB Acoustics							•	•							
IRAN															
Parsa Electronic	•				•	•	•	•	•	•	•	•	•	•	
ISRAEL															
Chorus Audio Group	•	•	•	•		•	•								
Coby Speakers	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
ITALY															
Axiomedia													•	•	
FaitalPRO	•		•	•			•	•				•			
OEB, S.R.L.											•	•			
Professional Audio, SNC	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
NETHERLANDS															
Bget													•		
KBL Systems		•	•										•	•	
Millon Loudspeakers	•		•	•		•	•	•						•	
New Trades												•			
SPOORT.NU	•	•	•	•	•	•	•	•	•	•	•	•	•	•	

Magnets that meet the highest of quality standards

For magnets that adhere to the highest of quality standards, work with us. Conforming with ISO/TS 16949:2008 standards, our 20 inspectors subject every item to an intensive QC procedure, including materials inspection, as well as granularity, pressure and sintering temperature tests. We have also been a Sony Green Partner since 2006 and are ISO 14001:2004-certified – proving our commitment to the strictest of environmental standards.

Our magnets are mainly used for speakers, wind-power generating devices, motors, electronics, auto parts and more. Every month, we manufacture up to 1,200 tons of ferrite magnets, 150 tons of neodymium magnets and 30 tons of alnico magnets. All of our items are RoHS-marked for easy distribution in eco-conscious markets. For more information, inquire today.

TS16949
ISO14001
QC080000



Xiamen One Magnet Electronic Co. Ltd

Headquarters: 9/F, Lixin Plaza, 90 South Hubin Rd., Xiamen, Fujian 361004, China
Tel: (86-592) 239 7378/7379 • Fax: (86-592) 239 7381/6476
Factory: Shitou Industrial Zone, Lujiang, Anhui, China
Tel: (86-551)87937721/7722 • Fax: (86-551)87937728
onemagnet@one-magnet.com
www.one-magnet.com • www.onemag.cn

Global Sources Verified Supplier ★★★★★



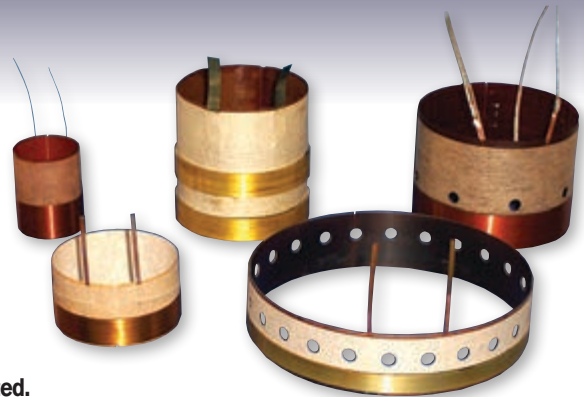
Our selection includes:
• Neodymium magnets • Ferrite magnets • Alnico magnets

SPEAKER PARTS M-Z

	Magnetic Assemblies					Voice Coil Components					Amplifiers			
	Back Plates	Magnets		T-Yokes	Pole Pieces	Bobbins/Top Plates	Polyimide Tape for Collars	Magnet Wire	Voice Coil Assemblies	Flat Wire	Round Wire	Powered Speakers	Subwoofer Plate Amplifier	Amplifier for Speakers
		Alnico	Ferrite											
the BEE			•		•	•		•	•				•	•
NORWAY Midgard Audio														•
PHILIPPINES Dai-ichi Electronics Manufacturing Corp.														•
POLAND Sveda Audio														•
SWEDEN Audio Pro, AB				•	•	•	•	•	•	•	•	•	•	•
TAIWAN EuroTec International, Ltd. Huey Tung International Co., Ltd. Kmaxima Group Wellmax Co., Ltd.		•	•	•	•	•	•	•	•	•	•	•	•	•
THAILAND Audiovista Grand Inter Products Suzuki Kanshi (Thailand) Co., Ltd.		•	•	•	•	•	•	•	•	•	•	•	•	•

SPECIALIZING IN high-temperature edge-wound and multiple layer flat-wound coils for the pro audio, home theater, and automotive aftermarket

- Highest quality domestic or imported coils.
- Custom coils available in:
 - Multi-layer wire configurations
 - Multiple lead configurations
 - Round and Flat Wire
 - Custom lead-out attachments
 - Free standing coils
 - Multiple wire types
 - Bifilar or Edgewound
 - Custom bobbin wound coils
- High temperature adhesive coated Copper and Aluminum wire in round and flat sizes. CCAW wire available in round sizes.
- Adhesive coated custom cut forms and Collars.
- Custom slit rolls of Form and Collar material available coated or uncoated.



Precision Econowind Inc.

8940 North Fork Drive, North Fort Myers, Florida 33903
Phone (239) 997-3860 Fax (239) 997-3243



Po Yun
ISO / TS 16949 Certified

Serving the speaker industry with high-quality for over 40 years

For samples, information, or a quotation, please contact
Jon Van Rhee at jon@precisioneconowind.com

• ISO 9001-2000

• ISO 14000

• TS 16949

Visit us on the web at www.precisioneconowind.com

SPEAKER PARTS M-Z

	Back Plates	Magnets			Magnetic Fluids	T-Yokes	Pole Pieces	Bobbins/Formers	Polyimide Tape for Collars	Voice Coil Assemblies	Amplifiers		
		Alnico	Ferrite	Neo							Flat Wire	Round Wire	Subwoofer Plate Amplifier
UKRAINE													
MAG		•	•	•							•	•	•
Magnet, Ltd.	•		•	•			•	•					•
UNITED KINGDOM													
Bishopsound													•
EuroTec International, plc													•
Fane International	•	•	•	•	•	•	•	•	•	•	•	•	•
Precision Devices, Ltd.	•		•	•	•	•	•	•	•	•	•	•	•
UNITED STATES													
Acoustic Design, Inc.	•						•	•			•	•	•
American Bass USA	•	•	•	•	•	•	•	•	•	•	•	•	•
AMS Audio Enterprises, Inc.	•	•	•	•			•	•				•	•
Anaview													•
Audia Media Group	•		•	•	•	•	•	•	•	•	•	•	•
Audio Nirvana Speakers													•
Auratron Systems													•
Avtek International													•
Bogen Communications, Inc.													•
Dayton Audio													•
Dynavox Electronics, Inc.	•	•	•	•	•	•	•	•	•	•	•	•	•
Faital, S.p.A.	•		•	•			•	•	•		•		•

SUZUKI KANSHI (THAILAND) CO., LTD.



WWW.SKT-BOBBIN.COM



31/2 M.2, BANMOH, PHROMBURI SINGBURI 16120 THAILAND.
 TEL: +66 36 598111, FAX: +66 36 598666
 EMAIL: SHOZO@SKT-BOBBIN.COM, SAICHOL@SKT-BOBBIN.COM,
 SALES@SKT-BOBBIN.COM



Advanced Engineered Materials



Learn About
Our Advanced
Materials

www.Materion.com/TruextentNewProducts



+1 510.661.9755
truextent@materion.com

Truextent Beryllium is RoHS compliant.
 Truextent is a registered trademark of Materion Brush Inc.

SPEAKER PARTS M-Z

	Back Plates		Magnets		Magnetic Fluids	T-Yokes	Pole Pieces	Bobbins/Top Plates	Polyimide Tape for Collars	Magnet Wire	Voice Coil Assemblies	Amplifiers	Subwoofer Plate Amplifier
	Alnico	Ferrite	Neo									Powered Amplifier for Speakers	Powered Amplifier for Speakers
Ferrotec (USA) Corp.													
Gingko Audio, Inc.													
Global Audio Source, Inc.													
Globe Audio Design, Inc.													
Hisco Precision Converting, Inc.													
Hypex Electronics, BV													
Kinetic Audio International, Ltd.													
Marchand Electronics, Inc.													
Meniscus Audio Group, Inc.													
MISCO													
NedLab													
New Millennium Acoustics													
North Reading Engineering													
Parts Express													
Precision Econowind, Inc.													
RBH Sound													
Sound Sources Technology, Inc.													
SpeakerAddict													
Transducer Lab													
Trax Audio													
WebMagnetics, Inc.													

• SPEAKER PARTS M-Z • SPEAKER PARTS M-Z • SPEAKER PARTS





Providing what you want most.....
Unique and professional products
far beyond your imagination

Bobbin materials:
Next generation highest-performance bobbin materials suitable for high-temperature applications

Voice Coil Wire:
Many kinds of round, flat, square and composite wire with high-temperature, high-integrity insulation, high purity and high conductivity

Top Quality Adhesives:
The newest type of glue for high-temperature wire insulation and adhesion.

Custom Winding techniques:
Modern and unique production techniques, capable of handling any kind of winding.

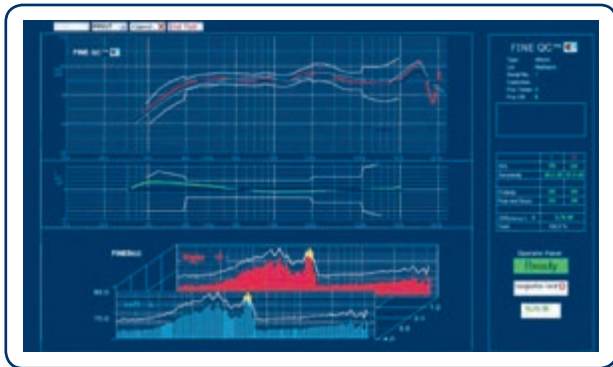
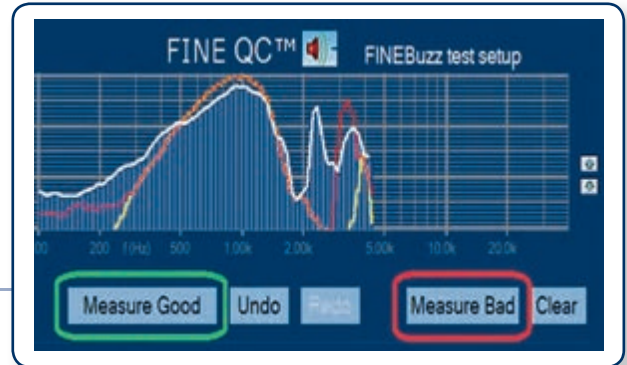
High-Precision Voice Coils:
Our special voice coils are used in a wide variety of industries and applications which require high precision.

Extra wording if you need it: Our goal is to consistently provide the highest possible quality in custom coils at a reasonable price with on-time delivery to loudspeaker OEM

A: No. 696 Huizhou Dadan, Huizhou City, Guangdong, P.R.C. / P: 516023 / T: +86-752-2299018 2295820 5805195 / F: +86-752-2295838 5805199
www.audiostar.com.cn www.voicecoil.com.cn audiostar@audiostar.com.cn mina@audiostar.cn

Best performing Rub & Buzz test (ever) FINE QC™

- Finds All Rub & Buzz
- Auto "Golden Average Unit"
- Auto Good / Bad learning
- SPL, Imp, Polarity, Sens, Rub & Buzz in one measurement < 0.5sec

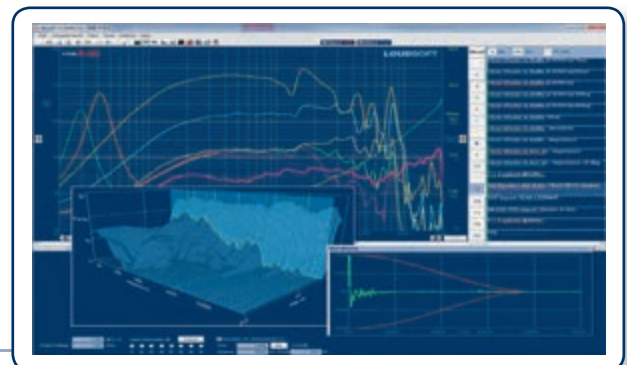


Headphone QC

- Simultaneous Left + Right test
- Full Test w Rub & Buzz < 0.5sec
- L – R Difference w tolerances
- Auto Good / Bad learning
- SPL, THD, Polarity, Sens, R&B

FINE R+D)))™

- Multiple curves 16 + 16 +
- Anechoic in normal rooms
- Normalizing of SPL to 2.83V@1m
- Real Time Analyser RTA
- Auto-Save Time: Change window / smoothing later



TEST EQUIPMENT

	Anechoic Chambers Accelerometers	Audio Analyzers	Gaussmeters	LCR Bridges	MLS	Resistance Bridges Oscilloscopes	Sine/Square Wave Oscillators	Signal Generators	Speaker Parts	Speaker Turntables	Spectrum Analyzers	1/3 Octave	Heterodyne FFT	Stroboscopes	Test Mics	Turns Counters	Testing Cabinets
INDIA																	
GM Audio Technics, Ltd.			•					•	•				•	•			•
S.S. Electronics		•	•	•	•			•	•				•	•			
Trent Engineering			•		•								•				
ISRAEL																	
Coby Speakers	•	•	•	•	•	•	•	•	•	•	•	•				•	•
ITALY																	
Audiomatica, S.R.L.	•		•		•	•	•		•	•			•	•		•	
Axiomedia					•												
FaitalPRO		•															
Professional Audio, SNC	•		•	•		•	•	•	•	•	•	•	•	•	•	•	•
SpeakerLAB, S.R.L.		•	•			•			•	•							
JAPAN																	
ETANI Electronics Co., Ltd.		•	•						•			•	•	•		•	•
LATVIA																	
Acoustic Power Lab			•														

Headphone testing

Accurate, Repeatable, Standardized



G.R.A.S. 45BC



G.R.A.S. 45CA



G.R.A.S. 43AG



Call: (330) 425-1201 Email: contact_us@gras.us Web: www.gras.us

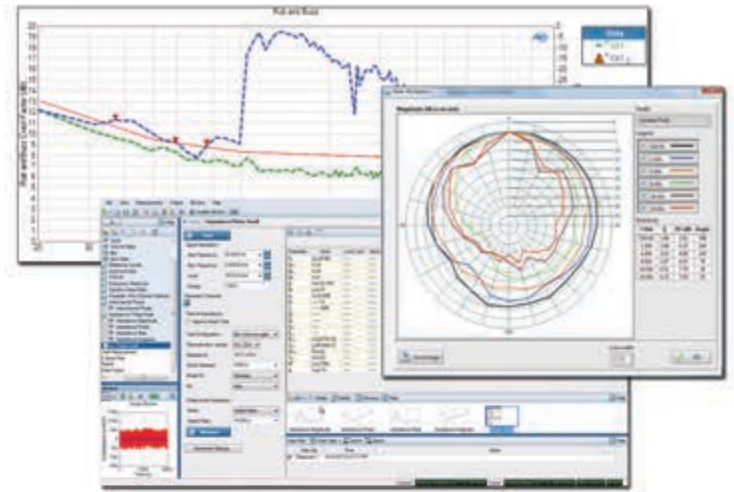
G.R.A.S.
SOUND & VIBRATION



Loudspeaker Test & Acoustic Measurement

Delivering easy automation and fast results,
with acoustic test options that include:

- Impedance / Thiele-Small
- Air leak detection
- Rub & Buzz detection



www.ap.com

(800) 231-7350

The Recognized Standard in Audio Test

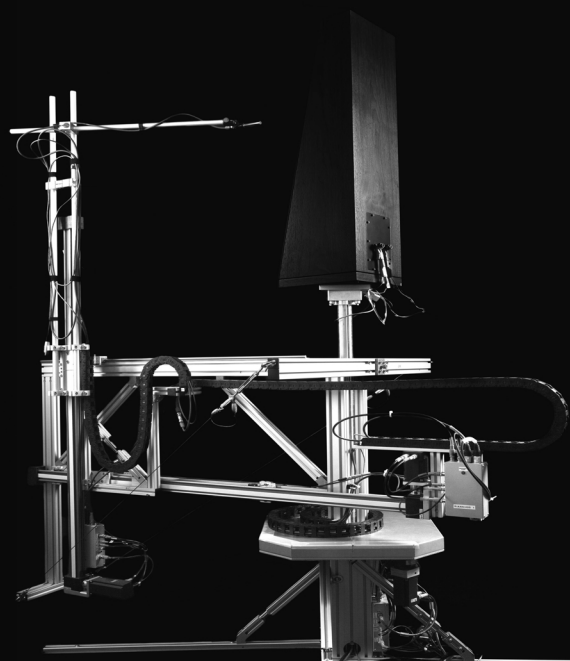


TEST EQUIPMENT

	Anechoic Chambers Accelerometers	Audio Analyzers	Gaussmeters	LCR Bridges	Multimeters	Sine/Square Wave Signal Generators	Resistance Bridges	Oscilloscopes	Speaker Oscillators	Speaker Parts	Speaker Turntables	Spectrum Analyzers	1/3 Octave FFT	Heterodyne FFT	Stroboscopes TDS	Test Mics	Turns Counters	Testing Cabinets
NETHERLANDS																		
Audio Components BV				•										•	•			
KBL Systems		•	•	•	•	•	•	•	•	•	•			•	•		•	
Millon Loudspeakers			•	•						•				•	•			
SPOORT.NU		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
the BEE			•			•								•			•	
SPAIN																		
Woods Engineering			•											•			•	
SWEDEN																		
Audio Pro, AB		•	•		•									•	•	•		
Böhmer Audio, AB			•															
SWITZERLAND																		
Megatec, AG				•														
TAIWAN																		
Sunlight Electronics Laboratory			•	•					•	•								

Near Field Scanning System

from personal audio devices to professional speakers
3D directivity measurement without an anechoic room



www.klippel.de

Order the Loudspeaker Design Cookbook today!

Teaches you the art and science of designing a better loudspeaker system. Now including: Klippel analysis of drivers, loudspeaker voicing, testing and crossover changes, and more!



ACoustics begins with ACO™

SLARM™ Successes
Red Rocks & ATPAC, Dallas

PS9200KIT

1/2 Inch
1 Inch
1/4 Inch
Systems

<2Hz >120kHz
<0dBA .170 dBSPL



3025 "Extremely Random"™
WHITE/Pink, 1 kHz Noise Generator
New 6.5 days randomness, 2 outputs,
Custom IC Design, Rugged Extrusion



7052PH/MK224PH

Phantom Powered

Measurement Mic Systems

7052PH Features:

7052E w/Titanium Diaphragm
IEC61094 Compliant

4 Hz to 22 kHz

35 mV/Pa sensitivity

<16dBA to >135 dBSPL*

4048 Preamp 18-60Vdc

WS1 3 inch windscreen

MK224PH

8Hz to 20 kHz

<12 dBA to >130 dBSPL

*>150 dBSPL with MATT20

7052PH

ACO Pacific, Inc.

www.acopacific.com sales@acopacific.com

124



Jayant Datta

Chief Technology Officer,
Audio Precision



LIS: In your opinion, is loudspeaker innovation in the next five years going to depend more on new designs, new materials, or other technologies such as digital signal processing (DSP)?

In the long run, new materials will play an important role in loudspeaker innovation. In the short run, however, designs responding to customer demands (e.g., form-factor, ease of use, functionality, and features) will shape innovations.

LIS: Where do you see more innovation coming from in recent times—consumer applications, high-end audio, pro audio applications, or installation?

Consumer applications remain the primary drivers for new innovations.

LIS: Should manufacturers look at upgrading the specifications of new products, specifically targeting high-resolution audio (HRA) applications?

High-resolution audio makes up a small portion of the audio market. Manufacturers who offer

serious products need to ensure their offerings are in keeping with customer expectations.

LIS: How are growing applications such as wireless audio in the home and mobile going to affect the loudspeaker industry?

On the one hand, wireless audio solutions are getting more reliable in conjunction with greater ease of use, fueling growth in powered (active) speaker solutions—which have the potential to be better performers than passive solutions. On the other hand, mobile audio continues to make available large amounts of low-bit rate content, and the large prevalence of wireless devices is causing some overcrowding of the wireless channels in typical homes.

We can hope for a future using a high bandwidth connection that is capable of delivering high-quality music in conjunction with power-line communication that feeds audio into the speakers through the AC line (thus, reducing some congestion of wireless channels). Portable speakers should benefit from improvements in battery technology.

LIS: Do you see potential for wearable

technologies and Internet of Things (IoT) positively affecting the audio industry—as we’ve seen with headphones?

These evolving technologies are going to introduce us to new features and functionalities that most of us have not yet thought about. There is likely to be more accessibility to audio with these technologies. If the focus of the application is convenience, then there is likely to be a decline in the quality of the audio, but they could be lucrative ventures.

LIS: Are you optimistic about the potential of immersive audio (e.g., Dolby Atmos, Auro 3D, DTS:X, etc.) applications in the home?

The average consumer in the home has not yet upgraded to an “immersive” 5.1 experience! Hence, it is unlikely that immersive audio technologies will make strong inroads in the home. Immersive audio technologies are likely

to find some traction in commercial venues and, perhaps, in high-end automotive audio solutions.

LIS: Crowdfunding (i.e., Kickstarter, Indiegogo, etc) has been powering a new generation of product designs, directly appealing to what consumers are willing to buy and all kinds of “crazy” ideas. Do you believe this will impact the business of mainstream brands in the market?

Crowdfunding is generally used to support ventures that are starting out. At that stage, these ventures are unlikely to be in a position to compete with mainstream brands. There exists the possibility that a new venture meets with incredible success and then does impact a mainstream brand ... but, by then, it will have probably evolved into a mainstream brand itself (and is unlikely to be using crowdfunding resources). *LIS*

Independent Product Test and
Evaluation for the Audio Community

MENLOEAST LABS



Instrumentation and Facilities

- KEMAR HATS with mouth simulator
- Outline turntable
- Listen SoundCheck measurement system
- Keyence laser displacement measuring system
- Eight channel diffuse sound field generator
- Wind generator and calibration anemometer

MENLO
SCIENTIFIC

Maria@menloscientific.com • tel 510.758.9001 | Michael Klasco • info@menloscientific.com • tel 510.758.9014

Bennett Prescott

**Sales & Operations Manager -
North America,
B&C Speakers NA, LLC**



LIS: In your opinion, is loudspeaker innovation in the next five years going to depend more on new designs, new materials, or other technologies such as digital signal processing (DSP)?

As one of the manufacturers that led an industry-wide shift in subwoofer performance over the last decade, looking forward it is going to be much more difficult to achieve the same performance gains. For most segments of our product line, our new designs are an evolutionary, rather than revolutionary, improvements. We have already seen a huge improvement in available materials, and active cooling and finite element analysis (FEA) optimized magnetic structures have worked along with these materials to produce power handling specifications that would have been unbelievable 15 years ago.

In general, I would say power handling is no longer the primary limiting factor in woofer performance, and now most of our efforts look to improving motor strength and excursion. That will be the primary challenge for top-tier transducer manufacturers in the next five years, and beyond.

LIS: Where do you see more innovation coming from in recent times—consumer applications, high-end audio, pro audio applications, or installation?

Recently, there have been some incredible new products in consumer and high-end audio,

from USB headphone amplifiers for the masses to wireless distributed audio for your house. To compete for attention with HD video, high-end audio is everywhere, although I am not convinced that the end result is as obvious or impressive as hoped. Modern electronics are generally plenty good at audio bandwidths. And until consumers and marketers stop blaming MP3s for poor audio quality, it will be hard to see real improvement. In fact, many of the most impressive at-home listening experiences of my life have come from equipment that significantly predates the high-resolution audio movement—even while listening to iTunes Store tracks on my phone. I have heard some truly new things in the pro audio world, but the challenges there are mostly creating that same level of sound quality at concert sound pressure levels.

For the home audio enthusiast the main difficulty is separating marketing from sound quality when purchasing loudspeakers, although some companies offer excellence in both fields. Meanwhile the power available to consumers in AV receivers and amplifiers is just astounding, and innovation there is certainly making the difference between having a TV on your wall and having an integrated home theater.

LIS: What examples of new products and recently launched innovations impressed you the most? Can you name three products that impressed you in the audio industry? (It doesn't have to be loudspeaker only.)

I think the KEF LS50 is an exceptional value and a beautiful looking compact loudspeaker. It's at a great price point, a reach for the average consumer, but within reach and a significant upgrade from the surround systems sold bundled with receivers I typically see in homes. We make a lot of coaxials, so it's great to see them accepted in the home hi-fi world as well.

I have also been thrilled with the Schiit Audio Asgard 2 headphone amplifier, which for a few hundred bucks and some decent headphones can give an audio experience equivalent to a treated listening room and tens of thousands of dollars of equipment.

Third would be Sonos' distributed speaker systems, especially its soundbar. I am not a big fan of soundbars in general, but Sonos offers a level of convenience never before available to home theater and music lovers, not to mention easy upgradeability. A practically plug-and-play home-theater surround system that can also interact with the rest of your home's audio. Even the smallest model is a solid performer, much better than most offerings its size.

LIS: Should manufacturers look at upgrading the specs of new products specifically targeting high-resolution audio (HRA) applications?

Sure, but that's a marketing question. Our products are already higher performance than most users looking for the high-resolution buzzword require. Many of our customers are going after that market aggressively and successfully. I think that really nailing that market will require careful integration with electronics, which is probably where most of the performance perceived by the end user will come from.

LIS: How are growing applications such as wireless audio in the home and mobile going to affect the loudspeaker industry?

I hope they will increase the market for small woofer components with pro-audio levels of performance. Most of the woofers in wireless audio are single-point suspension and make many compromises in linearity to save costs. New microspeakers are really impressive, the speaker in my iPhone 6 is louder than I believed possible. It's very difficult to find that level of performance scaled up into 2" to 4" woofers, but with the continued desire of consumers to keep loudspeakers as small as possible, I think

manufacturers will have to step up to pro or semi-pro designs to impress.

LIS: Do you see potential for wearable technologies and Internet of Things (IoT) positively affecting the audio industry—like we've seen with headphones?

To me, the recent trend in headphones has been mostly fashion related. The team at Beats did an incredible thing by making on- and over-ear headphones cool, and then resetting market price expectations to \$300. That leaves a lot of room to expose the general public to truly good audio in ways that nobody's 96-kHz music marketplace or fancy music player has.

There are a lot of very good headphones available to consumers for \$150 to \$200, but I'm waiting for one of the manufacturers that is already building great headphones to combine them with fashion and noise cancellation to really bat it out of the park. Companies who consider their headphones to be "high end" or "studio" could do themselves a large favor by putting a microphone and iPod controls on the cable and getting their product into airport electronics stores.

LIS: Are you optimistic about the potential of immersive audio (e.g., Dolby Atmos, Auro 3D, DTS:X, etc.) applications in the home?

I was able to experience two of the Dolby Atmos demos at the CEDIA [Custom Electronic Design & Installation Association] Expo this past fall, and I thought it was really great. I haven't been particularly impressed in the past with 7.1 or higher channel count surround sound in the home, but Atmos gives that next step up in immersion from 5.1 that I was looking for. Generally, I have found a well implemented 5.1 system with matched loudspeakers to be much more impressive per dollar spent than 7.1, 11.2, or whatever else they've come out with. Implementation will be a new experience, of course. I thought the upward firing speakers based on the floor models I heard worked pretty well, especially for more ambient sounds, but I would personally prefer to put in ceiling speakers. Finding a ceiling speaker with enough dispersion for a normal 8' ceiling, as well as enough output to keep up with surround speakers, will be hard.

LIS: Crowdfunding (i.e., Kickstarter, Indiegogo, etc) has been powering an entirely new

generation of product designs, directly appealing to what consumers are willing to buy and introducing all kinds of “crazy” ideas. Do you believe this will impact the business of mainstream brands in the market?

Kickstarter projects are always something to watch, I’ve funded a few by now—with one failure, one success, and one I’m still waiting to see how it turns out. There’s no reason that new products have to come from left field and a team with no experience in manufacturing or bringing a product to market. Big companies can increase their “cool” factor and get a more personal connection to consumers by using Kickstarter as well.

I think we all have pet projects we’d love to see take flight but aren’t sure if they’ll be a

success. Opening up a little more of your skunk works lab can be a boon if managed carefully, and with a larger company behind the product, it can be easier to get consumers to buy in. Look at the success Light Harmonic has had recently with LH Labs. They’re not a newcomer to the industry but using Kickstarter lets them come out with products they would never be able to justify tooling for otherwise.

LIS: Which speakers do you use most often to listen to music? (Name brand, model, audio chain optional.)

I have a pair of Fulcrum Acoustic RM28ac monitors on my desk, which I drive right off the headphone output of my laptop. **LIS**

Vance Dickason Consulting



Loudspeaker Product Development

Vance Dickason Consulting has been developing award winning products for numerous high profile brand names for over 20 years... experience that’s hard to find!

Add to that an available design team that includes some of the best transducers engineers, industrial designers and marketing experts I know of in the industry and you have a winning combination that would cost well over \$750,000 a year to keep in house.

With extensive experience in high-end off-wall, in-wall, on-wall, ceiling and subwoofer products plus close relationships with some of the worlds best speaker OEM’s and you have a combination of services that will accelerate your next product lineup.

We have all the best toys (Klippel, LEAP 5, LMS, CLIO, MLSSA, LSPCad, FEA), so whether its multimedia, car audio, MI, Pro, two-channel or Home Theater (including THX®), VDC has the solutions.



Tel: (503) 557-0427 vdconsult@comcast.net

ART ▼ SCIENCE ▼ TECHNOLOGY ▼ DESIGN

A Comprehensive Course in Speaker Design



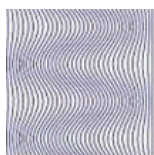
Get your copy today!

With this how-to loudspeaker book, you will be able to crank up the volume on a first-rate system that you designed and built yourself.

cc-webshop.com

Christopher J. Struck

CEO & Chief Scientist, CJS Labs



CJS Labs



LIS: In your opinion, is loudspeaker innovation in the next five years going to depend more on new designs, new materials, or other technologies such as digital signal processing (DSP)?

The primary driver of innovation in loudspeakers going forward is DSP, in particular crossovers, equalization, linearization, and active control of excursion. Innovation in material science will continue, although this may be at a slower pace driven by cost and material availability, as we have previously seen with rare earth magnet elements. Innovation in new designs should be expected to continue more or less at its current pace.

LIS: Where do you see more innovation coming from in recent times—consumer applications, high-end audio, pro audio applications, or installation?

This depends upon the pressure point. Consumer applications have driven both the price point and the size/form factor down. Pro applications continue to drive efficiency upward, whereas installation drives both ease of use and modularization. High-end audio classically drives overall performance and new designs.

LIS: What examples of new products and recently launched innovations impressed you the most? Can you name three products that impressed you in the audio industry?

I choose the iPhone 6 and its competitors, the Samsung Galaxy, and the Android phones. I would also note the Nest thermostat, and the smoke alarm.

LIS: Should manufacturers look at upgrading the specs of new products specifically targeting high-resolution audio (HRA) applications?

Regrettably, high-resolution audio is still slow to gain traction. The market priorities are still cost and ease of use. That being said, compatibility is always a concern. “Universal” players will always be required to support new formats.

LIS: How are growing applications such as wireless audio in the home and mobile going to affect the loudspeaker industry?

Wireless audio in the home is interesting, showing the possibility for smaller devices and flexibility of placement. However, even though the audio signals may be wirelessly transmitted,

for now, the units still need to be plugged in for power.

LIS: Do you see potential for wearable technologies and Internet of Things (IoT) positively affecting the audio industry—like we've seen with headphones?

It will be very interesting to see what the market penetration and acceptance is for connected wearables such as the iWatch and FitBit. Their potential as a convenient interface is undeniable. However, rampant and uncontrolled data gathering is also a potential risk as concerns about privacy continue to gather momentum.

LIS: Are you optimistic about the potential of immersive audio (e.g., Dolby Atmos, Auro 3D, DTS:X, etc.) applications in the home?

Surround sound in the home was always intended to provide a scaled version of a good cinema experience. While that has technically succeeded to a large degree, the market for this saturated due to cost and space constraints. With the exception of early adopters, the market for additional channels will likely be even more limited by these same constraints. There are a number of clever technical solutions around this, but even in these cases, adoption will still be constrained by cost.

LIS: Crowdfunding (i.e., Kickstarter, Indiegogo, etc.) has been powering an entirely new generation of product designs, directly appealing to what consumers are willing to buy and introducing all kinds of "crazy" ideas. Do you believe this will impact the business of mainstream brands in the market?

The impact of these projects has primarily been on the design process and business models. The successful ventures demonstrate that alternative approaches can deliver interesting products. However, many of these only reach critical mass once larger scale funding becomes available, either via a sale or an IPO. Notably, we never hear about all of the ones that don't make it—perhaps that is a good "filter." However, this "filtering," while useful in gauging public interest for what people know they want, may not work as well to deliver what people don't yet know they want or need (paraphrasing Steve Jobs). Nonetheless, crowdfunding does provide a viable avenue to bring ideas to the attention of both consumers and investors.

LIS: Which speakers do you use most often to listen to music? (Name brand, model, and audio chain optional.)

I custom built and designed a three-way bi-amplified stereo system with tuned ported bass enclosures (the QB3 alignment, $B = 1$, $f_0 = 25$ Hz), active crossover at 250 Hz, CAD optimized passive crossover networks at 2,800 Hz, using all Dynaudio drivers (12", 4.5", 0.75"). The audio chain includes: a Denon CD player or a Bang & Olufsen turntable to a NAD 106 preamp to a Marchand Active Crossover (fourth-order Linkwitz-Riley at 250 Hz) to a NAD 216 power amps (four channels) to the aforementioned custom loudspeakers. **LIS**

Lars-Olof Janflod

Marketing and PR Director,
Genelec

GENELEC®



LIS: In your opinion, is loudspeaker innovation in the next five years going to depend more on new designs, new materials, or other technologies such as digital signal processing (DSP)?

New materials are always of interest to inventors and will continue to play an important role as will the refined use of DSP power and associated programming. In 3-D audio situations, there will most definitely be a need for smart setup and calibrations procedures, which will only be possible with the use of DSP!

LIS: Where do you see more innovation coming from in recent times—consumer applications, high-end audio, pro audio applications, or installation?

Definitely from pro audio applications, that's where technology drives the business. In both high-end audio and consumer applications, it's in my mind much more marketing driven. Also, in installations, you can find a high degree of new innovation, particularly on the signal distribution side.

LIS: What examples of new products and recently launched innovations impressed you the most? Can you name three products that impressed you in the audio industry?

Some of the large-scale arena systems from the likes of L'Acoustics and so forth have really driven arena sound forward with quantum leaps and continues to improve. No particular product here but to mention one would be L'Acoustics' KIVA. Second, I would like to mention the development in affordable acoustic measurement equipment, no particular kind or brand but this development and innovation has really moved things forward. Last but not least is our own 8351A model, which is a small three-way system introduced last autumn with some unique new inventions.

LIS: Should manufacturers look at upgrading the specs of new products specifically targeting high-resolution audio (HRA) applications?

Absolutely, if you are in a business where it is critical.

LIS: How are growing applications such as wireless audio in the home and mobile going to affect the loudspeaker industry?

It is affecting the industry a great deal. Good or bad, who knows, but the future in the home is definitely wireless.

LIS: Do you see potential for wearable

QUESTIONS & ANSWERS

technologies and Internet of Things (IoT) positively affecting the audio industry—like we've seen with headphones?

Absolutely, apart from the headphone "revolution," we also see new microphone technologies tailor-made for DSLR cameras, phones, and iPads, also recording and editing apps for phones and iPads, which have real capacity and can make for professional working tools.

LIS: Are you optimistic about the potential of immersive audio (e.g., Dolby Atmos, Auro 3D, DTS:X, etc.) applications in the home?

Yes I am. In the demos we have done at trade shows, it definitely draws a crowd and creates demand. Still we need to see processors at the consumer level.

LIS: Crowdfunding (i.e., Kickstarter, Indiegogo, etc.) has been powering an entirely new

generation of product designs, directly appealing to what consumers are willing to buy and introducing all kinds of "crazy" ideas. Do you believe this will impact the business of mainstream brands in the market?

It can definitely be the case for someone who has a unique, brilliant, and innovative product idea but no capital to realize it!

LIS: Which speakers do you use most often to listen to music? (Name brand, model, and audio chain optional.)

When listening to music in my house, I use Genelec 1030s as LCRs and a 1092 subwoofer. For the rear channels, I use the Genelec 8020. I use an OPPO Digital player for high-resolution playback and a Denon processor. The 1030s have been with me since 1994 and they may or may not be changed to Genelec 8351s! *LIS*

Independent Product Test and
Evaluation for the Audio Community

MENLOEAST LABS



SERVICES AND SPECIALTIES

- Competitive product benchmarking, including objective and subjective analysis
- Remedial design services
- Specialists in headphones, active noise cancellation, TIA 920 testing, and wind noise testing
- Microspeaker testing and evaluation of mobile audio devices
- Convenient northeast (Boston vicinity) location

MENLO
SCIENTIFIC

Maria@menloscientific.com • tel 510.758.9001 | Michael Klasco • info@menloscientific.com • tel 510.758.9014

Mike Klasco

President, Menlo Scientific

MENLO
SCIENTIFIC



LIS: In your opinion, is loudspeaker innovation in the next five years going to depend more on new designs, new materials, or other technologies such as digital signal processing (DSP)?

Loudspeaker innovations and improvements will depend on all of the above. While the basic speaker construction of a magnet, voice coil, and cone will continue to dominate the market, planar approaches will shine when budget allows. New diaphragm materials will always be welcome for speakers as material science advancements in composites for aerospace and ballistics continue to trickle down to the speaker industry.

Signal processing for EQ and spatial enhancement are significant advantages of integrated speaker solutions such as soundbars, and the speaker protection processing used for concert sound loudspeaker management processors—and now also the amplifiers in smartphones—will soon reach the rest of the market in between these extremes.

LIS: Where do you see more innovation coming from in recent times—consumer applications, high-end audio, pro audio applications, or installation?

The smartphone market is huge and that is where the innovation and the research is most focused. The combination of signal processing and acoustic engineering is enabling higher acoustic output, wide-band audio in thinner and smaller footprint packages. From the signal processing side, we see Dolby, DTS, Waves, and others applying techniques such as spatial processing, dynamic EQ, noise suppression, and state-of-the art speaker protection into super thin smartphones.

Sadly, many of these innovations are embedded into smartphone chip sets that do not lend themselves to soundbars, receivers, or even Bluetooth speakers. The innovations from smartphone industry leaders are just focused on the design wins for hundreds of millions of pieces in Apple, Samsung, LG, and so forth. Now, even orders of a million just does not seem worth the time.

LIS: What examples of new products and recently launched innovations impressed you the most? Can you name three products that impressed you in the audio industry?

Most remarkable have been the spatial signal processing developments from Dolby, DTS,

and others. These enable a lot of creative flexibility for movies and some of the product implementations for speakers have been awesome, but for headphones less so as I have yet to hear about anything that is able to be positioned in front of me.

LIS: Should manufacturers look at upgrading the specs of new products specifically targeting high-resolution audio (HRA) applications?

From a purely engineering perspective, the “specmanship” of high-resolution (clock and overkill dynamic range) at the expense of spending the bill of materials in a more balanced design like a decent speaker(s) does not represent integrity in engineering. Do we really need a 32-bit DAC in our smartphone when the phone calls are barely intelligible? I hope wideband mobile audio, better radio frequency (RF) sections, and upgraded antennas help matters.

LIS: How are growing applications such as wireless audio in the home and mobile going to affect the loudspeaker industry?

Integration of electronics into speakers has been an ongoing trend for the last decade and now with wireless servers and whole-house audio, this further puts a challenge to the designers and manufacturers focused on quality speakers to expand into both electronics and software. Ugh!

LIS: Do you see potential for wearable technologies and Internet of Things (IoT) positively affecting the audio industry—like we’ve seen with headphones?

Wearable technology presents further challenges such as weather resistance, comfort, miniaturization, battery power management, and huge development investment.

LIS: Are you optimistic about the potential of immersive audio (e.g., Dolby Atmos, Auro 3D, DTS:X, etc.) applications in the home?

Yes, this stuff is awesome and it is helping invigorate the home-theater market.

LIS: Crowdfunding (i.e., Kickstarter, Indiegogo, etc.) has been powering an entirely new generation of product designs, directly appealing to what consumers are willing to buy and introducing all kinds of “crazy” ideas. Do you believe this will impact the business of mainstream brands in the market?

I don’t think established brands will use this path long term. But crowdfunding is definitely a good thing and I see that as a permanent additional approach for new companies to establish themselves.

LIS: Which speakers do you use most often to listen to music? (Name brand, model, and audio chain optional.)

I use whatever is left over from the last product development project or the current one. Like now, I am wearing what I left on the chair when I got into bed the previous night. **LIS**

Nir Paz

**Director of Sales and Marketing,
Morel**



LIS: In your opinion, is loudspeaker innovation in the next five years going to depend more on new designs, new materials, or other technologies such as digital signal processing (DSP)?

The innovations the audio industry has experienced in recent years are astounding. Whether it's new, advance materials and compositions or digital signal processing and testing technologies, products can reach higher levels of performance in both acoustics and industrial design. We at Morel always attempt to stay atop these innovations and explore new ways to improve our products. While many companies look to DSP technologies to cut costs when employing lower-quality raw drivers, we believe in leveraging the latest DSP technologies and new material compositions to achieve better resolution in our products.

The future of loudspeakers will be very interesting since the trend of how speakers are used is changing. The need for speakers to interface with various sources and at the same time disappear within the living space requires a whole new design paradigm.

LIS: Where do you see more innovation coming from in recent times—consumer applications,

high-end audio, pro audio applications, or installation?

There is plenty of innovation in many product segments. The breakthrough in digital audio and our ability to deliver high-resolution music easily transforms the way we consume music today and has oriented manufacturers to design products to accommodate these changes. The Custom Installation (CI) market has shown consistent growth and proved to be the one segment that presented tremendous integration technology. Our society is changing and with it is consumer behavior. The CI market has to encompass all of the recent technological developments and create an easy interface for flow-less transmission between people's homes, office, mobile, and stationary devices. So while consumer electronics can present advanced and cool technologies, it will never succeed if it cannot be integrated and communicate with everything else in our lives.

LIS: Should manufacturers look at upgrading the specs of new products specifically targeting high-resolution audio (HRA) applications?

Absolutely. High-end audio is no longer the domain of the few who spend large sums to

buy high-end audio. I believe that high-resolution audio drives loudspeaker, amplifier, and music delivery device manufacturers to design better products and deliver superb quality at moderate prices. This process makes it possible for a much wider customer base to enjoy high-quality music. With today's processing speed, nano technology for mobile storage, and data bandwidth, there is no longer any need to sacrifice quality. I think part of the success of headphones today was due to our ability to allow people to listen to high-resolution audio even when they are not listening to an expensive hi-fi system.

LIS: How are growing applications such as wireless audio in the home and mobile going to affect the loudspeaker industry?

It has already brought tremendous change to how we, as manufacturers, engineer and design products. For the consumer, it simply made listening to music easier. While wireless technology is still developing to accommodate transmission of high-resolution audio at the highest levels, it has enabled people to stay connected and listen to their audio wherever anywhere with very few obstacles. It also developed a demand by designers and architects for such products to satisfy customers who wish to hide their music sources. Speakers have become more of functional necessity rather than a furniture piece in the living room. This is the reason why we have heavily invested in developing our new SoundWall Surface invisible speakers and SoundWall LCR4, which provide a high-quality solution targeting those who are looking to seamlessly integrate speakers within the living-space.

LIS: Do you see potential for wearable technologies and Internet of Things (IoT) positively affecting the audio industry—like we've seen with headphones?

Any device connecting people with music has a positive effect on our industry as a whole. The essence of what we do in our business is bring the music closer to people. We should continue to strive to utilize whatever means necessary to achieve this noble purpose. Whether it's a pair of speakers or a pair of headphones, or other

wearable technology, it encourages people to consume music and get excited over it.

LIS: Are you optimistic about the potential of immersive audio (e.g., Dolby Atmos, Auro 3D, DTS:X, etc.) applications in the home?

There is quite a bit of buzz around immersive audio. In fact, we are working with several manufacturers on developing special drivers to meet the guidelines of ATMOS and other immersive platforms. There is no question about the highly enjoyable experience when watching a movie or listening to a music track in one of the immersive sound platforms. Whether it will become the new standard in multichannel audio and movies, time will tell. Currently, Morel is investing resources to develop raw driver solutions targeting these platforms.

LIS: Crowdfunding (i.e., Kickstarter, Indiegogo, etc.) has been powering an entirely new generation of product designs, directly appealing to what consumers are willing to buy and introducing all kinds of "crazy" ideas. Do you believe this will impact the business of mainstream brands in the market?

Crowdfunding is an interesting concept and is definitely a new way to fund projects. Aside from the finance aspects of this new initiative, it provides people with a great opportunity to get engaged in a project and see it through until it's released. It's exciting and can offer a window to the world of product development—something that has been off limits to consumers in the past. Moreover, the ability to market-test any idea before it comes to fruition allows companies to truly bring to the forefront many ideas that would be ignored and neglected otherwise. I see crowdfunding as an engine for creativity and ingenuity.

LIS: Which speakers do you use most often to listen to music? (Name brand, model, and audio chain optional.)

Depending on where I am, I usually listen to a special version of the Fat Lady speaker, our flagship speaker. *LIS*

Shawn Scarlett

**Director of Marketing—
Audio Products,
NXP Semiconductors**



LIS: In your opinion, is loudspeaker innovation in the next five years going to depend more on new designs, new materials, or other technologies such as digital signal processing (DSP)?

I see a big step coming for microspeakers. For years, we have had solutions optimized for standard amplifiers. Now we have what are called smart-amplifiers. These have feedback based systems that can control the output signal based on the mechanical actions of the speaker. They can accurately control excursion and temperature in the coil. These are used in all major smartphones and the technology is creeping into automotive and consumer applications, I expect it will be the norm in many markets in the next few years.

This shift has a major impact on speaker design. Typically, speaker makers have strived to push the resonate frequency (f_0) out of the usable range of the speaker. Because the excursion was difficult to control, pushing the resonance lower required making very-compliant mechanics which, in turn, caused many other issues. In parallel, speakers are designed with high cost materials to handle high peak temperatures. In reality, most consumer devices almost never reach those peaks.

Smart-amplifiers change this game. With a feedback system, the peak temperature can be accurately controlled, so there is no need for expensive materials in the speaker. The peak temperature can be reduced without seriously impacting the sound quality or experience. With excursion control, we will soon see the trend to lower f_0 reverse. There is no need to avoid the peak, as it can be electronically corrected. This opens the door to making lower-cost speakers with less distortion, rub-and-buzz, and other associated issues. In addition, the higher power that can be provided with a smart-amplifier can make up for reducing efficiency. Microspeaker makers are under tremendous pressure to make thinner speakers, and thinning the speaker often comes at the cost of efficiency as you need a thinner magnet.

As you can tell, I see big changes coming for the speaker business. All these changes require new ways of testing and specifying speakers, and I'm sure the manufacturers will respond with innovative ideas.

LIS: Where do you see more innovation coming from in recent times—consumer applications, high-end audio, pro audio applications, or installation?

I'm actively involved with major innovation for microspeakers. It's a place where the mechanical limits of the speaker are under tremendous pressure from the demands of consumers. I think the innovations coming from your phone will soon show up in your home, car, and concert!

LIS: What examples of new products and recently launched innovations impressed you the most? Can you name three products that impressed you in the audio industry?

Just to blow my own horn.... The TFA9887 and our newer generation products are now used by 13 of the top 15 smartphone makers. We have some competitors as well that offer similar devices. This shift to smart amps is the biggest thing I've seen in a while for the industry.

LIS: Should manufacturers look at upgrading the specs of new products specifically targeting high-resolution audio (HRA) applications?

Yes, the DSP power now available for a reasonable price is a real game changer. Considering the amount of acoustic processing we do in a phone, I'm sure someone making a full-size system could do wonders!

LIS: How are growing applications such as wireless audio in the home and mobile going to affect the loudspeaker industry?

The trend of listening to sound and watching video on personal devices has driven a major step in innovation. I expect that size pressure to extend into the home, so speakers will continue to shrink—without shrinking the sound quality.

LIS: Do you see potential for wearable technologies and Internet of Things (IoT) positively affecting the audio industry—like we've seen with headphones?

Yes! As voice input spreads into more devices audio will follow. This comes with an expectation to work well. Properly functioning audio systems require good acoustical components, and engineers who know what they are doing.

LIS: Are you optimistic about the potential of immersive audio (e.g., Dolby Atmos, Auro 3D, DTS:X, etc.) applications in the home?

Yes and No. I think smaller systems that are easier to install will continue to drive adoption, but I don't think we will hit any tipping point that will have people installing dozens of speakers. I am excited by these formats for the potential uses with virtual reality or other immersive type systems—but I expect the home theater market to be driven by upgrades not new adopters.

LIS: Crowdfunding (i.e., Kickstarter, Indiegogo, etc.) has been powering an entirely new generation of product designs, directly appealing to what consumers are willing to buy and introducing all kinds of "crazy" ideas. Do you believe this will impact the business of mainstream brands in the market?

Absolutely. Mainstream brands should be watching Kickstarter daily. It is the ideal place to conduct R&D. If you don't watch out, these ideas will steamroll your marketshare. I've worked with a few of these ideas (for audio accessories) that have had features picked up by bigger OEMs.

LIS: Which speakers do you use most often to listen to music? (Name brand, model, and audio chain optional.)

I run older Polk speakers with a custom Tripath amplifier. *LIS*

Vance Dickason

President, Vance Dickason Consulting



LIS: In your opinion, is loudspeaker innovation in the next five years going to depend more on new designs, new materials, or other technologies such as digital signal processing (DSP)?

Innovation in loudspeakers tends to come in all these areas, but mostly in materials and electronic manipulation. The most probable innovation in the near future will be wireless systems like Wireless Speaker & Audio (WiSA) technology that will be used in high-end two-channel and home-theater systems.

LIS: Where do you see more innovation coming from in recent times—consumer applications, high-end audio, pro audio applications, or installation?

Really, of those categories, pro audio has produced more interesting, new innovations than consumer audio, high-end audio, or installation. However, that said, innovation in audio and loudspeakers specifically tends to cross pollinate from one genre to the others.

LIS: What examples of new products and recently launched innovations impressed you the most? Can you name three products that impressed you in the audio industry?

As far as innovative loudspeaker design goes, what I usually see are companies rediscovering or reinventing something that was previously done in years past. However, the one speaker that impressed me the most this last year came from Genelec, the new 8351A. The 8351A incorporated an interesting dual slot-loaded configuration for the woofers that crossed over at 490 Hz to a coaxial mid/high section.

LIS: How are growing applications such as wireless audio in the home and mobile going to affect the loudspeaker industry?

I see the greatest potential in wireless audio with high-definition technology such as WiSA transmitting to powered loudspeakers. However, that said, the home audio industry has never embraced powered loudspeakers in the way that the home recording business has. Studio monitors, home, and pro are dominated by powered loudspeakers, and this has never happened in home audio. With just a few exceptions such as the Powered Advents of the late 1970s and the Meridian Audio digital-amplified speakers currently on the market, home audio is dominated by discreet amplifiers sending their content via wire to passive speakers. For wireless formats such as WiSA to become more prevalent, you have

QUESTIONS & ANSWERS

to have powered speakers in the home market. For wireless speakers to be more than just the Sonos-type desktop audio, we will have to see a big changeover to powered loudspeakers, and that will take time, if it happens at all, in the numbers required to make wireless part of large format two-channel and home-theater systems.

LIS: Are you optimistic about the potential of immersive audio (e.g., Dolby Atmos, Auro 3D, DTS:X, etc.) applications in the home?

First, all audio is immersive so these are just new flavors of immersion. With companies such as Dolby and DTS behind the new object-based formats in theaters, this is likely to become a professional standard for some time to come. But it is not absolutely guaranteed in terms of home audio. These could be passing home audio fads until the next “new” thing comes along, and only time will tell.

LIS: Crowdfunding (i.e., Kickstarter, Indiegogo, etc.) has been powering an entirely new generation of product designs, directly

appealing to what consumers are willing to buy and introducing all kinds of “crazy” ideas. Do you believe this will impact the business of mainstream brands in the market?

Not so much. Brand building really takes a tremendous amount of investment and resources. For a mature technology such as loudspeakers, the excitement level you need to get “viral” funding levels on crowdfunding sites—which is the kind of money you would need—is rare.

LIS: Which speakers do you use most often to listen to music? (Name brand, model, and audio chain optional.)

All the speakers in my home and office are, of course, my own design. The speakers I listen to for music are a modified pair from the Audax Vance Dickason Signature Series I did some time back. In my recording studio, I have a pair of studio monitors detailed in the 6th edition of the *Loudspeaker Design Cookbook*, plus a recent pair of mastering monitors I designed. *LIS*



“Connections Count!”

- **Helping buyers & sellers to connect!**
- **Supply cutting edge information & education in multiple formats.**
- **Work with other organizations to establish and promote standards.**
- **Provides a forum for networking and communications 12 months a year.**
- **Monthly newsletter and active website to maintain member engagement.**

www.almainternational.org

NEW FEATURE!

ALMA AND THE LOUDSPEAKER INDUSTRY SOURCEBOOK JOIN FORCES!

The ALMA International Buyers Guide has been incorporated into LIS. ALMA members will get a **FREE** listing in this invaluable and inclusive guide for the industry!

Go to <http://audioxpress.com/article/ALMAMembersLIS.html> for details

Where the Loudspeaker Industry Comes To Do Business!

January 3 & 4, 2016 in Las Vegas, Nevada

Exhibits, Networking, Education



The companies listed below did not complete a listing request, but their relevance in the loudspeaker industry should be noted.

Anhui Xingye T.I.T. Group www.ah-xingye.com	Kingstate Electronics Corp. www.kingstate.com.tw	Ruhwa Electronic Co., Ltd. www.ruhwa.com
Aurum Cantus www.aurumcantus.com	Klipsch Group, Inc. www.klipsch.com	Tianjin Shengkai Industrial Technology Development Co., Ltd. www.shengkai.com
Axiss Audio, Inc. www.axissaudio.com	Knowles Electronics www.knowles.com	Sheng-Yang Electronics Co., Ltd. www.dgsy.com
Bose Corp. www.bose.com	KSC Industries, Inc. www.kscind.com	Shenzhen Horn Audio Co., Ltd. www.szhorn.com/en
Bravox S.A. www.bravox.com.br	Kurt Müller GmbH & Co., KG www.kurtmueller.com	Shining Genius Electron (Shanghai) Co., Ltd. shining.www.oemol.com
Centrotec Composites GmbH www.centrotec-composites.de	Leadtek Electronics Co., Ltd. www.leadtek-ele.com	Shiuh Sheng Electronics Co., Ltd. www.shiuhsheng.com.cn
Ciare, S.R.L. www.ciare.com	McCauley Sound, Inc. www.mccauley.com	Sonavox Canada, Inc. www.sonavox.com
Crown Million Industries (International), Ltd. www.crownmillion.com	Metflex Precision Rubber Components, Ltd. www.metflex.co.uk	Sonic Electronic Co., Ltd. www.yingpo.com
Curv (Propex Operating Co., LLC) www.curvonline.com	Mogami America, Inc. www.mogamicable.com	Sonos www.sonos.com
Dainty Electric Industries Co., Ltd. www.dainty.com.tw	Nada Indah, Sdn. Bhd. Ningbo XiangYang Tech City Electronics Co., Ltd. (a.k.a ., Telecommunication Component Co.) www.xiangyangchina.com	Speakerhu Electronic Co., Ltd. www.speakerhu.com
Dolby Labs www.dolby.com	NuWay Speaker Products www.nuway-speaker.com	Star Sound Technologies www.starsound.ru
DuPont Electronic Technologies www.dupont.com	Orange County Speaker www.speakerrepair.com	Stetron International, Inc. www.stetron.com
Eternal Power, Sdn. Bhd. www.eternalpower.net	Oversound Industry Electro Acoustic, Ltd. www.oversound.com.br	Taiwan Bor Ying Corp. www.nuance.com.tw
Earthworks, Inc. www.earthworksaudio.com	P. Audio System Co., Ltd. www.paudiothailand.com	Tannoy, Ltd. www.tannoy.com
Foster Electric Co. (USA), Inc. www.foster-electric.com	Peerless Fabrikkerne (India), Ltd. www.peerlessaudio.com	TC Electronics, Sdn. Bhd. www.tcelect.com
FST Speakers Co., Ltd. www.fstspeakers.com	Penn Elcom www.penn-elcom.com	Tianyi Electronic Co. www.china-speaker.com
Goldwood Sound, Inc. www.goldwoodsound.com	PHL Audio www.phlaudio.com	Tianle (Zhejiang) Group Co., Ltd. www.tianle.com
Guangzhou Kousheng Electroacoustic Co., Ltd. www.kousheng.com	Polk Audio www.polkaudio.com	U-Sonics Power Cone Sdn. Bhd. www.u-sonics.com
Harman International Industries www.harman.com	Propex Operating Co., LLC www.propexglobal.com	US Speaker, LLC www.usspeaker.com
High Hit Enterprise Co., Ltd. www.highhit.net	Rapid Die & Molding Co. www.rdmco.com	Wanstonic Electronics, Ltd. www.palmgarden.com.tw
Huaosheng Electronic Components Factory http://wxhsdz.en.gongchang.com	RTP Co. www.rtpcompany.com	Yen Lung Electronics Factory www.yenlung.com
Jade Acoustics, Inc. www.jadeacoustics.com		

2015 Loudspeaker Industry Sourcebook

145

van Beuningenplantsoen 4
Voorschoten, Zuid-Holland, NL2253WX
+31715611100
Cees Zwaal
info@auvio.nl
www.auvio.nl

10301 Trail Ridge Lane
Tampa, FL, 33624
813-480-1321
Evan Johnson, Owner
audiophilesengineering@gmail.com
www.audiophilesengineering.com

149

5161 Rain Cloud Drive
Richmond, CA, 94803
510-758-9014
Mike Klasco, President
mike@menloscientific.com
www.menloscientific.com

17113 Minnetonka Blvd., Suite 300
Minnetonka, MN, 55345-1153
952-449-6481 x103
Jayson Tomlin, Vice President of Business
Operations
jayson.tomlin@minnetonkaaudio.com
www.minnetonkaaudio.com

2637 32nd Ave. South
Minneapolis, MN, 55406-1641
612-825-1010
800-276-9955
Dan Digre, President
ddigre@miscospeakers.com
<http://miscospeakers.com>

3380 La Sierra Ave., Suite 104-121
Riverside, CA, 92503
951-266-0030
Trevor Ryan
info@motusaudio.com
www.motusaudio.com

4675 MacArthur Court
Newport Beach, CA 92660
714-540-8900
christina.finney@mscsoftware.com
www.mscsoftware.com

254 South Cole Rd.
Boise, ID, 83709
208-850-0581
Eugen Ned
contact@nedlab.com
<http://nedlab.com>

1041-1623 Military Rd.
Niagara Falls, NY, 14304
905-592-1943
Peter Clark Dziuba, Owner
solutions.nma@gmail.com

1623 Military Rd., Unit 1041
Niagara Falls, NY 14304
solutions.nma@gmail.com

40 Catamore Blvd.
East Providence, RI, 02914
401-431-7000
800-556-3484
sales@nordsonefd.com
www.nordsonefd.com

27 Southwick Rd.
North Reading, MA, 01864
978-289-7103
John Warren
audio@northreadingeng.com
www.northreadingeng.com

607 Ellis Rd.
Durham, NC, 27703
919-244-8777
Erol Ricketts, President
nsmt@nsmt-loudspeakers.com
www.nsmt-loudspeakers.com

PO Box 231027
Portland, OR 97281
503-684-7050
ntisales@ntiam.com
www.nti-audio.com

P.O. Box 231027
Tigard, OR, 97281
503-684-7050
Tom Mintner
ntisales@ntiam.com
www.nti-audio.com

4635 Van Nuys Blvd.
Sherman Oaks, CA, 91403
877-672-2834
877-672-2834
Will Christenson, Director of Sales
info@orbaudio.com
www.orbaudio.com

804 Calle Plano
camarillo, CA 93065
805-484-4355
alan@orcadesign.com
www.orcadesign.com

1 Broadway
Tacoma, WA 98402
415-971-6488
rob.pacific.audio@gmail.com
www.PacificAudioConsulting.com

5399 East Hunter Ave.
Anaheim, CA, 92807
714-779-0450
800-325-0501
Pat Thomas
info@pactran.com
<http://pactran.com>

725 Pleasant Valley Drive
Springboro, OH, 45066
937-743-3000
866-366-4909
Brian Mitchell
wholesale@parts-express.com
<http://parts-express.com/wholesale>

18700 Yorba Linda Blvd., Suite 78
Yorba Linda, CA, 92886
714-404-8340
Ira Pazandeh
pazandehaudiodesigns@roadrunner.com

3425 Walden Ave.
Depew, NY 14043
716-684-0001
info@pcb.com
www.pcb.com

5022 Hartley Peavey Drive
Meridian, MS 39305
601-485-5365
marketing@peavey.com
www.peavey.com

24460 Mason Rd. NW
Poulsbo, WA 98370
360-697-3472
pioneer@spectraplus.com
www.spectraplus.com

16314 Madison St.
Omaha, NE, 68135
402-850-5916
John Gaudreault, President
info@planotspeaker.com
www.planotspeaker.com

2133 South Green Privado
Ontario, CA 91761
909-923-3868
sales@powerbassusa.com
www.powerbassusa.com

2121 Lindell Ave.
Murphysboro, IL, 62901
270-462-3568
Paul Roth
praudio@ymail.com

8940 North Fork Drive
North Fort Myers, FL, 33903
239-997-3860
Jon Van Rhee
jon@precisioneconowind.com
www.precisioneconowind.com

P.O. Box 6327
Orange, CA, 92863
714-722-4613
Mark Thoke
info@pteacoustics.com
<http://pteacoustics.com>

4904 Colt Rd.
Rockford, IL 61109
779-368-0382
doug@prescientaudio.com
www.prescientaudio.com

8780 Rufing Rd.
Greenville, IN 47124
812-923-0174
info@prosoundtesting.com
www.prosoundtesting.com

103 Lincoln Ave.
North Tonawanda, NY, 14120
716-597-1137
Bill Lolo, Owner
bill@psychoport.com
www.psychoport.com

3541 Stop Eight Rd.
Dayton, OH 45414
937-415-5922
hammett@puiaudio.com
www.puiaudio.com

1675 MacArthur Blvd.
Costa Mesa, CA, 92626
800-854-4079
Ray van Straten, Senior Director of
Marketing Communications and Training
& Education
info@qsc.com
www.qsc.com

382 Marshall Way
Layton, UT, 84041
800-543-2205
800-543-2205
Daren Egan
info@rbhsound.com
<http://rbhsound.com>

110 Talmadge Rd.
Edison, NJ, 08817
732-902-6100
John Krupa, Director of Sales
info@rcf-usa.com
www.rcf-usa.com

19201 Cook St.
Foothill Ranch, CA, 92610
949-588-9997
Rik Kirby, Vice President of Sales &
Marketing
sales@renkus-heinz.com
www.renkus-heinz.com

5558 East La Palma Ave.
Anaheim, CA, 92807
714-390-9514
Dave Thomas, Owner
davethomas2787@aol.com
<http://therockingclass.weebly.com>

607 Ellis Rd.
Durham, NC, 27703
919-886-7057
Erol Ricketts, President
roleaudio@roleaudio.com
www.roleaudio.com

26500 W. Agoura Rd.
Calabasas, CA 91302
800-905-5485
sales@rslspeakers.com
www.rslspeakers.com

17921 Lyons Circle
Huntington Beach, CA, 92647
714-842-9969
888-548-9898
Ted Hsieh
info@sanmingsound.com
www.sanmingsound.com

6430 Dobbin Rd., Suite C
Columbia, MD 21045
410-290-7726
info@scantekinc.com
www.scantekinc.com

447 Aviation Blvd.
SANTA ROSA, CA 95492
707-636-3002
info@schurterinc.com
www.schurterinc.com

7800 North Merrimac Ave.
Niles, IL, 60714
847-626-0300
Carole Studenroth, Vice President
carole@sherw
<http://sherwoodindustriesinc.com>

24104 Hollyoak
Aliso Viejo, CA 92656
949-436-5366
leon@sieversaudio.com

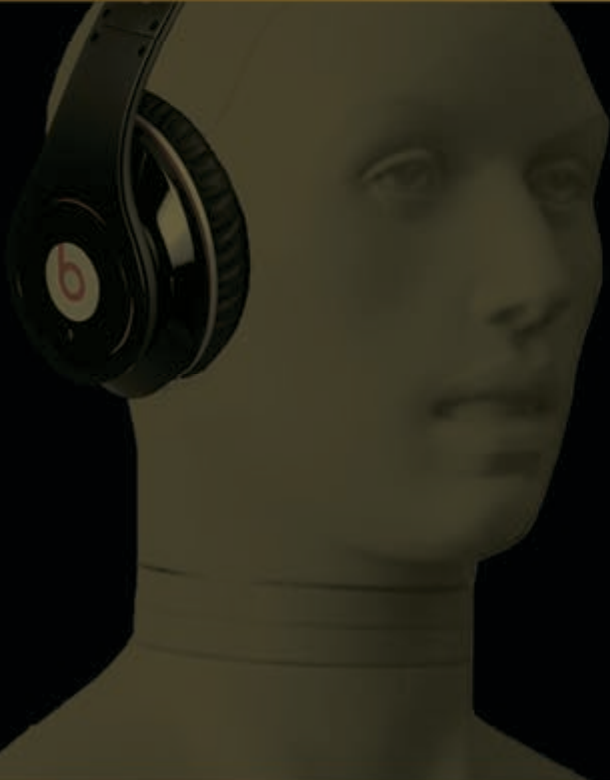
2826 23rd Ave. North
St. Petersburg, FL, 33713
727-571-1245
800-511-3343
Sean Ryan
info@simplyspeakers.com
www.SimplySpeakers.com

P.O. Box 2
Whitsett, NC, 27377
301-442-7235
Brian Smith, CEO
tech@woofertester.com
www.woofertester.com

6545 Nova Drive
Davie, FL 33317
954-474-4464
sales@wireworldcable.com
wireworldcable.com

Engineering Consulting for the Audio Community

MENLO SCIENTIFIC



- Liaison Between Materials, Suppliers, & Audio Manufacturers
- Technical Support for Headset, Mic, Speaker & Manufacturers
- Product Development
- Test & Measurement Instrumentation
- Sourcing Guidance

sponsors of "The Loudspeaker University" seminars

MENLO
SCIENTIFIC

USA • tel 510.758.9014 • Michael Klasco • info@menloscientific.com • www.menloscientific.com

A **NEW** STANDARD IN HIGH FREQUENCY.

Introducing two lightweight neodymium compression drivers from Eminence. The 100 watt **N314T-8** (1.4" exit) and **N320T-8** (2" exit) with D3™ Technology weigh in at a mere 5 lbs. and offer a smooth, extended response with a low crossover point. Designed and assembled in the USA.

Learn more at Eminence.com.



DAMPED
DIAMETRIC
DRIVE **D**³



LOUDSPEAKERS | COMPRESSION DRIVERS | CROSSEOVERS | HORN FLARES | ENCLOSURE DESIGN SOFTWARE | LOUDSPEAKER PROTECTION

EMINENCE.COM



YouTube



DESIGNED AND ASSEMBLED IN THE USA

