



*... dedicated to the promotion, composition, performance, understanding and dissemination of new and contemporary music ...*

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# Entrepreneurship and Innovation in Contemporary Music Culture Music Technology Performance at the University of Central Missouri

by Eric Honour



## Introduction

Across the landscape of music today, many performers use technology of various kinds to extend or augment the capabilities of their instruments. From basic amplification to guitarists' collections of effects pedals, technology supports a great deal of contemporary performance. Beyond equipment designed to extend instruments, however, it is also becoming common to find musicians performing entirely on instruments based in modern technology, such as laptop or turntables.

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THE SCI NEWSLETTER



... dedicated to the promotion, composition, performance, understanding and dissemination of new and contemporary music ...

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**2012 SCI Region VI Conference**  
October 5-6, 2012, West Texas A & M University, Canyon, Texas  
By Matthew Saunders

## About the Newsletter

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## Upcoming SCI Events

### 2015 SCI Region I Conference October 22-24

University of Maine  
Orono, Maine  
Beth Wiemann, Host

### 2015 SCI National Conference November 12-14

The University of Florida School of Music  
Gainesville, Florida  
James Paul Sain, Co-host  
Paul Richards, Co-host

### 2016 SCI Region VI Conference February 11-13

Friends University and Wichita State  
University, Wichita, Kansas  
Dan Racer, Co-host  
Aleks Sternfeld-Dunn, Co-host

### 2016 SCI Region III Conference February 25-27

Marshall University  
Huntington, West Virginia  
Mark Zanter, Host

### 2017 SCI Region VIII Conference Spring 2017

Washington State University  
Pullman, Washington  
Ryan M. Hare, Host



## Internet & Email

[www.societyofcomposers.org](http://www.societyofcomposers.org)

- Conference dates and submission guidelines
- Contact information and links to member web-pages
- Student chapters and opportunities
- CDs and journals produced by SCI
- Details on SCI such as membership, contacts for officers, regional structure, by-laws, newsletter archives and more...

## SCION

SCION is a listing of opportunities on our website exclusively for members. It is updated on a continual basis so that it may be checked at any time for the most current notices. In addition, members are emailed on the first Monday of each month to remind them to visit the site for new or recent postings. The large number of listings is easily managed by a table of contents with links to the individual notices. In-depth coverage; contest listings in full; all items listed until expiration; this is a valuable resource that you may print in its entirety or in part at any time.

John Bilotta, SCION Editor  
[scion@societyofcomposers.org](mailto:scion@societyofcomposers.org)

## scimembers

scimembers is a member-driven e-mail mailing list that is intended to facilitate communication between members of the Society on topics of concern to composers of contemporary concert music. It conveys whatever notices or messages are sent by its members, including announcements of performances and professional opportunities, as well as discussions on a wide variety of topics. For more information, including how to join and participate in the listserv:

<http://www.societyofcomposers.org/publications/listserv.html>

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## Membership Information

For complete details, please visit  
<http://www.societyofcomposers.org/join/membership.html>.

**Full Membership** (\$75/year): Eligible to submit scores to the National Conferences, regional conferences, SCI Recording Series, SCI Journal of Music Scores. Access to the SCI Newsletter in electronic form. Optional subscription to [scimembers], the SCI listserv and all other SCI publications. Eligible to vote on Society Matters and in elections for the National Council.

**Joint Membership** (\$100/year): Same benefits as full members

**Senior Membership** (\$35/year): Open to those 65 years of age or older, or retired. Same benefits as full members.

**Associate Membership** (\$40/year): Open to performers and other interested professionals. Receives the SCI Newsletter in electronic form and can participate in national and regional conferences.

**Student Membership** (\$35/year): Eligible to submit to national and regional conferences and to vote in society matters. Access to all SCI publications.

**Student Chapter Membership** (\$25/year): Same benefits as student members, but only available on campuses having Student Chapters.

**Institutional Membership** (\$40/year): Organizations receive hard copy of the SCI Newsletter and other mailings.

**Lifetime Membership** (\$1400 or \$150/year for 10 years): Benefits the same as full members, for life.

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## Music Technology Performance at the University of Central Missouri

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At annual events like the International Conference on New Interfaces for Musical Expression (NIME) or the International Computer Music Conference (ICMC), developers regularly demonstrate extraordinary new possibilities for performing and creating music via technology. Excitingly, it is becoming easier and easier for people to develop their own performance technologies, to the point where even some grammar school students have begun to experiment with it.

Responding to this evolving landscape, we recently created a new applied area in music technology performance at the University of Central Missouri. In this article, I will provide some background for our decision to take this step, as well as some information about our curriculum. I am very interested in collaborating with faculty at other institutions who are considering starting programs like this one, or who are already teaching technology-based performance in one way or another. Collaboration with composers is an important aspect of work in this area, so I also hope readers will watch for our periodic calls for works involving music technology performance.

### Background

Naturally, the use of contemporaneous technology in musical performance has kept pace with technological developments themselves throughout history. After all, any musical instrument involves technology of one kind or another. Some traditional instruments, like pianos or organs, are truly fantastic mechanical devices. The advent of electrical technology gave rise to a plethora of new instruments in the early 1900s, including the electric guitar, various sorts of synthesizers, and many others.

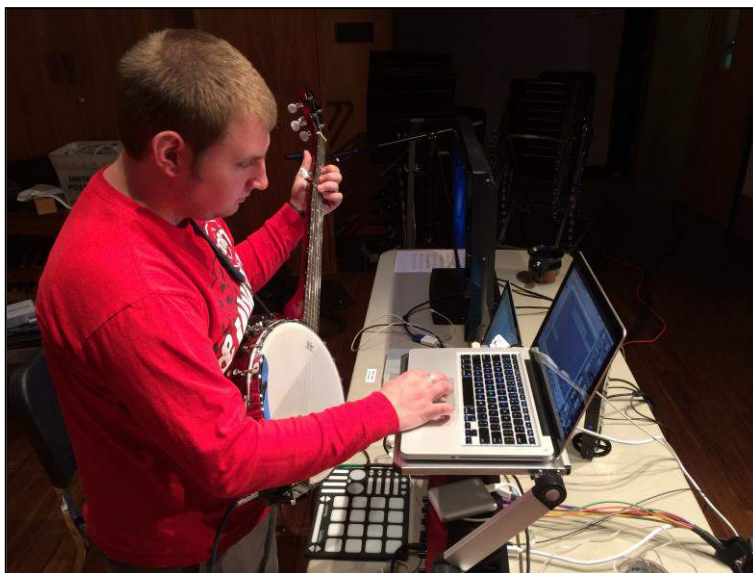
More recent developments in computer technology have led to a very rich, diverse set of instruments incorporating both hardware and software. For the purposes of this article, I will use the term “technology-based instruments” to mean these sorts of instruments, incorporating contemporary technology, never intending disrespect toward instruments designed using older technologies.

### Technology-based Performance in Academia

One can find plenty of examples of performers—even virtuosos—using Theremins or other technology-based instruments from the early twentieth century on. Many people have experimented with technology-based performance within universities as well. However, academia as a whole has been slow to respond to these developments. There are not many degree programs, anywhere in the world, that allow students to study performance on technology-based instruments. Instead, institutions generally require students to study a traditional instrument (or voice). If they address it at all, they relegate the study of making music via technology to the realm of composition.

Composition is a vital part of working with these instruments, in fact—more on that later—but the absence of serious study of technology-based performance in our universities and conservatories is not ideal. It is symptomatic of the rift that exists today between music in higher education and music outside academia, in contemporary society.

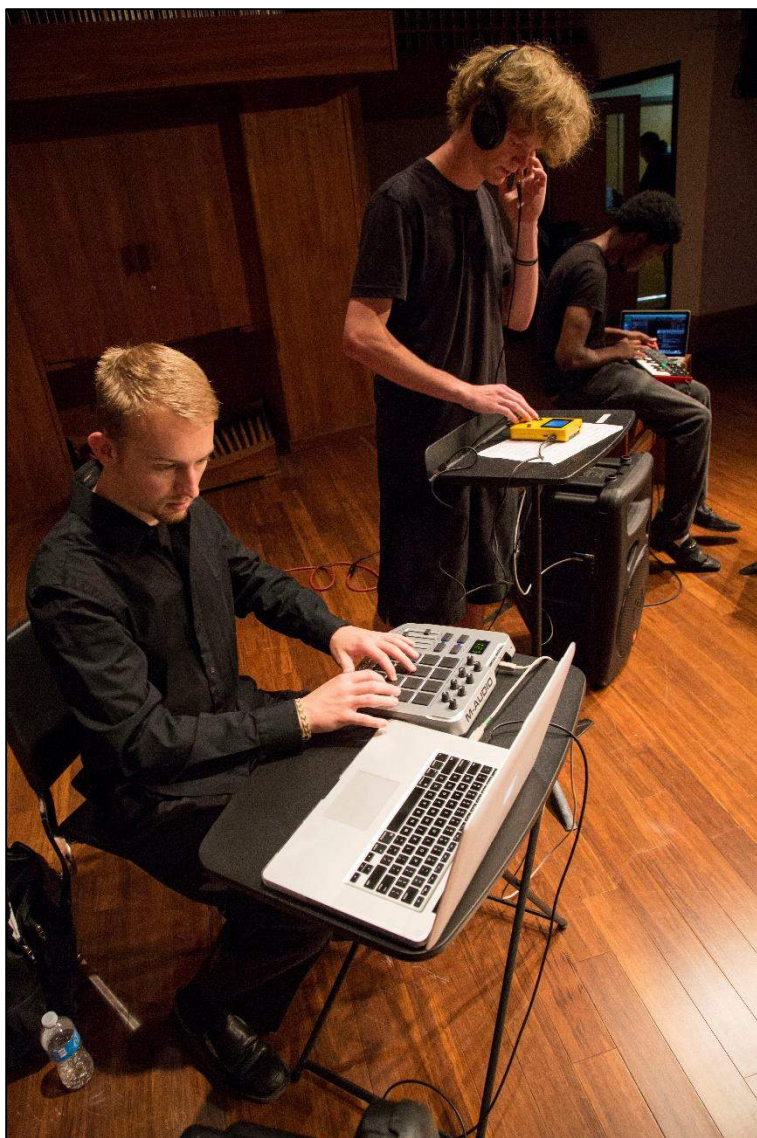
I am pleased to see things beginning to shift: there is significant momentum toward increasing technology-based performance offerings in academia. For example, after their introduction at Princeton and then Stanford, laptop orchestras



have caught on in a big way, and can now be found at many universities around the world. Additionally, a number of institutions, including the University of Southern California and the University of Miami, among others, allow students to study technology-based instruments, after passing an audition on some traditional instrument (or voice), and the University of Oregon recently began offering a doctoral program in Data-Driven Instruments. There are many other examples of institutions beginning to explore the area of live musical performance using modern technology.

### Music Technology at UCM

In 1996, UCM was designated the State of Missouri's lead institution for professional and applied technology education,



which led to the creation of our music technology degree program in 2000. Housed in the department of music at UCM, the program grants a Bachelor of Music in Music Technology degree, and will soon begin offering a Master's degree in the area. From its inception, the focus of the program was audio production, especially recording studio production and live sound reinforcement. Graduates of the program can be found in recording studios across the country, and working on A-list concert tours around the world. As the program has matured and grown, we have developed a strong secondary focus in electroacoustic composition, with all music technology majors required to take course work in composition, Max, sound design, and audio-for-film/game, in addition to their courses in the recording arts.

As with any Bachelor of Music degree, our students must also take music theory, history, piano class, ensembles, and private lessons on some instrument or voice. To be admitted to any music degree at UCM, students must pass an audition and a diagnostic exam in music theory.

### Technology and Performance

The audition requirement frequently surprises prospective music technology students. Many who are interested in studying music technology ask, "but I want to be a producer—why do I need to audition?" I sympathize with the question, especially since I see the equipment in the recording studio as the primary creative instrument of a producer. However, while crafting an excellent recording is certainly an artistic and musical activity, it is not the same as performing live on stage. Further, I believe very firmly in the value of serious performance study as part of any music degree, and as part of the basic training of producers, audio engineers, electroacoustic composers, and other music technologists.

Since the early 2000s, however, technology-based performance has gone mainstream. Starting around 2010, I found that our pool of prospective students was beginning to change. We began turning away large numbers each year who did actually perform music live, but on instruments we did not offer in applied performance studios. Students showed up

regularly who not only produced tracks at home in Logic, FL Studio, or Pro Tools, but who also used MIDI keyboards, MPC-style controllers, turntables, or other technology to perform their music live. With thousands of videos available on YouTube showing people how to incorporate various sorts of technology into their live performances—from basic MIDI controllers to circuit-bending old Speak-and-Spell toys or using a Makey Makey to turn vegetables into MIDI triggers—high school seniors often have begun exploring this area on their own.

With so many prospective students bringing actual technology-based performance skills to the table, the rich diversity of course offerings we already had in place in the music technology area at UCM, my own credentials as a performer on both saxophone and technology-based instruments, and our statewide mission in professional and applied technology, I felt that it would be appropriate for us to create a course of applied study in technology-based instruments. We admitted our first cohort of students in Fall 2014 and to date, our experience has been very positive.

### Music Technology Performance Curriculum

Performance study typically includes private lessons on an instrument or voice as well as participation in ensembles. In creating our new applied area, we set up the following courses, modeled on our existing offerings for traditional instruments:

- Mus 1460 Music Technology Performance I (repeated up to four semesters)
- Mus 3400 New Technologies Ensemble (repeated at will)
- Mus 3460 Music Technology Performance II (repeated up to four semesters)

In the first two years, our music technology performance students take Mus 1460, where they study as a group, rather than in private lessons. I find it important to give the students plenty of exposure to each other's work in process, so that they can see how other students confront challenges similar to their own. The program is just entering its second year, so we have

not offered Mus 3460 yet. As with upper-level applied study on traditional instruments and voice at UCM, students will have to pass a sophomore performance exam before being admitted to Mus 3460, which will be taught as private lessons.

The curriculum is relatively similar to typical curricula for applied instrumental study. Each student is assigned repertoire and there is a performance jury at the end of the semester, assessed by our two music technology professors and two professors from other areas of our department, who have experience with music technology. Repertoire does present some challenges: see the Repertoire section below for more on that.



### New Technologies Ensemble

The laptop orchestra model works very well, and forms one possibility for giving technology-based performers a large ensemble experience. Many laptop orchestras start with the idea that all performers will use laptops and often, that they will all use identical or nearly-identical hardware and software. Additionally, much of the music written for laptop orchestra involves networking the computers and running software to distribute various aspects of the work across the network of performers. Often, the creation of the software itself is a significant part of the ensemble members' participation in the group.

In the UCM New Technologies Ensemble (NTE), we value the laptop orchestra model, but follow a slightly different

organizational philosophy. First, while most of our ensemble members do perform on laptops, openness to a variety of technologies is one of the core principles of the group. Students have performed on hacked GameBoys, turntables, mobile devices, and via live-processed acoustic instruments, in addition to performing on laptop, and often are able to choose their own software. Second, while we do often perform music created entirely via technology, collaboration with acoustic musicians, to form hybrid ensembles, is also one of the core principles of our group. The directors of UCM's Symphonic Wind Ensemble and Symphony Orchestra are interested in performing music involving live electronics, for example, and are able to draw upon NTE personnel to realize those works. Similarly, in the NTE, we are able to draw upon acoustic performers from our other ensembles to realize hybrid works.

The fluid, open nature of the NTE works very well for us: we often perform laptop ensemble works, including networked pieces, but we are also easily able to follow different musical paths, drawing on the pre-existing performance strengths of the ensemble members on their own equipment. Allowing them to use their own equipment and software as they see fit, with occasional guidance from the ensemble director, adds complexity and challenges to programming music for the group, but also offers valuable benefits.

### Repertoire

Repertoire presents significant challenges for both solo and ensemble study, but equally presents refreshing opportunities, especially appealing to composers. The primary challenge is self-evident: the extant repertoire for these instruments is very limited, both for solo study and for the ensemble. In addition to assigning works from that limited

repertoire, I require students to compose music themselves, both because it helps to expand the repertoire, and because composition is part of the core skill set for almost all technology-based performers today. I also believe it is important to find ways for these students to engage with music from a variety of historical periods, so arrangements and transcriptions are a matter of course.

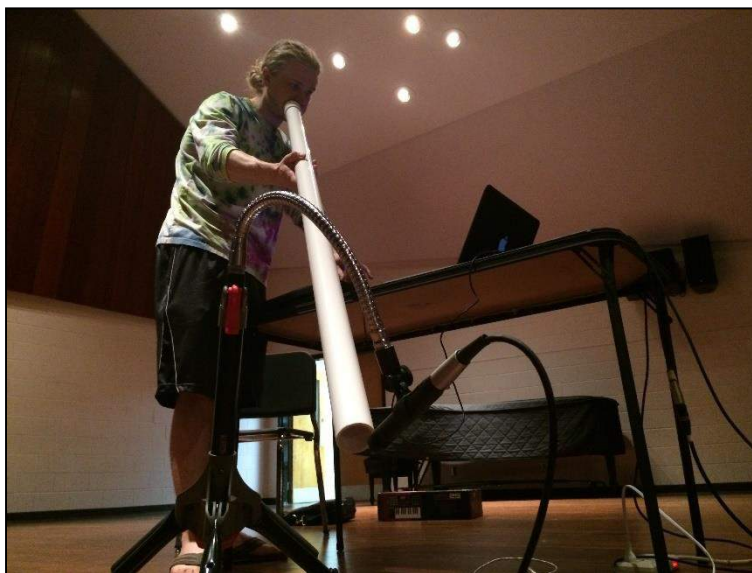
A second challenge arises with regard to repertoire for solo study: the lack of etudes or even appropriate technical exercises designed to develop their skills. I have found no dedicated collections of etudes. Even technical exercises are questionable. All musicians play their scales... but for a performer on laptop, what exactly is the point of that? He or she could easily write a bit of code that could play scales perfectly in any key, quicker than any human could possibly play them.

I have tackled this second challenge by assigning repertoire that requires them to engage with their instruments in various different ways. We work to identify elements that are endemic to technology-based performance and develop exercises for those. Additionally, I work with

students individually to identify specific challenges they face and to design methods to help them overcome those challenges.

Thus, in Spring 2015, each student had four assignments:

1. Compose a new piece for themselves to perform. Completely open with regard to style or genre, the one requirement was that they had to be actively involved in performing the work in some way that made a significant difference in the outcome. Merely pressing the spacebar on their computer's keyboard did not constitute active involvement.



2. Adapt a piece of their choice composed before 1900 to their performance setup. The minimum expectation was to set the work via MIDI, again with some significant involvement from them in live performance. Going beyond the minimum, however, involved somehow reworking the music to take advantage of the possibilities of their instruments—perhaps involving timbral changes, live processing, or other sorts of wizardry.
3. Prepare, score, and perform a diffusion of a given stereo acousmatic work into 8-channel surround. All students were given the same work (Jason Bolte’s excellent piece *Friction*), along with a collection of readings about diffusion and a set of sample scores.
4. Prepare and perform an improvisation with Ben Carey’s *\_derivations* software. This software takes a monophonic input, analyzes it in real-time, and responds to it in an autonomous manner. It also allows the performer to build catalogs of material, over multiple sessions, all of which the computer can use in live performance.

Meanwhile, in the ensemble, I have taken a similar approach, embracing a broad, varied approach to programming. Each semester, we have performed arrangements of old music, including Terry Riley’s *In C*, *Contrapunctus I* from Bach’s *The Art of Fugue*, and King Crimson’s *Discipline*. We have also performed works involving graphic notation, including Casey Farina’s *Force.Line.Border* and Stephanie Neumann’s *Regarding a Maze*. I have split the ensemble into smaller groups of trios and quartets, who were required to collaborate and jointly compose a work for their group to perform. Finally, we have performed group improvisations, generally employing a role-based model for organization.

In Fall 2015, our concert program includes a work for iPhone octet by SCI member Mike McFerron, a graphic notation piece by the fantastic Australian composer Cat Hope, an arrangement of a work by Palestrina, and my own new composition, *Z2Y*, for nine networked laptops, inspired by and troping on the iconic prog-rock track, *YYZ*, by Rush.

## Opportunities for Composers

Clearly, an applied area with such scant repertoire presents wonderful opportunities for composers. In addition to the compositional requirements of the students, we issue a periodic call for works via email and Facebook. Last year, I received almost fifty submissions from across the United States and internationally. We will refresh that call for works this fall, so I hope readers will keep an eye out for it.

We are interested in works for the technology ensemble as well as those appropriate for solo study. We are open to graphic scores or works for indeterminate instrumentation, as well as for works composed directly for technology ensembles. Works involving one or more acoustic performers are also possible, although the common “instrument + electronics” paradigm of a solo performer with computer or fixed accompaniment is not a good fit for this call.

We are also currently working with our director of bands to begin a commissioning project. This follows a successful collaboration in 2013, when our bands commissioned me to compose a work for wind ensemble and live electronics. The commissioning project will go live soon, and will involve works for conducted chamber ensembles (from about 10 players up to full wind ensemble) incorporating live technology as well as acoustic instruments.

## Frequently Asked Questions

*1. Do students have to major in music technology to take lessons in music technology performance?*

As with any other applied field, music technology performance students can pursue any music degree they wish: for example, it would be possible for a student at UCM to complete the B.M. degree in performance, or in jazz/commercial music with music technology as the primary instrument. It would even be possible for a student to pursue the Bachelor of Music Education degree with music technology as the primary applied area, although we would discourage this goal at present. In our view, the world of K-12 education today is so strongly based in traditional instrumentation that a student pursuing this path could be at a significant disadvantage upon graduation. However, five or



ten years from now, it could very well be that the field will have changed, and that technology performers could find a place in our high schools. All that said, to date, all technology-based performance students are pursuing the music technology degree. The New Technologies Ensemble has included students from other majors, including music performance and jazz-commercial music.

*2. What has been the impact on the other applied areas?*

When I mentioned our pursuit of this path to them, some colleagues outside UCM were concerned about the possible impact on our other applied areas. They worried that opening this door would lead to serious attrition in the other studios. It is true that some of the students now pursuing music technology performance switched to that field from other applied studios. However, the impact was relatively insignificant, and the students in question were not especially happy in their original performance areas. They were studying those applied fields because they had to study something in order to pursue the music technology degree, and those were fields in which they could pass the audition.

*3. How did your faculty respond to the idea?*

Again, some colleagues from outside UCM have expressed surprise—if not shock—that the rest of our faculty supported this initiative. There were some questions from our faculty early on, primarily concerned with maintaining standards. None of us wanted to open the door to a flood of students requiring extensive remedial course work, as we would not be able to meet that need. The structure of the curriculum and the rigorous audition requirements answered most of those questions. In the end, the motion to begin offering this applied area received unanimous support from the faculty.

*4. What do you require in the audition?*

All auditions at UCM involve a diagnostic music theory exam. Prospective students in this area must possess the same basic fluency with written music and fundamental structures of music as other prospective music majors. The performance audition is modeled on those in other applied areas, requiring the student to prepare one work of their choice and complete some sight-reading, appropriate to their instrument. If they play an instrument designed to work with melody and

harmony (e.g. a laptop with a keyboard controller), I use a sight-reading excerpt incorporating varied rhythms and melody. For those whose instruments do not readily work with melody and harmony, I use a rhythmic sight-reading excerpt. For someone auditioning on turntables, for example, I ask them to get two sounds of their choice spinning and in sync on their decks, then move the crossfader between those, in time with the music, and in the given rhythm from the sight-reading.

*5. What equipment do you use or recommend?*

As a point of philosophy, I do not mandate any particular pieces of hardware or software for students. As with most other applied study areas, I do expect students to provide their own instruments, which generally include a computer, one or more pieces of software, and often some ancillary hardware, like an audio interface or a MIDI controller of some kind. Our studio has a number of different controllers available for student experimentation as well. When asked, I do recommend Ableton Live as an excellent platform for live performance. While we teach primarily Pro Tools, Logic, and Max in our music technology degree program, the specific feature set of Ableton Live works extremely well for live music performance. The studio where we teach technology performance has a computer, audio interface, mixing console, and 2.1 Genelec speaker system. It also has 8 JBL Eon speakers mounted on stands. We use those for 8-channel work (mimicking the 8.4 Meyer Sound Laboratories system in our recital hall) but also for the technology ensemble, with each ensemble member connecting to an Eon. The Eons have built-in 3-input mixers, so we can accommodate an ensemble of up to 24 performers in this way.

