



Duff McKagan (left) and Alice Cooper, of Hollywood Vampires, performed using Shure KSM8 Dualdyne mics mounted on UHF-R wireless transmitters.

## Sound Developments at the 58th Grammy Awards

By: Mel Lambert

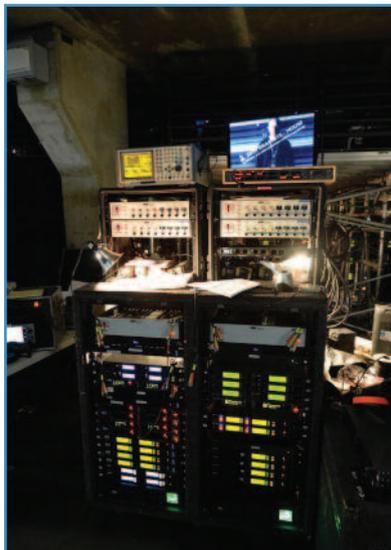
“Music’s Biggest Night” uses new JBL VTX line arrays and all-digital infrastructure

Held once again at the Staples Center in downtown Los Angeles, the 58th annual Grammy Awards broadcast in mid-February on CBS Television attracted a reported viewership of over 24 million people around the world,

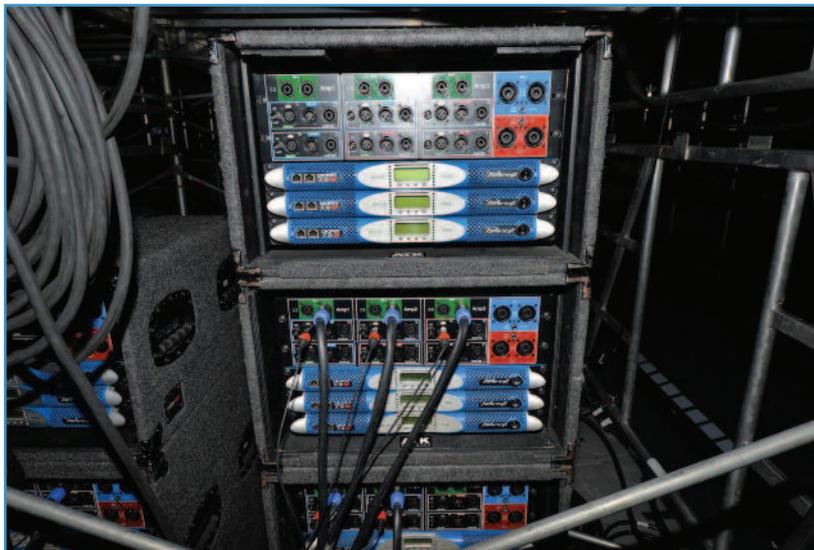
together with a live audience of more than 18,000 music aficionados. The show included Lady Gaga and Nile Rodgers paying tribute to the late David Bowie, Jackson Browne joining with The Eagles to perform a rousing version of “Take It Easy”—a song Browne wrote in 1972 with the band’s co-founder Glenn Frey, who sadly died in January—plus Adele, Alabama Shakes, and Meghan Trainor, who won the Best New Artist award. The Album of the Year award went to 1989, from Taylor Swift, who, in the end, walked off with no fewer than three Grammys, while Record of the Year was awarded to “Uptown Funk,” from Mark Ronson featuring Bruno Mars, and Song of the



The audio splitter rack area, a/k/a “Split World.”



Wireless receiver racks in the RF area.



PA power amplifier racks beneath stage right.

Year to “Thinking Out Loud,” by Ed Sheeran.

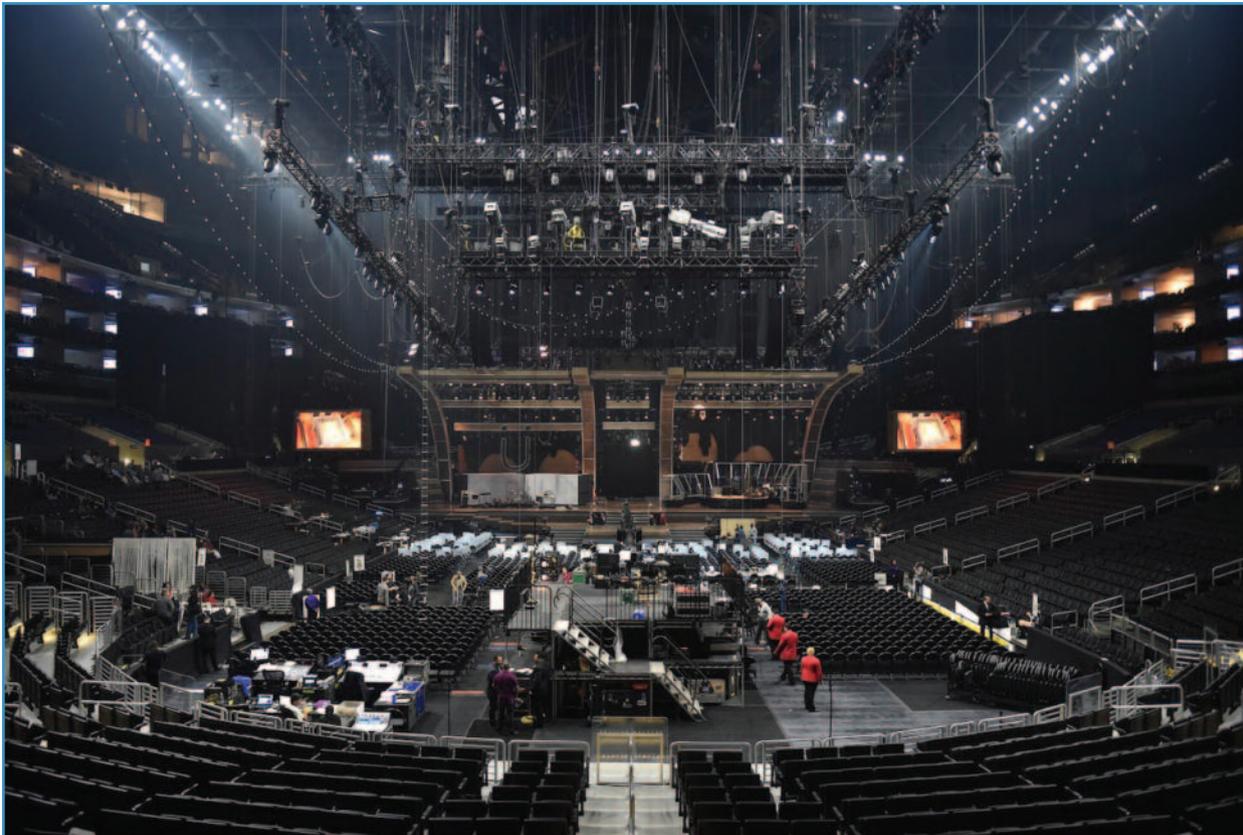
Following a pattern set some 16 years ago, ATK Audiotek provided audio services for the event, including front-of-house and monitor consoles, multiple line arrays, and an all-digital infrastructure. Mix Music Mobile/M3 set up a pair of production trucks to handle music mixing for the TV audience. The three-and-a-half-hour show was hosted once again by LL Cool J.

According to Michael Abbott, the

Grammy Awards’ audio director/coordinator, “Our biggest creative challenge came from the fact that our featured artists often are reluctant to finalize elements leading up to their performances, which causes the audio team to plan for various scenarios. After many years of doing the show, we are used to this ‘creative process.’ We also needed to secure final prerecorded tracks for play-out and synchronize them to the video content.”

## Revitalized sound-reinforcement system

Normally, ATK Audiotek fields four identical hangs of 12 JBL Professional VerTec VT4889 line-array cabinets plus a delay ring comprising two 8-box clusters of JBL VerTec 4889 cabinets, plus 16 VerTec VT4880A subwoofer arrays flown above the stage; last year, because of the rigging requirements, the subwoofers were divided into two 8-box arrays hung on either side of the inner pairs of line-array cabinets.



PA and stage rigging at Staples Center.

“A couple of years ago, we opted to use some of the early prototypes of JBL’s then-new VTX Series systems,” recalls Jeff Peterson, ATK system-design engineer. “This year, with the availability of new-generation versions, we used several VTX V20 and V25 cabinets within the Staples Center, powered by Crown iTech and Powersoft K10 amplification.”

The main left/right clusters comprised 12 JBL VTX V25-II-CS cabinets per side, powered by Crown VRacks with i-TechHD 4x3500 amplifiers, with nine JBL VTX S28 subwoofers per side in cardioid configuration, powered by Crown VRacks with i-TechHD 12000 amps. The left/right outfills comprised 15 JBL VTX V20 cabinets per hang, powered by Crown VRacks with i-TechHD 4x3500 amplifiers, with three delay clusters of eight JBL VTX V20s, powered by similar Crown VRacks. “The 300-level fill comprises six clusters of two ATK C6 three-way cabinets, powered by Powersoft K10-

**“Our biggest creative challenge came from the fact that our featured artists often are reluctant to finalize elements leading up to their performances, which, in turn, causes the audio team to plan for various scenarios. After many years of doing the show, we are used to this ‘creative process’.”** —Abbott

DSP amps,” Peterson adds. “For floor subs, we had four ATK CSW-218 2x18 cabinets and, for front fills, six JBL VRX932 cabinets, four JBL AC26 cabinets, and two JBL VRX928 cabinets.”

The JBL VTX Series line arrays fea-

ture redesigned component drivers, waveguides, and suspension technologies, and are also supported by technologies from Harman Professional sister companies. The V25-II-CS cabinet is a full-size three-way design that features the firm’s D2 dual-diaphragm/dual voice-coil compression driver on a patented suspension system, fourth-generation HF waveguide technology, and a patented RBI (Radiation Boundary Integrator). Aluminum front baffles reduce cabinet height and weight and provide improved heat transfer.

For stage monitoring, ATK supplied 24 channels of Shure PSM1000 IEM transmitters—12 channels per stage—working with 24 channels of PSM600-HW Hardline in-ear packs, together with 12 ATK M5 2x12” and 50 ATK M2C 12” monitor wedges.

At the front of house, for production sound ATK VP of special events Mikael Stewart helmed a DiGiCo SD10 digital console with an SD-RE remote redun-

dant engine, while Grammy regular Ron Reaves handled music mixing on a DiGiCo SD7 console. Once again, Tom Pesa and Michael Parker mixed stage monitors and IEMs for stage right and stage left respectively, using identical DiGiCo SD7 consoles. “We also had an extra DiGiCo S21 console at FOH as backup,” states Peterson. “All eight DiGiCo SD racks were interconnected to the appropriate control surfaces,” and shared on-stage preamps and five-way 56-pair splitters via fiber links.

“For interconnects, we used two Optocore DD4MR-FX fiber drive systems that accept MADI I/O and sync from the DiGiCo consoles,” Peterson continues. “These connected to three amplifier positions—house-left, house-right, and the flown delays—each of which had two Optocore DD32R-FX AES I/O units feeding primary and redundant AES signals to all power amps. In the event of a failure, the fiber system would switch automatically between consoles and feeds; the amplifiers would also switch automatically between primary and redundant sources in the event of a signal loss. All in all, we used 9,000’ of fiber to connect the 15 clusters, 124 PA speakers, and 756kW of PA amplification.”

Peterson tuned the system using Rational Acoustics Smaart 7 acoustic measurement tools, Roland Studio-Capture preamp/USB interface, and Earthworks reference microphones. Loudspeaker control and processing was via Powersoft’s Armonia DSP system.

“The Staples Center was built as a sports venue as much as a concert arena,” Stewart advises, “and it never changes acoustically or structurally. Therefore the tuning and sonic adjustments we made were based on the scenic design. We were never concerned about a Powersoft failure; they have proven to be extremely reliable. Powersoft is a very smooth-sounding amp.”



Co-broadcast music mixer John Harris in the M3 Eclipse truck.



Broadcast production mixer Thomas Holmes in the Denali Audio truck.

“Being right in front of the PA, the satellite stage—which we refer to as ‘The Dish’—always presents a challenge,” Reaves acknowledges. “Being primarily a mixer for television shows, I’ve gotten used to having performers in front of the speakers, but that doesn’t make it any easier to achieve gain before feedback. A lot of careful equalization—and some intense fader riding!—go into making those performances satisfying in the house, while not interfering with the TV mix, which, of course, is the primary concern. It’s

another one of those things that’s a good idea from a scenic point of view, but not so much from an audio point of view!”

The new ATK rig “sounded great to my ears,” says Reaves. “The JBL VTX cabinets with the new waveguides really add a new ‘depth of field,’ and are fast and accurate. We had several people who have been with this show for many years comment on the improvement in intelligibility and ‘crispness’ of the mix.”

“Yes,” agrees Stewart, “the sys-



Tori Kelly also performed with a KSM8/UHF-R combination.

tem's top-end performance was definitely smoother and more accurate. Using the VT20 boxes as side and delay coverage was far more convenient, and allowed us more control; it is an exceptional enclosure! A major change in the set design meant that the presenter/winner position was moved 15' downstage, with the seated audience placed upstage of this location. Transitioning from lead performances into dialogue is always a challenge, and will continue to be."

"Creating so many discrete ear and wedge mixes is time-consuming," Pesa states, "but the DiGiCo SD7 and my usual templates, which offered customization for each artist, helped immensely. When you're able to offer so much processing, dynamics, etc.—all instantly available—things move much more quickly. Having built great working relationships with many of the Grammy acts' mix engineers, that mutual trust allows me to pre-dial and get a snapshot built based on what I know about them, their artists, and also the special environment that the 'one-off' Grammy performance entails. James Bay's monitor engineer, Marc Graham, is fond of the SEQ dynamic

EQ for James' vocal, and it really sounded great. We all listen and learn, and that is what makes a show of this caliber truly great to be around."

### New mixing and monitor technologies for live broadcast music mix

Technologies within the pair of Mix Music Mobile/M3 trucks—Eclipse, based on the East Coast, and Horizon, based in Los Angeles—have also undergone some dramatic changes. A pair of identical Lawo MC<sup>2</sup>56 digital consoles with 48-fader control surfaces was used to prepare a 5.1-channel music mix from the live performances, with outputs passing to the NEP Denali Summit AV truck, where they were combined by production mixer Tom Holms with announcer and pre-recorded sources to develop the surround-sound broadcast mix for CBS Television in New York. During rehearsals and the live broadcast, the show's music mixers—John Harris and Eric Schilling—alternated in the Eclipse hot seat; during down time, the mixers moved to the second, identically-equipped M3 truck, where they refined their static levels, pans, EQ,

and dynamics settings using multi-channel Avid Pro Tools recordings. During the show, these automation parameters were recalled between numbers and were available as starting points for the live music mixes. The Lawo consoles replaced a pair of identical Avid ICON D-Control surfaces.

The 48-fader Lawo consoles utilize fully redundant processing cores with local I/O boxes; a built-in 8,196-by-8,196 audio router is featured, together with Ravenna/AES67 compliance. "The decision to go with Lawo was a natural one for us," states Joel Singer, M3's engineer in charge, and responsible for systems design. "These new consoles sound much more 'open' than what we were using before," and offer enhanced flexibility and reliability.

"We looked at other console designs to replace our eight year-old [Digidesign] Icon consoles, including the new Avid S6Live, which is not broadcast-friendly," Singer says. "Nothing else looked appropriate. These Lawo consoles, which have been proven in sports broadcasting, will offer us an eight-to-ten-year life span." The operation has also upgraded with a Waves SoundGrid Extreme server, along with a DiGiGrid MGO optical MADI interface to accommodate MADI inserts for the Lawo I/O system via the SoundGrid network, which is said to handle multiple Waves and third-party SoundGrid-compatible plug-ins with ultra-low latency.

"The first benefit of using a Waves MultiRack plug-in host with our Lawo consoles is that we have instant access to the Waves plug-ins that everyone is used to," Singer states. "John Harris and Eric Schilling are accustomed to the plug-ins they used with the Avid setup, so they are our go-to plugs," ranging from the Waves CLA-76 compressor/limiter, Renaissance compressor, and Renaissance Vox to the H-Reverb and IR1 Convolution reverb. "They are used to controlling system parameters; being able to run [Waves plug-ins]

directly on the Lawo console is an added benefit because now the work flow is so much faster, with a unified, fully integrated system. We can use either the Lawo touch screen to control parameters for the Waves plugs, or use a mouse or trackball.

“It’s also a matter of what we gain in operational speed and integrity. Since console, router, and Waves snapshot recall happens at the press of a button, the work flow for live broadcast events is greatly increased. While the Avid work flow was good, we had to surround it with external routers, etc., which we tried not to adjust during live shows, since it would have meant multiple recalls from different systems.”

According to Singer, Waves H-Reverbs figured prominently. “We use it in a mono-in/5.0-out surround configuration,” he explains. “That way, we’re able to create a space for vocals and instruments; the Staples Center sounds great, but it’s not the type of ambiance you would want on a vocal or on certain instruments. We use two instances to create different types of 5.0 reverb returns, which fill out the entire surround infrastructure. We also use the Waves CLA-76 Renaissance Compressor and Renaissance DeEsser on vocals, to level them and keep it where the engineer and artist are happy. The CLA76 offers the same sound to the legendary [Universal Audio] 1176LN compressor limiter.”

“As always, my biggest challenge during the Grammy broadcast was to keep my artistic hat squarely on my head,” co-mixer Harris considers. “I



Playback mixer Eric Johnson.

**“Being primarily a mixer for television shows, I’ve gotten used to having performers in front of the speakers, but that doesn’t make it any easier to achieve gain before feedback. A lot of careful equalization—and some intense fader riding—go into making those performances satisfying in the house, while not interfering with the TV mix, which, of course, is the primary concern. It’s another one of those things that’s a good idea from a scenic point of view, but not so much from an audio point of view.”** — Reaves

need to serve the artists as best I can; the Lawo console sounded great and performed perfectly. The on-board EQs and compressors are musical, with all the advantages of a soft surface and traditional design; because I

could also use Waves Grid, I had the best of all worlds. The integration of Lawo engineering with Waves provided super-friendly custom layers with great ergonomics. Console and Waves snapshots were easy to manage and

d3 r13 is here: refreshed UI • HMSF timeline • same workflow

track 1 Start: +00:00:00.00 End: 00:09:20.00

Group

Video

Video 2

00:00:00.00 00:00:15.00 00:00:30.00 00:00:45.00 00:01:00.00 00:01:15.00 00:01:30.00 00:01:45.00

See r13 at InfoComm 2016, 4-10 June, Las Vegas, #C6248  
[d3technologies.com/r13](http://d3technologies.com/r13)



The front-of-house audio crew.

bulletproof. I used the same plug-ins I always have on vocals, etc.—it is more about my palette than a commercial mimic, but complex vocal effects and such were no problem, and always instantly recallable.”

In addition to new acoustical treatment and tuning, courtesy of Audio

Design International, the two M3 trucks now feature an M&K Sound 5.1-channel system that comprises MPS-2510P for the left, center, and right channels, MPS-1611P for the surrounds and two X10 subwoofers; processing is handled in a Meyer Sound Galileo unit. “Ninety percent of

our shows are mixed by M3 engineers—John Harris and Jay Vicari—so finding a new speaker system for them to use during this retrofit was a task,” Singer explains. “With all these top-end speaker systems, you’re comparing Ferraris. It comes down to whether you like the red one or the yellow one,

# Look Solutions

Fog machines made in Germany

## EFFICIENT!

**SMALL  
RELIABLE  
Fog & Haze Machines**



# UNIQUE<sup>21</sup> [HAZER]

EXHIBITING AT  
**infoComm16**  
BOOTH 3053

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

[usa@looksolutions.com](mailto:usa@looksolutions.com)

1-800-426-4189

and John and Jay choose yellow.” All M3 mobile trucks are now equipped with M&K Sound monitors.

Sound for the segment that featured the cast of *Hamilton* performing the hip-hop musical’s opening song “Alexander Hamilton” from the Richard Rogers Theatre in New York was mixed by Vicari aboard M3’s Voyager mobile truck, and delivered with HD video to the Staples Center by satellite link; the broadcast mixer was Fritz Lang, who worked aboard All Mobile Video’s Titan AV truck. *Hamilton* is the eighth musical cast to perform at the Grammy Awards, and it was only the fourth time that the telecast has featured a live performance via satellite.

“The audio mix was delivered as a 5.1 discrete embedded feed via fiber from NYC,” M3’s Singer explains. “Jay [Vicari] is familiar with the sound field that Grammy mixers use for the live broadcast; having him in New York was a real bonus, because he has the same audio sensibilities as John Harris and Eric Schilling.”

### Wired and RF microphone selections

Once again, Audio-Technica, Sennheiser, and Shure supplied a variety of wired and wireless microphone systems for the awards show.

During the show’s opening song, “Out of the Woods,” Taylor Swift used a Sennheiser Digital 9000 system. Lady Gaga, who charged through an electrifying medley of David Bowie songs taken from various stages of the artist’s career—including the songs “Space Oddity,” “Ziggy Stardust,” and “Heroes”—used a Sennheiser SKM-5200 handheld transmitter coupled with an MD-5235 capsule. “During Lady Gaga’s six-minute segment,” recalls the artist’s monitor engineer, James Corbin, “we used three different microphones: all SKM-5200/MD-5235 combinations. Under normal circumstances, this would be a real challenge, because most matched capsules from other microphone manufacturers rarely sound the same. But the



Lady Gaga used three different microphones: all Sennheiser SKM-5200 handheld transmitters coupled with MD-5235 capsules.

MD-5232 capsules sound identical, which meant I was able to get the sound I wanted in soundcheck with one of them, and literally cut and paste the EQ settings across the other two mics.”

The Weeknd, nominated for seven Grammy Awards, used an SKM-

5200/MD-5235 transmitter/capsule combination. “Our Sennheiser mics delivered crisp and detailed audio throughout the evening,” says front-of-house mixer Reaves. “I am particularly fond of the MD-5235 capsule, since it handles proximity very well and is also very responsive across the entire

dynamic range.”

Some 65 channels of RF mics—50 main receivers and 15 more for the backline—plus 37 channels of IEMs were wrangled by Dave Bellamy, from Burbank-based Soundtronics Wireless. “The most important thing for me is that the equipment is reliable,” he stresses. “It has to be something I don’t need to think or worry about. Since we have a substantial amount of Sennheiser equipment in our inventory, my confidence in the product speaks for itself.”

LL Cool J used the new Shure KSM8 Dualdyne microphone mounted on a UHF-R wireless transmitter, which was brought in for consideration at the suggestion of audio coordinator Abbott. “I’ve been using the KSM8 on *The Voice* for host Carson Daly with excellent results,” he states. “The reduced proximity effect and flat response gave us a smooth sound, making it an ideal choice for LL Cool J.”

The KSM8 was also the mic capsule of choice for UHF-R transmitters used by Tori Kelly in her duet with James Bay, Johnny Depp, and Duff McKagan from Hollywood Vampires, and three members of Little Big Town for their hit song, “Girl Crush.” “I was very pleased with Little Big Town’s vocal mic choice,” says Schilling. “The KSM8 has a very natural sound and requires very little EQ to make it work.”

Shure Axient AXT200 handheld transmitters were utilized for lead vocals by Justin Bieber, using a KSM9HS capsule, and Alabama Shakes with an SM58 capsule. In addition, for the second straight year the production team designated an Axient handheld with an SM58 capsule as its global spare wireless.

Now in its 50th year of production, the classic Shure SM58 capsule was used with several UHF-R handhelds during the Lionel Richie tribute, including microphones for Demi Lovato, Luke Bryan, Meghan Trainor, Tyrese,

and Richie himself. Hardwired SM58s were used for all backing vocals by The Eagles during their Glenn Frey tribute, and by both Gary Clark, Jr. and Best New Artist winner Chris Stapleton during the B. B. King tribute segment.

All wireless in-ear systems were Shure PSM-1000 units, supplied by ATK Audiotek. “Five years and counting, PSM-1000 is still going strong with a zero failure rate,” stresses Parker.

*Mel Lambert has been intimately involved with production industries on both sides of the Atlantic for more years than he cares to remember. He is principal of Content Creators, a Los Angeles-based copywriting and editorial service, and can be reached at [mel.lambert@content-creators.com](mailto:mel.lambert@content-creators.com); 818.558-3924. He is also a 30-year member of the UK’s National Union of Journalists.*

## People & Products Connecting the World of Entertainment



- Signal and Data Cables
- Transformer Iso Split Snakes
- Hybrid Interconnect Solutions
- Stage Boxes and Cables
- DGLink Ruggedized Ethernet Switches
- DGLink Multi-Protocol Stage Boxes
- Custom Power Distribution



[www.linkusa-inc.com](http://www.linkusa-inc.com)  
855-433-LINK (5465)

**infoComm16**

Las Vegas, NV June 8-10, 2016 | Booth #C11416