Loudspeaker: Yesterday, Today and Tomorrow, was a timely one as 2011 marks ALMA’s 50th year as the loudspeaker industry’s only trade association. The last few years have taken a toll on ALMA membership due to the ongoing evaporation of speaker manufacturing in the US and unsettled economic conditions worldwide. Because of this, ALMA president Stu Lumsden and the symposium committee spent the last year working with returning ALMA Executive Director, Carol Bousquet, to reinvigorate ALMA as an organization.

Originally founded in 1961 as the American Loudspeaker Manufacturers Association (ALMA), in 2001 ALMA changed its name to ALMA International (Association for Loudspeaker Manufacturing and Acoustics) to reflect its growing geographically diverse membership base.

Geographic makeup aside, the name is still ALMA. Today, ALMA is a genuine international association with continued growth in international membership and a strong demand for symposia programming in other parts of the world such as the successful ALMA European and Asian symposiums this last year.

This year’s ALMA Symposium, held in Las Vegas at the Orleans Hotel and Casino on January 4-5, had near-record attendance and, as in previous years, featured manufacturing exhibits, technical papers, industry awards, round-table discussions, panels, seminars, and committee meetings.

Here is a list of this year’s exhibitors:

- Dr. Kurt Mueller GmbH: This long-time European member was back exhibiting this year with its superb quality, advanced technology speaker cones, and tweeter diaphragms. Watching the attrition of cone companies this last year has been a bit disconcerting. Strong and commit-
Pure beryllium at an affordable price
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DYNE Analytics: Mark Beach, Dyne Analytics CEO, introduced MoTIV, a new loudspeaker CAD package that includes interactive FEA for loudspeaker motor design and optimization and designs for underhung, overhung, overhung, and dual gap driver motors (Photo 7). RESToR (suspension/surround FEA), VIBRaT (cone/dust cap FEA), and THERMo (thermodynamics FEA) are software packages that will follow MoTIV. www.dyneanalytics.com

LOUDSOFT: The company presented the new FINE R+D, which is the lab version of FINE QC. It features semianechoic FFT measurements in rooms, impedance magnitude and phase measurement, multiple display of 16 or more responses with up/down scroll, THD + 2 – 9th harmonics, cumulative decay spectrum “waterfall” plots, room measurements (with smoothing, extended low-frequency measurements), export of all measurements with phase in *.lab and *.txt format (VACS), and a curve library of up to 50 curves/responses/T/S parameters and so on. It also features Thiele/Small parameters (Fixed Mass/Delta Mass/Added Box methods), system and microphone calibration, drag and drop files to VACS and other programs, and will work with professional USB soundcards with Loudsoft/ASIO drivers. www.loudsoft.com.

Pulsus Technologies: This company exhibited its line of digital signal-processing amplification modules. Featured was the PAM100, a full-digital amplifier module that is an all-in-one digital active speaker solution. This single-board solution includes digital audio interfaces, a digital crossover and an 8-band equalizer, 2 × 50W power amplifiers for both a tweeter and woofer, and a matching switching-mode-power-supply (SMPS) and a microcontroller with PC interfaces. Also displayed was the PS8235, a single-chip solution for digital USB-streaming PC speakers. Its full-digital amplification has high efficiency and dynamic sound with 2W/channel digital effective output with USB power.

Another interesting module was the PS5331, a fully programmable audio DSP integrated with a 12-channel HD PWM modulator. The PS5331 provides state-of-the-art audio algorithms for hi-fi sound reproduction and 3D/surround synthesis. Having an audio platform-in-a-chip, the PS5331 performs intensive decoding of mainstream audio formats and value-added audio processing tasks without the expense of external memory. The extensive programmability of the DSP and the internal memory allows users to port additional value-added algorithms from both OEM and 3rd party. www.pulsus.co.kr.

Listen, Inc.: Demonstrated its new CLEAR (TM) algorithm for perceptual Rub and Buzz analysis. Steve Temme also presented a paper on the same subject, in which he detailed how the algorithm worked and shared independent test results. Listen also demonstrated SoundCheck 10.0, the latest release of the popular SoundCheck audio test and measurement software which offers many new features [see Vance Dickason’s report on p. 7]. www.listeninc.com.

Ferrotec Corporation: Displayed its latest magnetic fluids and discussed the merits of this technology with symposium attendees. Ferrotec (originally known as
Ferrofluidics Corporation), the originator and commercial founder of this technology space, has been supporting the loudspeaker industry for almost 40 years. Ferrofluids are universally recognized as beneficial components within high-frequency drivers (tweeters) and in recent years have found utilization in other loudspeaker application areas (compression drivers, full-ranges, midranges, microspeakers for mobile phones and headsets, and some lower frequency drivers). When ferrofluids are “designed-in,” their derived and expected benefits prevail. During ALMA 2011, new fluids were shown for many of these newer application areas. www.ferrotec.com.

G.R.A.S. Sound & Vibration: Demonstrated its KEMAR head simulator used for binaural measurements, which includes Bluetooth devices and headphones. Also on display was the ear and cheek simulator, which covers the same applications as the KEMAR but is used when the head and torso reflections are not considered in the measurements. www.gras.dk.

Phase Design Group: Featured their products and services for design and development, prototyping, and turn-key source solutions for the audio industry. Phase Design provides engineering and development services for a wide range of products covering the audio and consumer electronics industry, as well as industrial, marine, and industrial energy applications. Other services include quality assurance on-site in Asian and automation equipment and custom solutions. www.phasedesign.net.


Menlo Scientific: Mike Klasco, Steve Tatarnis, and Neil Shaw explained Menlo’s services to ALMA members for bringing new technology into the international supply chain, matching brand sourcing needs and the right factory, along with its specialties such as active noise cancellation, high performance microspeakers and earphone and headphone design, and signal processing for enhanced performance. www.sysid-labs.com.

KLIPPEL GmbH: Demonstrated a new measurement tool for detecting and localizing air leaks and other defects in loudspeaker systems. It combines objective and subjective testing by indicating the modulation index of the air leakage noise and separating a distortion signal which can be monitored by the operator via headphones. This tool provides significantly more sensitivity than a conventional stethoscope, and the auralization technique gives further clues on the physical cause of the problem. The analysis is based on a new demodulation technique exploiting characteristic symptoms of air leakage noise which is also used for automatic testing.

KLIPPEL also presented a cost-effective end-of-line tester for passive radiators and other suspension parts providing stiffness, compliance, f0, loss factor of the material, and other small signal parameters in less than 1s. The measurement requires no or minimal clamping of the device under test and is immune against any ambient noise found in a production environment. www.klippel.de.

Ocean Star Electronics: An OEM/ODM vendor of powered subwoofer, docks, and hi-fi speaker systems. According to director Raymond Mak, the company transferred to a new and larger factory on January 1 in order to cope with the constant increases in business. Ocean Star exhibited its vacuum tube radio, iPhone tower speaker, iPhone bluetooth dock, and wood enclosure iPhone radios with auto-time sync. Piano and veneered finished speaker systems were also displayed. Also previewed was the 300W super-slim class D subwoofer, available in the second quarter of 2011. www.os-hk.com.

Globe Plastics: Displayed waveguides, horns, cabinets, baffles, and phase plugs. Their main focus for many years was in the aerospace industry and, noticing the superior performance of the plastics materials they were using for government contracting, they decided to integrate some of these key characteristics into other industries such as sound, lighting, and automotive. www.globecomposites.com.

Nordson-EFD: This company has a long history of providing precision fluid dispensers and dispense valve systems to the speaker industry for critical application of adhesives. Products on display included the Performus and Ultimus dispensers and a variety of dispense valves. www.nordsonefd.com.

IWAI Electronics Pvt. Ltd.: As a new ALMA member and first-time exhibitor, the IWAI staff traveled a great distance to show their loudspeaker product lines. Located in Vasai, India (near Mumbai), IWai maintains a 40,000 ft² production facility containing four production lines capable of producing 800,000 speakers per month. Originally established in 1987 to supply the needs of domestic Indian consumer electronics market, today IWAI has a healthy export business serving a global customer base. IWAI displayed many OEM speakers including full-range mini-speakers, tweeters with a variety of dome and surround material combinations, high powered woofers/subwoofers, and a nice looking series of in-wall and in-ceiling speakers.
**Parts Express-Dayton Audio:** Parts Express is another new ALMA Member and a first-time exhibitor. Everyone in our industry is familiar with this company and its expansive catalog of loudspeaker-related products. In addition to handing out its latest catalog, Parts Express showed the “Dayton OmniMic Precision Measurement System,” a low-cost PC-based measurement system developed in collaboration with Liberty Instruments (Praxis). With a street price of under $300 (a great value), the system is capable of making a wide variety of audio measurements, comes with its own calibrated USB microphone, and is optimized for netbooks and laptops, making it a good choice when portability is a requirement. [www.parts-express.com](http://www.parts-express.com).

One of the many ways in which Carol Bousquet, executive director, put her mark on the 2011 symposium was the introduction of the Gala Celebration Dinner, commemorating ALMA’s 50th year of existence. In the past, the members’ dinner at Yolies Brazilian (Carol’s idea originally) would be held off-site, but this year, breaking from tradition, the Gala was held at the Orleans. The dinner event combined a keynote speaker, the first-ever industry recognition “Driver” awards, and some historical background on ALMA.

A particular highlight and honor was the attendance of Cliff Digre, founder of MISCO-Minneapolis Speaker Company, a founding 50-year member of ALMA! Industry veteran and Board Emeritus, Dr. Mike Oslac, who introduced Cliff, spoke about his own entry into the ALMA
“drinking club,” while Cliff offered some of his own first-hand remembrances of ALMA's early days and its founding fathers, including Mike Oslac’s dad! While sadly we may have strayed from our founding fathers’ traditions (the 11:30 am Happy Hour!), I can say that our behavior at the Gala would have done them proud.

Another Gala highlight was an informative keynote presentation by Chief Researcher and Economist for the Consumer Electronics Association (CEA), Shawn Dubravac, with much audience discussion following. His savvy analysis pretty much confirmed what most of us knew: TV, whole house audio, and home theater sales were way down and soundbars were a hot commodity.

After the dinner and keynote, “The Driver Award” ceremony made its debut. The Driver Award features three categories—Beryllium, Platinum, and Gold—intended to recognize contributions to ALMA and our industry. The Beryllium Lifetime Achievement Award recognizes significant and sustained contributions to the loudspeaker industry over the lifetime of a career; The Titanium Driver Award recognizes specific technical contribution, accomplishment and expertise in the loudspeaker industry; and the Gold Driver Award (Photo 3) recognizes accomplishments for contributions to ALMA, The International Loudspeaker Association.

This year’s Beryllium Driver Award Winners were Voice Coil publisher Ed Dell (presented by Peter Wostrel—stay tuned next month, when we will publish more details about Mr. Dell’s achievements that resulted in this award), Don Keele (presented by Spiro Iraclianos of Harman), Boston Acoustics founder Andy Kotsatos (Photo 4, presented by Stu Lumsden of Polk Audio), Floyd Toole (presented by Dr. Sean Olive) and Laurie Fincham (presented by Steve Hutt). The lone Platinum Driver Award went to Prof. Dr. Wolfgang Klippel (Photo 5, presented by Dave Prince), and Gold Driver Awards were received by Cliff Digre (presented by Dr. Michael Oslac), outgoing ALMA Treasurer Laurie Crook (presented by Andy McKinney), and former ALMA Executive Director Zarina Bhimani (presented by Steve Tatarunis). Next month, Part 2 of our ALMA Symposium coverage will include the round-table discussions, committee meetings, panels, technical papers, and interview with Carol Bousquet. For more, visit www.almainternational.org. VC

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Industry News and Developments
By Vance Dickason

ALMA International’s Europe Symposium
ALMA International’s Europe Symposium, “PA Speakers: Yesterday, Today and Tomorrow,” will take place April 9, at the Messe Frankfurt—and is free to attendees! This marks a series of ALMA events throughout 2011 celebrating the 50th anniversary of the founding of the International Loudspeaker Association. This program will highlight the 50-year legacy of the PA Loudspeaker Industry by looking back at historical accomplishments and analyzing future technology.


The ALMA Europe Symposium is the largest event in the world entirely dedicated to both the intellectual and practical aspects of the PA-related loudspeaker industry. It attracts visitors and attendees from around the world, and is an opportunity for loudspeaker engineers to expand their education in classes, seminars, and discussions led by some of the foremost experts in the world. For more information, visit www.almainternational.org. For on-site coordination please contact ALMA Europe VP, Dorit Larsen, at dl@loudsoft.com

Listen Inc. Releases SoundCheck Version 10
SoundCheck® 10.0 (Photo 1), the latest release of Listen Inc.’s popular audio test and measurement software package, contains a host of new features which offer both additional testing capability and improved user-friendliness. One of the most significant changes is that the memory list (SoundCheck’s database of curves, values, waveforms, and results) has been completely redesigned and is now organized into custom named folders. This is a huge benefit for anyone who needs to analyze and manipulate data, whether in an R&D or a production setting. You can group the information by

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Voice Coil

8

New Website for Klippel plus New “Sound Quality in Audio Systems” Lecture

Klippel GmbH has put up its new website at the same address, www.klippel.de. As before, it has a wealth of information about loudspeaker linearity and other issues. Besides the new website, if you plan to be near Dresden, Dr. Klippel will be giving a three-day lecture/seminar (in English) from March 28-30, titled “Sound Quality of Audio Systems” at the Auditorium Center, Dresden University of Technology, Dresden, Germany.

The lecture addresses the evaluation of sound reproduction systems using objective measurement techniques. This is the basis for designing small, light, and cost-effective loudspeakers reproducing the sound at high efficiency and sufficient sound quality. The generation of signal distortion is modeled by linear, nonlinear, and time-variant systems with lumped and distributed parameters. New measurement techniques based on those models are presented which assess electroacoustical systems while reproducing test signals and music as well.

The course makes the relationship between symptoms and physical causes of the distortion more transparent and discuses the impact on the perceived sound quality. This knowledge is important for describing loudspeaker drive units and complete systems by a comprehensive set of data based on a minimal number of measurements. The new methods and diagnostic tools are illustrated on loudspeakers used in telecommunication, automotive, multimedia, and professional applications. The lecture is supplemented by practical sections giving each participant further opportunities for learning by doing.

Special topics to be addressed include mechanical vibrations of slim TV speakers, thermal dynamics of micro-speakers, on-line monitoring, aging and climate impact on automotive speakers. The course will also cover Electroacoustical Modeling and Design, Measurements and Analysis, Interpretation and Diagnostics, and selection of issues addressed in the practical workshop. Wolfgang is a great speaker and the amount of information is substantial. Cost is 300 euros ($404 currently).
Drivers submitted for this month’s review were from old-school Euro OEM manufacturers Vifa and Scan-Speak. From Vifa (OK, the name is old school, but it’s coming out of the Tymphany China factory), a NXT licensed product, a 4.5″ diameter balanced mode radiator with a voice coil motor and cone (the Vifa BMR 85); and from the Scan-Speak Discovery line of drivers, a 4″ midwoofer—the 12W4524G00.

**Vifa BMR 85**

The Vifa BMR 85 (*Photo 1*), an interesting full-range driver, is a new incarnation of the balanced mode radiator designs from NXT (now called HiWave). Instead of exciting a BMR panel, this design uses a conventional voice coil motor to drive a flat cone; however, it’s a little more complex than that.

This 4.5″ driver is built on an eight-spoke injected plastic frame that has eight open “windows” below the spider-mounting shelf for motor and voice coil cooling. The motor uses a neodymium slug and the typical surrounding steel return path motor cup. However, the interesting part is the cone assembly.

If you look at the close-up of the rear of the BMR 85 (*Photo 2*), the flat cone is made from a honey-combed/corrugated paper layer sandwiched between two layers of paper, making it very stiff for a small diameter cone. The voice coil connects to a 2.25″ diameter conventional cone that has 6 1/8″ vents. Strategically placed around the perimeter of the flat cone are a series of six rubber damping pads, three on each side of the underneath flat cone surface placed 180° apart from the opposite three pads. This, of course, represents the balanced mode aspect of the cone in conjunction with the honeycomb flat cone. Driving the cone is a 32mm voice coil wound with copper wire on aluminum former.

Suspension is provided by a NBR surround and a black 2″ diameter flat cloth spider (damper). The voice coil is terminated to solderable terminals on opposite sides of the cone.

I commenced testing the Vifa BMR 85 full-range using the LinearX LMS analyzer and VIBox to produce both voltage and admittance (current) curves with the driver clamped to a rigid test fixture in free-air at 0.3V, 1V, 3V, and 6V. The 6V curves were too nonlinear for LEAP 5 to get a good curve fit, so I discarded them. As has become the protocol for Test Bench testing, I no longer use a single added mass measurement and instead used actual measured mass, but the manufacturer’s physically measured Mmd data.

Next, I post-processed the six remaining 550-point stepped sine wave sweeps for each BMR 85 sample and divided the voltage curves by the current curves (admittance) to produce the impedance curves, phase generated by the LMS calculation method, and, along with the accompanying voltage curves, imported to the LEAP 5 Enclosure Shop software. Because most Thiele/Small data provided by OEM manufacturers is being produced using either a standard method or the LEAP 4 TSL model, I additionally produced a LEAP 4 TSL model using the 1V free-air curves. I selected the complete data set, the multiple voltage impedance curves for the LTD model (see Fig. 1 for the 1V free-air impedance curve) and the 1V impedance curve for the TSL model in the transducer derivation menu in LEAP 5, and produced the parameters for the computer box simulations. *Table 1* compares the LEAP 5 LTD and TSL data and factory parameters for both Vifa NXT woofer samples.

**Table 1 Vifa BMR 85 Full-range**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>TSL model</th>
<th>LTD model</th>
<th>Factory</th>
</tr>
</thead>
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<tr>
<td></td>
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<td>sample 2</td>
<td>sample 1</td>
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</tr>
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<td>85.5dB</td>
<td>85.2dB</td>
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<tr>
<td>XMAX</td>
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</tr>
</tbody>
</table>
FIGURE 1: Vifa BMR 85 free-air impedance plot.

FIGURE 2: Vifa BMR 85 computer box simulations (A = sealed at 2.83V; B = vented at 2.83V; C = not displayed; D = vented at 4V).

FIGURE 3: Group delay curves for the 2.83V curves in Fig. 2.

FIGURE 4: Cone excursion curve for the 4V curve in Fig. 2.

FIGURE 5: Klippel Analyzer Bl (X) curve for the Vifa BMR 85.

FIGURE 6: Klippel Analyzer BI symmetry range curve for the Vifa BMR 85.

FIGURE 7: Klippel Analyzer mechanical stiffness of suspension Kms (X) curve for the Vifa BMR 85.
similar. However, I followed my usual protocol and set up computer enclosure simulations using the LEAP LTD parameters for Sample 1. I programmed two computer sealed box simulations into LEAP, a 292 in\(^3\) sealed box Butterworth alignment and a 79 in\(^3\) higher Q Chebychev type sealed box alignment. Figure 2 displays the results for the Vifa full-range driver in the two sealed box simulations at 2.83V and at a voltage level high enough to increase cone excursion to Xmax + 15% (0.8mm). This produced a F3 frequency of 99.7Hz with a box/driver Qtc of 0.76 for the 292 in\(^3\) sealed enclosure and –3dB = 123.5Hz with a Qtc = 1.0 for the 79 in\(^3\) simulation.

Increasing the voltage input to the simulations until the maximum linear cone excursion was reached resulted in 93dB at 4V for the smaller Chebychev sealed enclosure simulation. However, the larger box was already over exciting at 2.83V, so I didn’t do an increased voltage curve for that simulation (see Figs. 3 and 4 for the 2.83V group delay curves and the 6/13.5V excursion curves). Obviously, the BMR 85 will work better if it is band limited with a high-pass filter, and so in this respect is more of midrange than a woofer, but its real forte is producing a good power response at upper frequencies.

Klippel analysis for the Vifa full-range (our analyzer is provided courtesy of Klippel GmbH), and testing performed by Pat Turnmire, Red Rock Acoustics, produced the Bl(X), Kms(X), and Bl and Kms symmetry range plots given in Figs. 5-8. The Bl(X) curve for the BMR 85 (Fig. 5) is symmetrical and shaped as with short Xmax drivers. This curve in the Bl symmetry plot (Fig. 6) shows a 0.54mm coil-in offset at the rest position that remains constant throughout the operating range of the BMR 85.

Figures 7 and 8 show the Kms(X) and Kms symmetry range curves for the Vifa full-range driver. The Kms(X) curve is also fairly symmetrical, and has a forward (coil-out) offset of 0.9mm at the rest position, which is greater than the Xmax of the driver. Displacement limiting numbers calculated by the Klippel analyzer for the BMR 85 were XBl at 82% Bl is 1.2mm and for XC at 75% Cms minimum was 1.3mm, which means that the Bl is slightly more the limiting factor for prescribed distortion level of 10%. Because this driver will likely be band limited, or at least that’s what I would do, these offsets don’t carry much weight.

Figure 9 gives the inductance curve Le(X) for the BMR 85. Inductance will typically increase in the rear direction from the zero rest position as the voice coil covers more pole area, which is what you see here. However, the inductance variation is only 0.01mH from the in and out Xmax positions, which is practically no change at all (inductance change is related more closely to perceived distortion). Next I mounted the BMR-85 full-range in an enclosure which had a 12” × 5” baffle and was filled with damping material (foam) and then measured the transducer on- and off-axis from 300Hz to 40kHz frequency response at 2.83V/1m using the LinearX LMS analyzer set to a 100-point gated stepped sine wave sweep. Figure 10 gives the on-axis response indicating a smoothly ri-
ing response to about 2.5kHz, decreasing 7dB and then rising again to 10kHz and then beginning the high-pass rolloff at 20kHz, as advertised.

**Figure 11** displays the on- and off-axis frequency response at 0, 15, 30, and 45°. The rolloff at 30° off-axis is almost as good as a 1″ dome, so I would expect the full-range fidelity of this driver to be quite good. The only caveat to this is that because of the mass of the driver, I wouldn’t expect the upper harmonic transients to be as good as a 1″ dome, but in the type of product this driver will find application, I can’t see that as an issue.

However, go to the Naim Audio website (www.naimaudio.com) and check out the Naim Ovator S-600, E6000/pair high-end speaker. This uses an 85mm BMR like the Vifa, and obviously the Naim engineers did some tweaking, but it proves that this format is seriously capable of really outstanding performance. I did note that Naim used a 1″ metal dome rear tweeter in the S-600 which no doubt would add in some good transient performance to the perception of the BMR. Anyway, the last SPL measurement is given in **Fig. 12**, the two-sample SPL comparison for the 4.5″ Vifa driver, showing a close match to within 1-2dB throughout the operating range, which is pretty good for an inexpensive full-range.

For the remaining series of tests, I employed the Listen Inc. SoundCheck analyzer with the Listen Inc. 1/4″ SCM microphone and power supply (courtesy of

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MISCO founder, Cliff Digre received special honors at the ALMA 50th Anniversary - Winter Symposium & Industry Driver Awards. Cliff, recognized for his outstanding ALMA contributions over the past 50 years, was overheard saying, “What did we ever do without ALMA for our first 10 years”. MISCO recently celebrated their 60th year in the loudspeaker industry, designing and manufacturing high quality and high-performance loudspeakers for specific applications in a wide variety of industries, including: Medical, Military, Pro-Sound, Gaming, Aerospace, Auto/Motorcycle, Home Audio and more. Appropriately so, MISCO has developed the slogan MISCO ~ for the sound you want.

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Listen Inc.) to measure distortion and generate time frequency plots. For the distortion measurement, I mounted the BMR 85 woofer rigidly in free-air, and set the SPL to 94dB at 1m (6.8V) using a noise stimulus, and then measured the distortion with the microphone placed 10cm from the dust cap. This produced the distortion curves shown in Fig. 13.

I then used SoundCheck to get a 2.83V/1m impulse response for this driver and imported the data into Listen Inc.’s SoundMap Time/Frequency software. The resulting CSD waterfall plot is given in Fig. 14 and the Wigner-Ville (for its better low-frequency performance) plot in Fig. 15. While the intended application for this Vifa 4.5” full-range driver is multimedia and lifestyle speakers, band limited with a small subwoofer would also work well. For more on this interesting new product, visit the Tymphany website www.tymphany.com.

Scan-Speak 12W/4524G00

Next I began collecting data on the Scan-Speak 4” diameter 12W/4524G00 (Photo 3), the new midwoofer addition to the price-sensitive Scan-Speak Discovery line. Small diameter midwoofers used in mini bookshelf speakers have been an important product with Scan-Speak. The 12W is built on a six-spoke cast aluminum frame that has three 25mm × 6mm “windows” for enhanced voice coil cooling. Powering this 4” device is a conventional 15mm thick 72mm diameter ferrite

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### Table 2 Scan-Speak 12W/4524G00 Midwoofer

<table>
<thead>
<tr>
<th>TSL model</th>
<th>LTO model</th>
<th>Factory</th>
</tr>
</thead>
<tbody>
<tr>
<td>sample 1</td>
<td>sample 2</td>
<td>sample 1</td>
</tr>
<tr>
<td>FS</td>
<td>51.2Hz</td>
<td>50.9Hz</td>
</tr>
<tr>
<td>REVC</td>
<td>3.09</td>
<td>3.02</td>
</tr>
<tr>
<td>Sd</td>
<td>0.0059</td>
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<tr>
<td>QMS</td>
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<tr>
<td>QES</td>
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<td>0.32</td>
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<tr>
<td>QTS</td>
<td>0.35</td>
<td>0.29</td>
</tr>
<tr>
<td>VAS</td>
<td>7.6 ltr</td>
<td>7.7 ltr</td>
</tr>
<tr>
<td>SPL 2.83V</td>
<td>86.6dB</td>
<td>86.9dB</td>
</tr>
<tr>
<td>XMAX</td>
<td>3.0mm</td>
<td>3.0mm</td>
</tr>
</tbody>
</table>
magnet sandwiched between the front and rear plates. Features include a fiberglass slightly curvilinear cone, fiberglass 1” diameter dust cap, NBR rubber surround, 2.5” diameter black flat cloth spider, 1” (25mm) diameter voice coil (aluminum former wound with round copper wire), and gold-plated terminals.

Testing commenced with the driver clamped to a rigid test fixture in free-air and voltage and current sweeps taken at 0.3V, 1V, 3V, and 6V. Because this is a small diameter driver with only 3mm Xmax, the 6V data was too nonlinear for LEAP 5 to curve-fit, so I did not include it. I post-processed the six 550-point stepped sine wave sweeps for each 12W midwoofer sample and divided the voltage curves by the current curves (admittance) to produce impedance curves, phase added using LMS calculation method, and, along with the accompanying voltage curves, uploaded to the LEAP 5 Enclosure Shop software.

In addition to the LEAP 5 LTD model results, I also produced a LEAP 4 TSL model set of parameters using just the 1V free-air curves. I selected the final data set, which includes the multiple voltage impedance curves for the LTD model (see Fig. 16 for the 1V free-air impedance curve) and the 1V impedance curve for the TSL model, and produced the parameters in order to perform the computer box simulations. Table 2 compares the LEAP 5 LTD and TSL data and factory parameters for both Scan-Speak 4” samples.
LEAP parameter calculation results for the 12W mid-woofer were close to the factory data, although the LEAP calculated sensitivity was about 2dB lower. Given this, I proceeded to set up computer enclosure simulations using the LEAP LTD parameters for Sample 1. I programmed in two enclosures, one sealed and the other vented. For the first closed box Butterworth simulation I used a 120 in$^3$ enclosure with 50% fiberglass fill material, and for the second vented box, a larger volume of 251 in$^3$ QB3 with 15% fiberglass fill material tuned to 55.4Hz.

**Figure 17** displays the results for the 12W/4524G00 in the sealed and vented boxes at 2.83V and at a voltage level high enough to increase cone excursion to Xmax + 15% (4.5mm). This resulted in a $F3 = 109Hz$ with a box/driver Qtc of 0.69 for the 120 in$^3$ closed box design and a $-3dB = 72Hz$ for the 251 in$^3$ vented simulation. Increasing the voltage input to the simulations until the maximum linear cone excursion was reached generated 102dB at 12V for the sealed enclosure simulation and 103.5dB with same 12V input level for the larger ported enclosure (see Figs. 18 and 19 for the 2.83V group delay curves and the 12V excursion curves). Very reasonable performance for a 4” woofer.

Klippel analysis for the 12W midwoofer produced the Bl(X), Kms(X), and Bl and Kms symmetry range plots given in Figs. 20-23. The Bl(X) curve (Fig. 20) is moderately broad and symmetrical, with a coil-in (rearward) offset. In the Bl symmetry range curve in Fig. 21, there is a 0.8mm coil-in (rearward) offset that goes to 0.3mm at the physical Xmax position (3mm), so not too bad.

**Figures 22 and 23** give the Kms(X) and Kms symmetry range curves for the 4” midwoofer. The Kms(X) curve is even more symmetrical. **Figure 23**, the Kms symmetry range plot, shows a 0.35mm coil-in offset at the rest position that increases somewhat to 0.5mm at the physical Xmax of the driver. Displacement limiting numbers calculated by the Klippel analyzer for the midrange were XBl at 82% Bl = 3.4mm and for XC at 75% Cms minimum was 2.4mm, which means that for this 4” midwoofer, the suspension offset is the most limiting factor for prescribed distortion level of 10%.

**Figure 24** gives the inductance curves L(X) for the 12W/4524G00, which shows a typical situation where the inductance increases and the voice coil travels inward covering more of the pole piece. Inductance swing from Xmax forward to Xmax rearward is about 0.21mH inductance. Having Scan-Speak add a copper cap to the pole will decrease the inductive swing, plus you could incorporate the copper cap along with a non-conducting former and get some reasonable subjective improvement, but, of course, you just increased the cost of a cost-effective product!

With the Klippel testing finalized, I mounted the 12W midwoofer in an enclosure which had a 15” × 5” baffle and filled with foam damping material and proceeded to measure the driver frequency response both on- and off-axis from 300Hz to 40kHz at 2.83V/1m using a 100-point gated sine wave sweep. **Figure 25** depicts the...
FIGURE 22: Klippel Analyzer mechanical stiffness of suspension Kms (X) curve for the Scan-Speak 12W/4524G00.

FIGURE 23: Klippel Analyzer Kms symmetry range curve.

FIGURE 24: Klippel Analyzer L(X) curve for the Scan-Speak 12W/4524G00.

FIGURE 25: Scan-Speak 12W/4524G00 on-axis frequency response.
“There are many dome tweeters out there [...] But none of them sound as dynamic as the AMT.”

Dick Olsher in The Absolute Sound® 11/2006, reviewing a prominent speaker featuring our AMT® 2440

FIGURE 26: Scan-Speak 12W/4524G00 on- and off-axis frequency response.

FIGURE 27: Scan-Speak 12W/4524G00 two-sample SPL comparison.

FIGURE 28: Scan-Speak 12W/4524G00 SoundCheck distortion plots.

FIGURE 29: Scan-Speak 12W/4524G00 SoundCheck CSD waterfall plot.
on-axis response resulting in a very flat rising response that is \( \pm 1.68 \text{dB} \) from 300Hz to 4.5kHz with a small peak just before the low-pass rolloff. Figure 26 has the on- and off-axis frequency response at 0, 15, 30, and 45°. -3dB at 30° with respect to the on-axis curve occurs at 4.5kHz, so a 3-4.5kHz crossover frequency would be appropriate for this Scan-Speak small woofer. And finally, Fig. 27 gives the two-sample SPL comparisons for the 4” 12W driver, showing a good match within the operating range.

For the last body of testing on the Scan-Speak 4” mid-woofer, I again fired up the SoundCheck analyzer and SCM microphone and power supply to measure distortion and generate time frequency plots. Setting up for the distortion measurement again consisted of mounting the woofer rigidly in free-air, and the SPL set to 94dB at 1m (5.8V) using a noise stimulus (SoundCheck has a software generator and SPL meter as two of its utilities), and then the distortion measured with the SCM microphone placed 10cm from the dust cap. This produced the distortion curves shown in Fig. 28.

For the last test on the 12W, I used the SoundCheck analyzer to get a 2.83V/1m impulse response for this driver and imported the data into Listen Inc.’s SoundMap Time/Frequency software. The resulting CSD waterfall plot is given in Fig. 29 and the Wigner-Ville (for its better low-frequency performance) plot in Fig. 30. For more on this midrange and all the other great Scan-Speak drivers, visit www.scan-speak.dk. VC

Figure 28: Scan-Speak 12W/4524G00 SoundCheck Wigner-Ville plot.

For the last test on the 12W, I used the SoundCheck analyzer to get a 2.83V/1m impulse response for this driver and imported the data into Listen Inc.’s SoundMap Time/Frequency software. The resulting CSD waterfall plot is given in Fig. 29 and the Wigner-Ville (for its better low-frequency performance) plot in Fig. 30. For more on this midrange and all the other great Scan-Speak drivers, visit www.scan-speak.dk. VC

FIGURE 30: Scan-Speak 12W/4524G00 SoundCheck Wigner-Ville plot.

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CEDIA EXPO: Speaker Technology Trends
By Mike Klasco and Nora Wong

CEDIA EXPO (www.cedia.net), which has become the dominant US trade show for home theater, whole house audio, and video, offers a showcase for new technologies, training, and networking in the residential electronic systems industry. The 2010 CEDIA EXPO took place in Atlanta in late September with almost 21,000 attending—a bit more than last year. Considering the state of the whole house audio, home automation, and home theater businesses, attendance was better than most hoped for. And taking into account the dismal participation of the industry at the recent regional EHX shows (www.ehxweb.com), which focus on the same markets, CEDIA held its own against last year’s performance.

High-end audio electronics brands such as Parasound (www.parasound.com) did not show this year, while B&K did not make it period, closing their doors as I write this. On a brighter note DM (Denon/Marantz, www.d-mpro.com) and their McIntosh group were back at CEDIA after a gap of a couple years; so was speaker maker NHT (www.nhthifi.com).

At the CEDIA Expo the first day was reserved for training classes, with more training and exhibitions the follow-
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Headphone) fame used to say, was “DC to light.”

One online “magazine” characterized the high-end JBL Synthesis system (Photo 3) as “HTiB” (home theater in-a-box). At $88K, it is quite a box of goodies. All of Harman’s premium brands in one system is not for Best Buy—all the speakers, interconnects, along with EQ and THX processor and Levinson amplifiers; TV nor batteries included.

Thiel (www.thielaudio.com) (Photo 4) has always been known for its innovative driver construction. From its underhung voice coil topology and corrugated metal diaphragm to its coaxial tweeter, this is a quite refreshing change from the endless woofers and tweeters mounted on baffle that dominated the show floor.

Planar speaker systems also spiced up the exhibition area. The usual suspects were all here. Wisdom Audio (www.wisdomaudio.com) was showing its award-winning Sage series with thin-film planar tweeters. BG (www.bgcorp.com) displayed its wide range of in-walls and floor-standing speakers. MartinLogan’s new electromotion range (www.martinlogan.com) will ship in March 2011 and has an air motion (Heil) top-end. ADAM Audio founder and designer Klaus Heinz (http://de.linkedin.com/pub/klaus-heinz) was a protégé of Oscar Heil and has worked with air motion drivers for decades. Klaus has expanded ADAM’s product line from respected studio monitors to audiophile home theater.

While flat (planar) speakers are sexy, sometimes subtlety is classier—like invisible speakers (Photo 5). A trend that has been off the radar (perhaps due to its stealth characteristics!) is invisible speakers, which have been around
using various technologies for many years. Bergami’s Sound Accompany (variously known as BES, BEST, and later Sound Accompany) used its flat panel technology (co-licensed to nxt). Sound Accompany applied its techniques to a wall panel speaker that would later be plastered over. Today this innovation lives on as Sonance’s SA series, and Alex Bergami continues to support new refinements. Sonance (www.sonance.com) offers a range of various levels of subtlety in installation, including elegant but pricey Trufit in-walls, ceiling, and electrical box products.

Stealth (www.stealthacoustics.com) showed a full product line of invisible (wall panel) speakers, which, like some of the others, use a hybrid approach of a woofer and nxt exciters for the upper range. Amina uses a full-range nxt solution with rather beefy nxt exciters. Induction Dynamics (www.inductiondynamics.com) demonstrated its solid drive wall exciters. Originally using a sonar technology material (Terfenol-D), the latest development uses a push-pull neo magnetic structure—and the sound quality is quite decent now.

On the existential speaker side, TON showed Buddha and egg-shaped speakers with gold finish (Photo 6). The guts were premium, using Tannoy (www.tannoy.com) coax speakers, along with pricing that was also out of this world.

**IP Speakers Netstreams**

Atlantic (www.atlantictechnology.com) and Polk (www.polkaudio.com) had IP addressable speakers using StreamNet technologies (Photo 7). While these were not new products, NetStreams (www.netstreams.com) has boosted R&D development since its acquisition last year by ClearOne (www.clearone.com). The SpeakerLinX IP decoder model #SL-2150, which is a dual monoblock amplifier capable of producing 600W RMS at 4Ω, was evidence of this new effort. Also added this year is BlueTooth to all of the IP speaker decoders that enable streaming wirelessly from your iPad/iPhone directly to any of your IP speakers without the need to have the device in a dock.

Overall, it was a strong show considering the condition of whole house AV, home automation, and home theater markets.  VC
Audiovox has announced that it intends to buy Klipsch Group, the home-speaker maker whose brands include Klipsch, Jamo, Mirage, and Energy. Audiovox (www.audiovox.com) said it recently signed a non-binding term sheet to purchase all of the shares of Klipsch Group (www.klipsch.com) and its worldwide subsidiaries. The transaction is subject to the completion of due diligence, negotiations, and the signing of definitive agreements and requisite approvals, said Audiovox, which expects to finance this transaction through a combination of cash and a committed credit facility. Additional terms of the transaction were not disclosed.

Jade Design, the ODM/OEM developer of home and professional audio products (www.jadedesign.com), has purchased Sherbourn Technologies (www.sherbourn.com) and plans to expand the home audio brand’s selection to include all of the components of a two-channel audio system and a home theater system, excluding displays. Jade has the resources to take what Jade Design’s president Dan Laufman called a “profitable, well-run” brand to the “next level of competitive capabilities” while “preserving the integrity of the brand.” Sherbourn’s current lineup consists mainly of amplifiers, including two-channel, multichannel, and multizone amps, but it also offers a tuner, AV preamp/processor, and AV receiver.

Jade, which also owns direct-to-consumer audio supplier Emotiva Audio, said it will continue to market Sherbourn products only through custom installers. Sherbourn president and founder Ron Fone will remain with Sherbourn as director of sales. Fone has held key management positions in the audio industry since the 1970s and was president of McIntosh and Acoustic Research. Fone will continue to work out of Massachusetts, but Sherbourn’s remaining sales, marketing, and technical staff will move to Tennessee from their Billerica, Mass., offices.

In the next three to six months, Jade will add in-room speakers and powered subs to the Sherbourn line as well as architectural speakers optimized for home theater use. Jade is also developing a reference CD transport and a Blu-ray player for Sherbourn, which exhibited new AV receivers and preamp-processors that incorporate the brains of a Control 4 home-control system at CES. The C4 technology also enables the components to control a multiroom-audio system when connected to an external switcher. Eventually, the company will expand its architectural-speaker lineup to include distributed-audio speakers.

The Control4 products were originally shown at last year’s CEDIA Expo under Jade’s then-planned Emotiva Professional brand, which was to be targeted to customer installers. Those plans were shelved once Jade found that Sherbourn was open to a purchase. Jade will “continue to grow Sherbourn’s presence in the custom market while redirecting the Pro name for a different sales channel,” added Fred Hartman, Jade’s director of OEM/ODM sales.

Jim Hardiman has been named engineering VP for The AVC Group (www.theavcgroup.com), marketers of the Elan,
Niles, Xantech, Sunfire, and Aton brands. A 35-year engineering and product development veteran, Hardiman comes to The AVC Group from Harman International, where he served as engineering VP from 2005 until 2008 and then as consumer global engineering VP. Prior to this, from 2000 until 2005, he served as hardware engineering VP at ThinkEngine Networks, advanced development director at Media 100, as well as engineering and product development posts at Data Translation, Digital Television Imagery, Integral Data Systems, and Data General.

An active member of AES, AVB, China Professionals, and the HDTV Group, among others, Jim Hardiman is the recipient of three US patents in the area of video compression and decompression and a 2000 Emmy for Television Sciences awarded by the National Academy of Television Arts and Sciences for the pioneering development of full-motion broadcast-quality PC video and compression plug-in cards utilized in the manufacture of nonlinear editing systems or video servers. Bob Farinelli, who had served as chief technology officer of The AVC Group and previously as President of ELAN Home Systems, is retiring, but will remain with the Group as a consultant.

THX Ltd. (www.thx.com) demonstrated at this year’s CES a horizontal single-enclosure speaker that puts the stereo sweet spot in every chair in the room. The THX

**PHOTO 1: AVC Group’s New CTO Jim Hardiman.**

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Steerable Line Array technology, which the company could decide to license, uses digital signal processing (DSP) and other techniques to produce “multiple unique sweet spots at the same time so everyone can enjoy content at the same time no matter where they are sitting in the room.” The technology will be demonstrated in a concept product at the company’s private suite at the Renaissance Hotel. The concept system that THX demonstrated delivers left and right channels from 92 tiny drivers in a line array in an enclosure with only about a cubic foot of internal volume. DSP is applied to direct multiple beams of sound to any part of the room, enabling every seat in the room to become “the best seat in the house,” the company said. The technology is not dependent on reflecting sound waves off walls, according to THX senior VP Laurie Fincham.

The concept speaker is 10″ high × 82″ wide × 4″ deep and features an outboard amplifier/DSP module that, if it were embedded inside the enclosure, would add only about an eighth of an inch to the enclosure’s depth. Frequency response is 30Hz-20kHz with sound pressure levels of well over 100dB. The concept speaker will steer sound to produce eight sweet spots in the room, but if higher processing power were used, the technology could produce more simultaneous sweet spots. Because of its scalability, the technology can be used to produce smaller or larger enclosures with as few as 25 drivers or as many as 100, depending on the desired sound levels and low-frequency cutoff. This could be as little as one liter of total volume or equivalent to a 4″ cube. The bottom line is that the enclosure is small and takes up considerably less space than existing systems.

A Steerable Line Array stereo system can be made so unobtrusive that it can disappear leaving only the music. The system’s low-profile analog amplifier delivers “traditional audiophile quality” with “modern requirements for the highest energy efficiency.” The technology could be designed into two vertically oriented towers in lieu of one horizontal speaker to deliver the same effects, according to Mr. Fincham. The technology could also be used in two horizontal speakers, one for the front of the room and one for the back, to deliver multichannel surround sound to multiple sweet spots in a room, he added.

In the THX demo speaker, tweeters are positioned on the front panel and fire forward. Low-frequency drivers are mounted inside the enclosure at a 90° angle to the tweeters, firing into a front-panel slot running up and down the face of the enclosure. Each driver is powered by its own analog amplifier.

The technology is based on general principles outlined in an Audio Engineering Society paper published by Fincham and Peter Brown of THX. “With steering there are two aspects that technologies need to address,” Fincham added. “One is the steering of sound to one or more listening locations, and two is controlling beam width. Our system handles both these aspects at the same time. We can illuminate many listening locations, and we can control beam direction.”

In 2008, a UK-based company called Airsound (www.airsound.com) unveiled technology that promised a room-wide sweet spot delivered by a single-enclosure speaker.
Other companies use DSP in speakers to steer the stereo sweet spot to a particular location to compensate for poor speaker placement but not to deliver a sweet spot to every seat in the house. Other companies, such as technology developer Focus, use DSP to steer a surround-sound sweet spot to a specific location in a room.

The pace of single-family housing starts presents a mixed picture for custom integrators. Single-family housing starts trailed off at the end of 2010, but the year nonetheless turned out slightly ahead of 2009’s record low, Census Bureau statistics show. Based on preliminary December statistics, the number of single-family housing starts for calendar 2010 rose 5.8% to 470,900 following a disastrous 28.4% decline in 2009 to 445,100 units, the statistics show. Despite the year’s gain, the numbers were at their lowest point in the 51 years that the Census Bureau began collecting statistics. And they weren’t much better than the 325,000 pace recorded by the US Department of Labor in 1945 during World War II.

In December 2010, the seasonally adjusted annualized rate of housing starts slipped to 417,000 following November’s 458,000 annualized rate. The year started out much stronger, thanks to federal home-purchase tax credits that expired in the spring. Annualized rates peaked at 563,000 in April and fell to a range of 433,000 to 459,000 in the following months through November.

The National Association of Home Builders (www.nahb.org) forecasts that in 2011 new single-family construction will accelerate, experiencing 21.1% growth to 575,000 units, followed in 2012 by a 49.6% gain to 860,000. The 2012 numbers, nonetheless, will still be well below 2005’s peak of 1,715,800 units as reported by the Census Bureau. If NAHB’s forecast for 2010 is any measure, however, the association might be overly optimistic. This time last year, NAHB forecast a calendar-2010 gain of 34.9% to 600,000, but the actual numbers turned out to be 470,900, a gain of only 5.8%. NAHB’s 2009 forecast, however, hit the mark. The association forecast a 25.9% drop to 460,000, and the final Census Bureau statistics put the number at 445,100, down 28.4%.

DTS (www.dts.com) is launching Neo:X post-processing surround-sound technology, promoted as the first technology to upmix stereo and multi-channel audio programs to as many as 11.1 channels. DTS Neo:X adds a pair of front-height speakers and a pair of front-wide speakers to a traditional 5.1-channel or 7.1-channel surround-sound speaker system. The first AV receivers and preamp-processors incorporating the technology could hit the market as soon as the second quarter of 2011.

The front-height speakers “bring discrete effects to the vertical dimension,” enabling an aircraft to seem as if it’s flying overhead, DTS said. The front-height speakers also “elevate ambient sounds,” such as wind, thunder, background music, public address systems, and the like. The front-wide speakers, DTS continued, widen the front sound-stage image while also providing “smooth and seamless tracking of front-to-side actions,” such as the sound of a car moving from the front to the left side of the screen. Though the
Neo:X matrix-upmixing technology will work its magic on existing 2-, 5.1-, and 7.1-channel soundtracks, DTS said movie studios could also produce Neo:X-optimized soundtracks. Studios would be able to produce directional cues that could be heard only through front-height and front-wide speaker channels with no audible leakage to other speakers. The soundtracks would be compatible with standard 5.1- and 7.1-channel home theater systems.

Although it’s possible for any DTS, Dolby, or PCM soundtrack to incorporate the additional cues, to get the best effects out of it, you should use the DTS-HD MA 7.1 [codec]. As a post-processing technology, Neo:X is promoted as upconverting 2.0-, 5.1-, 6.1-, and 7.1-channel soundtracks to 9.1 or 11.1 channels. The technology also features cinema, music, and game modes. Cinema mode is designed to deliver a clear center channel with dialog enhancement and ambient cues for immersive effects. Music mode delivers enhanced immersion in a recorded environment, and game mode provides strong directionality for an interactive experience.

DTS’s demo is not the company’s first demo of a post-processing technology that upmixes two- and multi-channel soundtracks to 11.1 channels. At 2009’s CES, the company demonstrated an 11.1-channel technology that it did not bring to market. That technology, unnamed but part of the company’s Neo technology family, added front-height channels to a traditional 5.1- or 7.1-channel system and could also be used to add an extra pair of surround speakers to a 7.1 system. A system using all 11.1 channels would feature six surround speakers, two front-height speakers, and the traditional front-left, -center, and -right speakers.

For its part, Audyssey Laboratories (www.audyssey.com) already offers Dynamic Surround Expansion (DSX) post-processing technology, which adds front-height speakers and a pair of image-widening front speakers to a traditional 5.1-speaker setup to produce a system with up to 9.1 channels. The technology has been available in select AV receivers since 2009.

In its promotional messages to generate future growth, AudioControl (awww.audiocontrol.com) encourages a grassroots movement within the autosound aftermarket to refocus on audio performance. As a result, the company has developed the “Make Better Sound” slogan and logo that it is offering without copyright fees to retailers and suppliers at CES for use in print, web, and broadcast ads. The intent is to “invite autosound enthusiasts to rediscover their audio roots,” said President Tom Walker. The Make Better Sound campaign encourages mobile electronics specialists to demonstrate and educate their customers in achieving better audio performance. According to Walker, part of the problem is that much of the audio industry’s focus has turned to convenience in recent years. “Great sounding car audio systems leave a lasting impression with their owners,” he continued. “Ultimately, happy customers show off their systems to their friends, who in many cases become enthusiasts themselves.”

International CES show attendance was not so bad this year. More than 140,000 industry professionals attended, according to the show’s owner and producer, the Consumer
Electronics Association (CEA, www.ce.org). The show, which ran from Jan. 6-9, drew more than 2,700 technology companies across the globe and set several new records, including 30,000 international attendees and 22 top CEOs participating in keynotes. CEA also reported that CES attracted more than 80 international delegations. CEA conducts an independent audit of attendance at the International CES, and final verified figures will be available in the spring.

At show close, NAMM (National Association of Musical Merchants, www.namm.org) reported 90,114 registered attendees, a 3% increase from last year and representing a new attendance record for the 109-year-old show. International registration also experienced a 2% increase from last year to 10,400. Another sign of economic recovery in the industry, the association reported 1,417 exhibitors at this year’s show, including 247 new exhibitors.

This year’s CEDIA EXPO (www.cedia.net) drew more than 20,700 attendees to the Georgia World Congress Center in Atlanta September 22–26 for the residential electronic systems industry’s top trade show and training event. The event included 453 total exhibitors, an increase of 6% over 2009. Of those exhibitors, 90 were making their first appearance. The trade show covered a total of 232,515 net sq. ft. of exhibit space.

And last, the 129th AES Convention, an important but much smaller convention/show, had over 14,000 attendees and more than 300 exhibitors crowded the Exhibition Hall, Workshops, Tech Tours, Panels, Platinum, Live Sound, and Special Events. Things seem to be cautiously better for the industry.

The consumer electronics industry will reach a new industry peak in 2011, with revenues exceeding $186 billion, according to the semiannual industry forecast released by CEA. Industry revenues also had a stronger than anticipated 2010, growing 6%. CEA president/CEO Gary Shapiro announced the forecast in his opening remarks at International CES. Total CE industry revenues rebounded last year with growth that doubled July 2010 predictions.

The industry will end 2010 with 6% growth to $180 billion. The industry will continue to see positive growth in 2011, with revenues growing more than 3% and reaching a new industry high of $186.4 billion.

Innovative new products, such as tablets, e-readers, and smartphones, helped spur consumer interest and brought stronger-than-expected growth throughout the year. PC sales led the way in 2010, as the category became the industry’s primary revenue driver for the first time. Led by mobile computing, shipment revenues for personal computers increased 34% in 2010 to $29 billion, more than 16% of overall industry revenues. The category will continue to grow in 2011, with nearly 59 million units being shipped to dealers and revenues of $32 billion projected. Within the personal computer category, mobile computing, especially tablets, saw strong growth in 2010, with revenues climbing 35% to more than $21 billion. Tablets represent a little less than a third of all mobile computing revenues in 2010 and will claim a 36% share of shipment dollars in the category in 2011.

CE sales rose a tepid 1.2% at retail this holiday season, lagging other consumer product sectors. According to MasterCard Advisors’ SpendingPulse report, total retail sales rose 5.5% from Nov. 5 to Dec. 24, led by a 15.4% spike in e-commerce sales and buoyed by such categories as apparel and jewelry. In contrast, CE “was one of the lagging performers,” MasterCard said, attributing flat to modest growth rates throughout the holiday season to the decline in TV prices. SpendingPulse sales data includes national retail and services sale, and are based on aggregate sales activity in the MasterCard payments network, coupled with survey-based estimates for all other payment forms, including cash, check, and other credit cards.

A separate report, by the International Council of Shopping Centers (ICSC) and Goldman Sachs, projects that chain store sales rose better than 4% for the November-December period, representing the best showing since 2006. The research partners project an increase of about 3.5% for December, and recorded a 4.8% spike the week leading up to Christmas Day, their strongest rate since April 24, 2010. VC

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