

A Newsletter from **Stewart Acoustical Consultants**  
and **F.C.Schafer CONSULTING, L.L.C.**

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*Making our World Sound Better Since 1979*

## Happy Holidays – Merry Christmas - Happy New Year



From all of us, a Merry Christmas and Happy New Year! We look forward to working with you in the new year.

**Joe Bridger named to Board of NCAC** - Joe Bridger has been chosen by the Board of the National Council of Acoustical Consultants to serve on the Board as a representative of elected Individual Members of NCAC. NCAC is an association of Firms, but a designated principal of each firm is recognized as an individual member to represent the firm. Other principals and employees meeting the qualifications required of principals may be elected as Individual Members. Joe has been an Individual Member of NCAC since 2005. The NCAC board has one position specifically for an Individual

Member representative. Joe will serve the remainder of a 2010-2012 term and be up for election to a full term in the spring.

### Durham and Cary AMTRAK Train Stations get acoustic upfit –

The Durham train station (through our collaboration with AVCON, Inc.) had acoustical treatment included in its design to ensure a clear announcement system for passengers. One of the treatments was cleverly hidden on what appears to be large photos of historical trains, but in reality are acoustical wall panels with photos digitally printed onto them – one picture from the News and Observer can be found [here](#). This was a historic retrofit, so it was not possible to cover up the wood roof, but the treatment was carefully hidden in the surrounding walls. Historic preservation was not an issue for the Cary station lobby but the space was very tall. As a result acoustics was a concern. The desire was to place an interesting architectural element into the space and still get the desired degree of sound absorption to make speech clear for passengers and keep the lobby tranquil. This was achieved with a special acoustical sculpture created by Matt McConnell of McConnell Studios using Decoustics baffles. It is quite a spectacular result. (Photo at right courtesy McConnell Studios.)



### SAC, Fred Schafer, and MMGAC expand partnership – offering Audio/Video Design assistance to India Market

– We have been working with Mathew George and his firm for many years. He is a former employee whom went back to India and established his own firm. We've had a great collaborative partnership between the two firms. There is a significant need for quality control of audio/video systems in India. We are excited about the opportunity to help MMGAC's clients get quality audio/video systems. Groundwork has been laid for two major projects already. This further expands our global reach.

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Fred Schafer – updates from **F.C.Schafer** CONSULTING, L.L.C.

**Classroom Acoustics & Sound Systems** - A recent article sparked some discussion amongst those of us that deal with classroom acoustics and sound systems. The article stated, incorrectly, that ANSI S12.60 supported or encouraged the use of classroom sound systems. The use of sound systems in the classroom has been supported by some researchers who cite their study results which indicate improved student test scores for those students where a sound system was in use and in the advertising by the manufacturers of that equipment.

ANSI S12.60 provides design goals and limits for noise and reverberation in the classroom. It also provides formulas and methods to achieve those goals. Within the ANSI 12.60-2010 standard it states that "Classroom audio distribution systems, if installed, shall not be used as a substitute for achieving the acoustical design requirements of this standard". The standard goes on to define the frequency response and reference for measurement of coverage for these systems.

While addressing the ability to use a classroom sound system, ANSI S12.60 does not address the additional ADA requirement (Confirmed by ADA/DOJ) that whenever a sound reinforcement system is in use in a public access facility, like a classroom, a hearing assistance system must also be operational for the hearing impaired. Based on recent cost quotes the cost of a basic hearing assistance system is between \$800.00 and \$1,000.00 plus installation. This could result in an initial budget increase of 50% to 100% per classroom sound system. The cost of operation and maintenance over the potential life of these systems is not even considered in this cost.

**Educational Facility Theater – Control Room Access** - Recently, we provided review of a high school auditorium/theater for a client. In our review we made note that the control room, located on the second floor level behind the audience, did not have handicapped access. Our client politely informed us that ADA-2010 for "Employee Work Areas" did not require handicapped access citing that, "The 2010 ADA appears to have changed the language cited below to drop specific reference to control rooms and projection booths. In addition, it has added an exception in paragraph 203.9 that excluded employee work areas under 300 sf and elevated over 7" above the finish floor line from being on an accessible route." Sure enough, they were right. However, (there's always a however) to review our understanding of the need for handicapped access to this area we checked with ADA/DOJ and were informed that if an auditorium/theater facility control room area will be operated by students or used for educational/instructional purposes then access to the area falls under the same requirements as a classroom per Title-II accessibility. Therefore, to avoid the requirement of handicapped accessibility to equipment located in an auditorium/theater control room, the equipment must be accessed and operated only by an "employee", not a student. In the past, an alternate control location at a handicapped accessible area within the audience was considered acceptable. A ruling by the DOJ disallowed this option a number of years ago. While we are not, by any means, experts or arbiters of ADA and accessibility requirements, and should not be depended on as such, we do encounter these requirements in our work and endeavor to make you our clients aware of potential issues.

**Current Projects - New Science Building for Johnson C. Smith University** - We are just beginning work with Gantt Huberman Architects in Charlotte, NC on this facility that will include a large lecture hall and multiple distance learning capable classrooms in addition to a welcoming atrium space and other educational areas. **Bethel FWB in Kinston, NC** – We are pleased to provide acoustical and sound system testing as part of a plan to improve the overall sound in the worship space and choir. **St. Thomas Aquinas Catholic Church, Charlotte, NC** – We were pleased to provide a study of the sanctuary acoustics with recommendations for acoustical remediation and enhancement of speech intelligibility and musical quality. Additionally, we provided a study, recommendations as well as system "equalization" for the existing sound system. This work is part of an overall plan by the church to improve and enhance the worship experience for their parish congregation. **K. R. Williams Auditorium – Winston Salem State University, Winston-Salem, NC** - Work has just been completed by Barbizon, Charlotte for the replacement and upgrade of the stage rigging system for the theater. The new rigging replaced the traditional counterweight system used to support the lighting battens with motorized battens. The original counterweight rigging was completely replaced using the new Thern "Box" arbor system and non-compression line locks. As part of this upgrade, the index rail lighting, which was omitted from the original installation, was installed.

**Local Noise Ordinances in North Carolina** - In our last issue we promised a discussion of local noise ordinances in North Carolina. We have compiled a list of localities with quantitative ordinances applicable to either sound in general or amplified sound. Ordinances limited to other specific sources were not included. The list is posted [here on our website](#). The list includes the key factors of each ordinance. Separately, we have posted a [document that discusses these ordinances](#). Every ordinance found has some kind of flaw or problem. Some of these are very serious, such as requiring measurements using instruments that have not been made in the last 50 years. The 11 most common problems found in these ordinances are as follows:

1. Use of old pre-1962 octave bands
2. Failure to indicate fast or slow time weighting
3. Limit not clear when the "use" of the source and receiver property differ
4. Limits appropriate for a receiving land use applied based solely on the source land use
5. Same limit for all property uses, too high for residences or too low for other uses
6. Same limits day and night
7. Limits appropriate for continuous sounds applied to brief events
8. Limits appropriate for brief events without any limit on duration
9. Limits so low that everyone's air-conditioning condenser is in violation
10. High limits for every Friday and Saturday evening without any permits required
11. No appropriate lower limits for sounds that contain information content and are designed to get attention (music, speech, siren-like sounds from some mechanical equipment, impulsive sounds like gunshots, dog barks)"

**Fitness Gyms in Multi-tenant Buildings** - We have faced several problems where fitness gyms with weightlifting or aerobics are in buildings with other tenants, sometimes even on upper floors. Aerobics studios tend to have very loud music and issues related to jumping and even dropping things on the floor. Normal buildings are not designed and built to handle such though these problems are often solvable with some significant effort. The really difficult and sometimes impossible problem is the dropping of heavy weights of a few hundred pounds on floors. Such heavy dropped weights can create problems from structureborne sound even to adjacent spaces on grade. It can be essentially impossible to isolate such weight drops on upper floors unless possibly the floor structure is very heavy thick concrete that can support a floated slab. Recently, Norm Dotti a consultant in New Jersey reported in a letter to Physics Today an experience with an aerobics class on the top floor of a 40 story building. The rhythmic motions were exciting the building to vibrate so strongly that elevators were binding and people in offices were becoming nauseous. Any attempt to put such high energy uses in a normal building with other people needs very careful attention.

**Acoustics in Single Family Homes** - We are seeing a new market in the acoustics of high-end custom single-family homes. We are finding that the owners of such homes are now often looking for the higher degrees of privacy within the home approaching that usually found only between residences in multi-family structures. Other concerns are mechanical noise issues, isolation from outdoor noise, and room acoustics of large volume rooms.

**Household Appliance Noise** - People are often interested in quiet appliances for homes. Sound levels and sound quality of appliances do vary significantly. Here are a few guidelines to help. For garbage disposers, look for an "induction" motor. For dishwashers, select models that have dual pumps, that is separate pumps to supply and discharge water. New refrigerators are often noisier than older models due to energy efficiency requirements. Models with bottom freezers are usually quieter than side by side or top freezer models. The new front load washing machines spin at high speed and can induce strong vibration into wood-frame floors. Especially when not installed on grade or on a heavy concrete floor, look for models with extra attention to automatic balancing of loads.



**National Council of Acoustical Consultants, 50 Years** - The National Council of Acoustical Consultants will celebrate its 50th anniversary with a meeting in Dallas April 13-15. NCAC is an international trade association of approximately 135 acoustical consulting firms primarily in the US. Since 1962, NCAC member firms have lead their profession in technical expertise, research, innovation, and development of real-world applications in all types of environments. NCAC accepts professional firms that specialize in acoustical consulting based upon education, references, and most importantly – the proven experience of the principals of the firm. To qualify to be an NCAC member, the firm

principals that practice acoustical consulting must be full members of either Acoustical Society of America (ASA) or Institute of Noise Control Engineering (INCE). NCAC requires its members to adhere to a strong Canon of Ethics supporting the highest standards of business practice, technical consulting and client service. Noral Stewart is a past president of NCAC.

**International Green Construction Code Update** - Noral Stewart represented five organizations in acoustics at the final hearings on the International Green Construction Code in Phoenix in November. At issue were some proposals accepted at the spring hearings in Dallas and some subsequent public comments that would have modified the acoustics section of the code accepted in Dallas, delete it, or make it a local option. One of the other proposals accepted in Dallas added IIC requirements for residences similar to those in the regular code, but required them even for floor-ceilings within a particular residence and referenced only the laboratory test standard even for field tests. Despite the endorsement of the original author of that proposal, our public comment to delete the requirement within an individual residence and reference the proper test standard was voted down by the few building officials present for the votes taken late Saturday night and early Sunday morning. In the last vote related to the Acoustics section, the body accepted a motion to make it a local option, meaning it will not be in the IGCC unless a particular local government specifically adds it.

**Classroom Acoustics Rules Go To Congress/ADA proposed rule coming soon** – As reported in an [ASHA newsletter](#), school modernization legislation was introduced in the Senate that would call for all schools using the appropriated funds to meet the classroom acoustics standard ANSI S12.60 and that funds can be used to reduce “noise pollution.” While the bill is not expected to be approved, it is a sign of growing interest in federal legislation for modernizing schools and including classroom acoustics. According to the Access Board website [here](#), in November 2010, because of the rejection of classroom acoustics into the current International Building Code by the International Codes Council, the Access Board’s “*ad hoc* committee reviewed draft text for a Notice of Proposed Rulemaking on classroom acoustics. The next step is to develop a regulatory assessment and preamble to accompany the NPRM....At the end of FY 2011, we contracted with the National Institute for Building Sciences to complete the regulatory assessment. A proposed rule is planned for FY 2012” which is from October 2011 to September 2012.

**ASTM Committee 33 Standards** - Earlier this year a major revision of E1007, the standard for field measurement of impact sound transmission was approved. Recently what is hoped to be the last (for a while) in a series of revisions to the E336 standard for field measurement of airborne isolation was approved. Dr. Stewart led that effort and is also leading the revision of E1557 regarding operable partitions presently in progress. The revision of E1557 will make it clear that the standard is a guide for the use of the architect in the design of buildings with operable partitions, and not a document to be imposed on the supplier of the partition. Dr. Stewart has been appointed chair of ASTM subcommittee 33.05 on Research, and has been elected to a two-year term as vice-chair of committee 33 on Building and Environmental Acoustics.

**Edison Electric Institute Fall Health and Safety Conference** - The Edison Electric Institute held its fall national health and safety conference in Charlotte. Noral Stewart made a presentation and led a discussion on noise control in the power industry.

**ASHRAE TC 2.6 and Standard 189.1** - Joe Bridger has joined ASHRAE and has been accepted as a member of TC 2.6, the committee on noise and vibration control that prepares the sections of the ASHRAE guides on noise and vibration. This committee is also involved in a revision of the acoustics portion of ASHRAE standard 189.1.



**NC Chapter Acoustical Society of America - Barnobi is Chair** - Chris Barnobi (left) of our firm is serving as the 2011-12 chair of the North Carolina Chapter of the Acoustical Society of America. NC ASA has held two meetings a year for over 45 years.

**Harne awarded Royster Prize** - Ryan Harne (right) a doctoral candidate at Virginia Tech was awarded the Royster prize for graduate studies at the fall meeting of NC ASA held in Chapel Hill. Harne's research involves the harvesting of energy from vibrating structures in the process of reducing the vibration and noise radiated. The Royster prize was established

by Larry and Julie Royster of Raleigh and is awarded each year by a regional chapter of ASA. The NC Chapter has awarded more of these prizes than any other chapter.



**Technicon Acoustics Acquires Laboratory** - Technicon Acoustics of Concord, NC, a manufacturer of noise control materials for the heavy machinery, industrial, medical, transportation and marine markets, has announced the acquisition of an expanded laboratory facility in Charlotte that includes a hemi-anechoic chamber and reverberation chambers. The new acoustics lab will allow Technicon to offer expanded services for customers including product development and testing, product qualification, and material performance comparison. Dr. John Gagliardi who has been a part-time member of our staff is the Technical

Director for Technicon Acoustics.



## Acoustical Product News

**RPG Inc. adds Modex Edge** –RPG announces the [Modex Edge](#), a low frequency absorber. The Modex Edge is a stackable modular element, available in a wide range of colored textiles and wood face frame veneers, intended for use in corners and mid-wall placement. It is designed to reduce modal resonances in small rooms.

**RPG Inc. adds graphics to cloth-covered and translucent absorbers** - [Deamp microslit transparent and translucent absorbers](#) is the most thrilling concept as the absorber turns into a form of visual backlit/naturally lit imagery. The placing of digitized artwork on fabric wrapped panels has been done by several manufacturers in recent years including Durham Train Station.

**Wenger Acquires J. R. Clancy Company** - The Wenger Corporation, the major supplier of equipment for school music programs, has acquired the J. R. Clancy Company, the leading supplier of stage rigging systems. The only overlap between the two companies is in the area of orchestra and choral stage shells where they are two of the major suppliers. J. R. Clancy will continue to operate under its own name.

**The “Regupol” Confusion** - Over the past several years a recycled rubber product that has become widely known as “Regupol” has been used successfully for the isolation of footsteps on floors in multifamily buildings. The “Regupol” name originated with products made in Germany, but when the Dodge Cork Company developed similar products they entered into an agreement with the German company to use the name “Dodge Regupol.” As we reported in 2008, that agreement has ended and the US company is now known as Ecore International and the products many have known as “Regupol” are now branded as Ecore QTscu and QTrbm. Further, very similar products can be purchased through another company Pliteq as GenieMat RST and GenieMat FF. However, the real confusion is that the German company has now made an agreement with another supplier of floor isolation materials to use the “Regupol” name for products made in the US. Thus some similar but not exactly the same products are now available with the “Regupol” name. If you are not careful in what you specify, you may not get what you really intended.