**FUNDING PROPOSAL FOR ACTIVE ACOUSTICS TECHNOLOGY 6-21-16**

**EXAMPLE DRAFT**

Title: Rehearsing & Performing Music with Active Acoustics Technology for Grade 9-12 Music Curriculum

Music, more than any other subject, is learned by listening. Students need to learn to hear differences in intonation (precise placement of pitch), dynamics (loud to soft), articulation (precise attack and release of notes) and balance (coordinating individual’s sound within the large ensemble). Only learning in an environment with music-specific acoustics enables students – either instrumentalists or vocalists – to fully develop the skill called critical listening. When a rehearsal room doesn’t provide the proper acoustics, it becomes more difficult for students to hear effectively and improve musically. No one would expect a student in literature, history or math class to read from a textbook under only dim lighting!

Tennis players practice on the court; football players head to the field. It’s logical – the best place to practice is where you’ll be playing. For music students, however, there is often a significant difference between the acoustics of their rehearsal space and their performance venue. And unlike tennis courts and football fields, which feature uniform dimensions, performance venues can vary widely in dimensions and construction materials, both of which greatly impact acoustical characteristics.

New active acoustics technology can now bridge these gaps, simulating a wide variety of performance-area acoustics within a single rehearsal space using computerized digital signal processor, microphones and speakers. The system also includes digital record/playback capability, offering immediate feedback/self-critique for groups or individuals.

Goals/Objectives: This technology accelerates learning and deepens skill development, helping students satisfy specific curricular requirements (district, state and national standards, including the 2014 National Music Standards formulated by the National Coalition for CORE ARTS Standards). In the National Standards, for example, the technology positively impacts three artistic processes: Performing, Responding and Creating. Active acoustics technology can benefit learning in these specific ways:

**1. Performing.** *“…Perform expressively, with appropriate interpretation and technical accuracy, and in a manner appropriate to the audience and context.” Essential questions include how performers interpret musical works and improve the quality of their performance.”*

Technology Application: Whether for solo or group performance, students can now realistically prepare to perform in various acoustical environments, including simulating either the venue the composer originally intended for the performance (a Baroque-era recital hall, for example) or the venue where the performance will actually be happening. For music students, a performance is equivalent to the final exam administered in core academic subjects – it represents the culmination of student preparation. Active acoustics technology enables students to perform at their best, whether in the auditorium, gym or football field.

Benefit: Through critical listening, students can learn how their technique needs to adjust to different acoustical environments. For example, when learning intonation (precise placement of pitch) students can better hear and blend their own sound with the ensemble in the reverberant, acoustically enhanced room. When the active acoustics technology is turned off, students can hear their own individual pitch more clearly.

Dynamics is another aspect of musical development enhanced by active acoustics technology. The definition of “loud” or “soft” will vary based on a room’s size and acoustical characteristics; now musicians can effectively learn how much sound they need to produce, experiencing different spaces with just the touch of a button. It may seem counterintuitive, but musicians can actually play more quietly in a resonant space because the acoustics of that space will help carry the sound. In contrast, playing in an acoustically dead space can be an uninspiring experience for students because their sound is stifled.

Active acoustics technology also helps develop the performance skill of taking risk, which is a key element of teaching artistry. With dynamics, for example, student musicians can risk playing louder or risk playing softer and learn what they can and cannot do in different acoustical environments.

For vocalists, the acoustical environment affects their awareness of air flow and creating enough volume to fill the space. For wind instrument players, the active acoustics technology can help members of an ensemble better learn to coordinate their attacks and releases of notes, which are essential aspects of playing as a cohesive group.

Using the digital record/playback capability, a student could prepare for a solo performance by playing while the accompaniment recording is played through the system’s speakers.

**2. Responding.** *“Support interpretations of musical works that reflect creators’/performers’ expressive intent.” Personally evaluate musical works and performances by analysis, interpretation and established criteria.*

Technology Application: Ensemble rehearsals or private sessions can be recorded and downloaded for immediate evaluation, self-critique or future contest submittal.

Benefit: One high school orchestra director using this technology said his students across a wide range of skills experience similar, positive effects. “They’ve been inspired to listen differently and to practice more,” he notes. “Anything that inspires more practice is a good thing.”

And the technology enables different levels of listening. This orchestra director says the first time his students hear themselves they ask, “Are we really that bad?” “Yes you are,” he tells them. “That’s why we’re listening to it.”

Once his students get past the self-conscious aspect, they can start responding in a more technical way: a certain section is out of tune, the playing is not together, one section cannot hear another section, etc. Those are the first performance responses by his students.

The technology also provides his students the opportunity to move to a more artistic level. “Let’s set the question of playing in-tune aside for now,” he’ll say to his players. “We’ve talked about shaping this phrase with dynamics and expression to say something interesting beyond just technically playing the notes…can you hear that? If not, we need to work on that aspect more.”

From the perspective of the National Standards, responding involves emotional and psychological components – an artistic response to music. The record-playback technology helps student musicians respond in an artistic fashion, encouraging them to ask themselves, “Are we telling the story we want to tell? Are we taking the composer’s intent to heart and feeling moved by this recording? If I’m not moved as a musician, how can I expect the audience to be moved?” Those are all challenging questions for developing musicians.

To analyze the overall structure, shape and scope of a musical composition, an ensemble can listen to its own recording rather than a recording by a professional orchestra. It’s a more immersive experience for students, realizing that together they are co-creators of the final piece.

The record-playback capability strengthens the students’ ability to listen intently. The earlier in the rehearsal cycle for a new piece, the more feedback student musicians need. Traditionally that falls to the conductor. But if students can be empowered to take ownership, they will learn more quickly and effectively. Building the habit of listening with intent – technically and artistically – accelerates their learning!

**3. Creating.** *“…create musical work that meets appropriate criteria. Share creative musical work that conveys intent, demonstrates craftsmanship and exhibits originality…Musicians evaluate and refine their work through openness to new ideas…”*

Technology Application: “Creating” is the work of individual practice and group rehearsal. Students will learn how to rehearse more intelligently, adjusting their playing to suit different acoustical environments, while receiving immediate feedback from digital record/playback technology. Students creating a brand-new musical work can take that work with them, to evaluate and refine later. There is also an inspirational benefit; the active acoustics technology raises the students’ interest level and engagement with the creative process.

Benefit: One high school band director using this technology daily cited comparison listening as its strongest tool for students to understand differences in sound, balance, starts/stops to notes and tonal matching. This director begins rehearsing with the acoustical system off, then adds acoustical enhancements to subsequent recordings so students can compare; finally they compare with the initial, system-off environment.

Implementation: Technicians from the Wenger Corporation will install the necessary speakers, wiring and digital signal processors in the music rehearsal room. Operation of the active acoustics system (including selection of one of nine acoustical environments and digital record/playback) will be provided by a free-standing control panel that can be placed near the director. Technicians will also measure the acoustical characteristics of a specific performance venue selected by the band director (usually the school’s auditorium or typical performance venue). This performance venue will be replicated with a custom acoustical setting.

Evaluation: Solo and ensemble performance at regional and state contests will be one objective standard by which student achievement can be evaluated. During the school year, the record/playback feature will enable easier, faster assessments of both solo, sectional and ensemble work.

Budget: Specific budget will be determined after rehearsal room has been evaluated, but the estimated cost is between XXXXX and XXXXX.