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L.A. Grapevine

By Maureen Droney

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An up-close view of ICT's technology, built to simulate technologies used to train American troops

Photo: Courtesy USC ICT

I'm not a roller coaster fan. Get me on a Big Dipper and I'll white-knuckle the bar and hyperventilate for the duration. For the most part, I'll also keep my eyes squinched shut, risking only occasional peeks at the scary climbs and drops. Which is exactly what I did at the Institute for Creative Technology's (www.ict.usc.edu) Virtual Reality Theatre during the roller coaster portion of a film demonstrating ICT's VistaRama technology. It was, sonically and visually, a truly amazing ride.

I met with Dr. Chris Kyriakakis, director of the University of Southern California's (USC) Immersive Audio Laboratory, and his team, including sound designer David Miraglia and sound programmer Ramy Sadek, who provided a glimpse into the audio portion of a rather extraordinary joint venture.

Launched in 1999, ICT is a partnership between the U.S. Army and USC to develop advanced modeling and simulation technologies to train American troops for 21st-century missions. ICT is also tapping resources from the Hollywood and video gaming communities. The ultimate goals: to create experiences so real that "your heart rate goes up and you actually perspire" and to provide a safer and cheaper supplement to large-scale military exercises.

Scientific exploration often yields consumer goods; after all, Corning Ware and Tang were byproducts of the 1960s space program. In the case of the ICT audio department, its significant exploration into surround sound may just provide some impetus — and some pretty cool software — for the professional and consumer audiophile.

According to Kyriakakis, immersive audio is a family of technologies related to capturing and rendering sound. The lab, located at USC's main campus, focuses on aspects of sound signal processing: how it's simulated and perceived, how microphone arrays capture sound direction and how going beyond 5.1-channel surround enhances the experience. One of Kyriakakis' colleagues in this work, also a USC professor, is Tomlinson Holman, best known as THX's longtime technical director.

A main focus of the group's work is 10.2 surround. "Why 10.2? What's wrong with 5.1?" asks Kyriakakis rhetorically. "5.1 was an afterthought for movies. The format wasn't based on human perception or requirements, but on the space left over after the picture on the physical film.

"The decision of how to use the available channels was correct," he continues. "Human perception, in terms of differentiating direction, is better in the front. If you're going to have five channels, three in the front and two in the back make sense. But it falls short as we expand the field of hearing to complete surround. With 5.1, you can't get up and walk around. You also can't have sound travel seamlessly from, say, front-left to rear surround-left because there's a big gap right at 90 degrees — the boundary of front and back perception."

The bottom line, states Kyriakakis, is that humans can perceive astronomical numbers of sound channels — theoretically. But in a practical sense, after 10.2, more channels probably have diminishing returns. "Audio today at a



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24-bit sampling rate exceeds the human range of perception," he notes. "And in tests, the farthest frequency I've seen my students be able to hear is 24 kHz. So even given that you want to make sure filters work correctly, you really don't need much more than 48 kHz. Our point is, don't eat up the space available with things that don't make a difference. Eat it up with more channels!"

Keeping the basic 5.1 front setup of left and right at 30 degrees, 10.2 adds left and right wide channels at 60 degrees to increase lateral reflection, making with the center channel five channels across the front. The surrounds at 110 degrees remain the same as in 5.1. A back surround channel equals eight channels in the horizontal plane. Add two "height" channels — as high as possible in the room — and you've got 10. Splitting the subs (the lows from the speakers on one side to one sub and from the speakers on the other side to the other sub) makes 10.2.

The 10.2 surround system at ICT is remarkable. The integrity of mixes, unlike with 5.1, was maintained even when I walked around the room. I listened "outside the box" to a 10.2 version of a Shakespeare play, some Herbie Hancock mixes and particularly enjoyed the opportunity to experience Handel's Messiah from different perspectives in an auditorium. The team also hooked me up with a head mount so I could stumble my way through an interactive, immersive army-training scenario. That was intense. The scene changed as I walked and turned my head, and sonic cues were a huge part of the experience.

The team is working on a patent-pending method of synthesizing and filtering sounds to re-create different acoustic environments for multichannel playback and panning, and systems that, triggering from 3-D graphic coordinates, drive sounds over 10 channels of audio.



The Wizardz of Oz are Liz Hooper (l) and Andrew Bojanic—transplants from Australia
 Photo: Maureen Droney

When I turned off of busy Woodman Avenue onto a charming tree-lined Sherman Oaks side street, it actually seemed a bit like small-town Kansas. But as it turns out, I was projecting in the wrong direction. There to visit up-and-coming production team The Wizardz of Oz (aka Andrew Bojanic and Liz Hooper, www.worldsend.com/wizardz.html), I soon learned that "Oz," in this case, actually refers to their native Australia.

A dynamic duo with an infectious upbeat attitude, the Wizardz are a fun hang, an attribute that the artists they work with seem

to appreciate. It's a diverse group: In their two years in L.A., they've amassed production credits with the soulful Keaton Simons (whose single, "Currently," from the EP of the same name, is garnering major buzz in L.A.), co-writing a song for Ricky Martin, production for Maverick's Lillix, Elektra's The Troys, Sony Columbia's dance hall artist Triniti and (with fellow Aussie Charles Fisher) on Olivia Newton-John's **Duets**, as well as a TV theme for an upcoming Nickelodeon/MTV program.

The Wizardz had already paid a goodly chunk of dues Down Under, where, together and separately, they gigged in a succession of bands while hustling writing and production work on the side. They're multitasking: Bojanic plays guitar and keyboards and is a programmer and recording engineer; and Hooper, a vocalist who plays keyboards, bass and violin, has a degree in jazz.

It was respected Los Angeles-based manager Sandy Robertson who advised that writing and producing for others was the path to focus on. "We sent him some songs he liked and it was, 'Drop what you're doing. I've got some ideas for you,'" recalls Hooper. "It was great because we'd always wanted to come to L.A."

It was also Robertson who, upon their arrival, hooked them up with red-hot producers The Matrix (Avril Lavigne, Christina Aguilera, Liz Phair), who put the Wizardz to work. "Andrew started programming for The Matrix, I did a lot of backing vocals and we did some co-writes — all the odds and ends that needed doing," explains Hooper. "It snowballed from there."

"It's a funny thing about Australia," muses Bojanic. "There's amazing talent there, but no real support network. That's why so many Australian artists are being signed by American labels. You basically have to go there, find them and bring them back here. Australia is a great place to nurture talent, but there's no way to get to the next level."

"The population is so small that it only takes 75,000 units to go Platinum," Hooper points out. "Most of the live music gets performed in pubs. If you're a struggling R&B or hip hop artist, there's no method of getting your music out there."

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Now, with credits under their belt and a publishing deal with The Matrix/BMG, the Wizardz are developing talent on their own, co-writing and/or producing for Arkansan neo-soul vocalist Ivy Levan, 16-year-old pop singer Angel Faith, L.A. teens the Valli Girls and OC hard-rockers Dumb Luck, among others.

Pro Tools 5.0 suits their composing and recording needs; Hooper edits with an Mbox and Pro Tools LE system. Upgrading to HD will have to wait as they've been collecting guitars instead, including some recommended by friend Matt Ferguson at Gibson. "It's what goes into the box that counts," states Bojanic. "We've been spending money on great guitars, good amps and some vintage API outboard."

A favorite recording chain is a RØDE (that Aussie thing again!) or a BLUE Bottle mic through an Avalon 737 preamp into an API 525 compressor. Other fave tools are Native Instruments' B4 organ module and Battery drum sampling software. A huge homemade sample library gets plenty of use, but live recording remains at the heart of Wizardry.

"So many artists need somebody in their court to help them be the best that they can," says Bojanic. "Currently, labels can't afford to do very much in the way of developing talent. That's where we fit in. It's what we love to do."

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