

A Newsletter from *Stewart Acoustical Consultants*

7330 Chapel Hill Road, Suite 101 Raleigh, NC 27607

Ph. 919-858-0899 sac@sacnc.com *Making our World Sound Better Since 1979*

**First LEED Gold K12 School in South Carolina** – Stewart Acoustical Consultants was pleased to work with Moseley Architects on the Jackson School in Kershaw County, SC which has become the first K12 school in South Carolina to achieve the LEED Gold status.

**Increased Work Nationally and Recovering Economy** – Our firm has traditionally concentrated on serving the needs of our local region in North and South Carolina and southern Virginia. However, with the economy slowing down over the last two years we began aggressively seek work nationally. As a result, in 2010 approximately a third of our billings were related to work on projects located outside our traditional service area, in DC, New York, New Jersey, and even California and Hawaii. We hope to be able to maintain this national presence and continue to serve our local clientele as the economy recovers. We have seen a dramatic increase in demand for services, and we believe this indicates that positive economic recovery is occurring. Chris Barnobi is now very busy and we are expanding our capability through the use of part-time employee John Gagliardi, and contractors Mathew George and Richard Honeycutt. We are now also registered with the Federal procurement system to more easily contract for federal projects.

**International Green Construction Code** – On January 3, Noral Stewart submitted comments to the International Codes Council on behalf of the Acoustical Society of America, the National Council of Acoustical Consultants, the ASTM task group on building codes, and the co-chairs of the Building Acoustics council of the Institute of Noise Control Engineering. This unprecedented show of unanimity in the acoustics world was essential to prevent the adoption of code requirements that were technically unfounded and would have resulted in problems in buildings. We can now report that both the full board of the Institute of Noise Control Engineering and the governing board of ASHRAE TC 2.6 on Noise and Vibration have voted to endorse the comments. These comments were developed as a consensus position and organizational approval was obtained over an extremely short period in November and December as required by the ICC. Hearings will be held in Dallas in May.



**LEED for Healthcare Passes Ballot** – LEED for Healthcare has passed ballot in November and will be available for registration of projects and will be available for registration of projects in the spring of 2011. The LEED rating system offers one point for meeting the FGI privacy and background noise requirements, and a second point for meeting the room acoustics and outdoor sound isolation requirements.

**Online Guidance on Acoustics for Healthcare** – The documents with details of what can and must be done for healthcare acoustics where the FGI requirements apply can now be found online in free Read-Only versions. The FGI document [Guidelines for Design and Construction of Health Care Facilities](#) prescribes requirements. The acoustics material is on pages 24-27 with tables on pages 35-37. [Sound & Vibration Design Guidelines for Health Care Facilities](#) is referenced in the FGI document and provides much more detail on good acoustical design. [Acoustics in Healthcare Environments](#) is another very good document prepared under the sponsorship of the Ceiling and Interior Systems Contractors Association.

**Breakthrough in Loudspeaker Design** – Martin Audio has announced development of a “[multicellular loudspeaker array](#)” system that allows strong control of the sound radiation pattern. You may be familiar with line-array systems that can control sound in a horizontal pattern. The new system takes that a step further with ability to distribute sound over a large outdoor audience area with almost equal levels from front to back - giving the audience a much better experience, and also to control and limit the spread of sound outside the audience area - reducing impact on surrounding communities. The system also can be used indoors to limit sound reflecting from walls and give the audience a clearer and more consistent experience throughout the room. It is expected that other manufacturers will come out with similar systems. This new technology is not yet widely used but offers much promise for the future.

**Federal OSHA Backs Off** – The US Occupational Safety and Health Administration has withdrawn its proposed change in the interpretation of “feasible” noise controls, reporting that it required more outreach and resources than initially anticipated. "Hearing loss caused by excessive noise levels remains a serious occupational health problem in this country," said David Michaels, assistant secretary of labor for occupational safety and health, in a press statement. "We are sensitive to the possible costs associated with improving worker protection and have decided to suspend work on this proposed modification while we study other approaches to abating workplace noise hazards."

**Aircraft Flight Route Changes** – The FAA is implementing changes in aircraft flight tracks that could change the locations of noise from aircraft up to 20 or 30 miles from airports. There are two aspects to the changes which are part of a program which was initially called RNAV, but which is being renamed with a further change discussed below. One part is that once the aircraft get 20 to 30 miles from the airport they will be given more flexibility to set their own flight paths. That could disperse noise over wider areas perhaps resulting in some areas getting some increased noise and some a little less. However, the bigger changes will be in the areas closer to the airport. In the past, aircraft started dispersing along many different paths shortly after takeoff, and converged on their final approach closer to the airport. With the new system all aircraft on a particular runway for approach or takeoff followed the same path for much longer distances from the airport. They also will be kept to lower altitudes on takeoff. This means areas under these paths will get a concentration of noise while other areas to the sides that previously had some of the dispersed aircraft will have less noise. Some areas several miles from an airport that previously had some high flying aircraft could find themselves under a steady stream of aircraft at lower altitude. This could have implications for the suitability of certain locations for development.

**N C DOT Participates in Tire-Pavement Noise Research Consortium** – Speaking of tire noise, the NC DOT is one of 9 state agencies participating with the Federal Highway Administration in sponsoring the Tire Pavement Noise Research Consortium. At highway speeds the interaction of tires with the road becomes the dominant source of road noise. Tire companies have learned methods to reduce the noise through tire design. Pavement design also influences the noise. For instance pavements with recesses in a primarily flat surface are quieter than pavements with protrusions extending up from the primarily flat surface. Many factors influence the choice of pavement including local environmental conditions and materials availability, and pavement related noise can vary over the life of the pavement. Federal rules currently do not allow quieter pavement as an alternative to barriers, but an advantage is that it reduces noise everywhere and not just where there are barriers.

## **The Passing of Three Major Leaders in Acoustics and Audio**

**Cyril M. Harris** - Cyril Harris grew up across from the movie lots in Hollywood in the 1920's which led to roles in a few of the Our Gang comedies and an interest in sound with the major efforts of the time to add sound to the movies. As a math student at UCLA he encountered physics professor Vern Knudsen which solidified his future in acoustics. After his MS in physics at UCLA, he joined the wartime effort in acoustics at MIT where he earned his PhD. After a period at Bell Telephone Labs, he joined Columbia University. His first major book with Vern Knudsen was *Acoustical Designing in Architecture* in 1950, the first comprehensive book on architectural acoustics. He then published three major handbooks in acoustics and noise control in 1957, 1979, and 1993, a multi-volume shock and vibration handbook, a book on noise control in buildings, and even a book on plumbing. His major consulting contributions were his work on many concert halls that he continued into his 90's. He handpicked many of his projects he worked on during the last two decades. When once asked how he handled the acoustics of multi-purpose spaces, his response was "I don't."

**Howard Kingsbury** Howard Kingsbury, professor emeritus of architectural engineering at Penn State, died on Jan. 25. He was 88. He received his bachelor of science degree in glass technology from the State University of New York in 1943 and his master of science in ceramic technology from Penn State in 1947. Kingsbury worked for Owens-Illinois Glass Company, the Pittsburgh-Corning Corporation and Sylvania Electric Products between 1947 and 1964. His interest in acoustics germinated at Pittsburgh-Corning where he developed a ceramic based acoustical absorbing material. Kingsbury joined the Penn State architectural engineering faculty in 1964 and served as interim head of architectural engineering from 1983 to 1985 before retiring in 1991. He continued to remain active with the department, assisting in acoustics courses and serving as a juror for architectural engineering senior theses. He was a founding member and former director of the Institute of Noise Control Engineering and served as a national accreditor for acoustical laboratories for the NIST National Voluntary Laboratory Accreditation Program. Howard was active in ASTM and ASHRAE, becoming a Fellow of each organization, one of only 9 acousticians named a Fellow of ASTM for his leadership on Committee E33.

**Randy Vaughan** - Randy Vaughan founded Ambassador Enterprises (now AE Systems) as a part time effort in his native Portsmouth, Virginia in 1969 immediately after graduating with an industrial engineering degree from Miami University where he had been a band drum major and cheerleader. Despite that engineering degree, he was dedicated to music and took a job teaching high school physics so he could pursue his passion. Ambassador Enterprises first offered services in many ways related to music and entertainment as Randy regularly play saxophone with the band the "The Stingrays." He found his forte in the development of sound systems for venues. He was a founding member of the National Systems Contractors Association and served many positions for NSCA from board member to president. Randy helped establish its Education Committee and was chosen Educator of the Year in 2007. He was recently serving as chairman of the Board of the Custom Electronics Design and Installation Association. He was an avid boater and past commodore of the Hampton Roads Yacht Club. Randy died peacefully in his sleep on Dec. 23, 2010 at age 63.

**45 Years of Acoustics in North Carolina – April 1, Concord** - The North Carolina Chapter of the Acoustical Society of America is planning its 45<sup>th</sup> anniversary meeting in Concord April 1. The [Program and Registration](#) information are available online.

**HUD Offers New Calculating Tool, but Beware** — HUD in an effort to make it easier to evaluate the ability of a building to block sound from a highway, airport, or railroad, has put a tool on its website that allows users to compute the composite STC of an exterior wall with windows and doors. Unfortunately this tool then goes further to indicate that the outdoor to indoor sound reduction is simply equal to this composite STC. There are several problems with this and anyone using this simplified approach could find themselves with homes that are a lot louder inside than expected. The first problem is that anytime you are calculating an outdoor to indoor effect you have to subtract 6 from the indicator of the transmission loss of the wall, whatever that indicator. Suppose you have two rooms with walls that have the same laboratory performance, both exposed to sounds that are identical in spectrum and level, but one sound is outdoors and the other is in an adjacent room. The room exposed to sound from outdoors will be 6 dB louder than the one exposed to sound from an adjacent room. Next consider two identical rooms exposed to the same sound outside with walls of identical construction, but the exterior wall of one room is twice the size of that for the other room. The room with the greater exposure will be 3 dB louder. Finally, STC can be grossly misleading as an indicator of sound blockage for many walls exposed to sounds with strong low frequency content such as aircraft, locomotives, and slow moving trucks. It is for that reason the OITC was created 20 years ago as a better indicator for exterior walls, doors, and windows. The STC for many structures is much greater than the blockage of sound from these low-frequency sources. The one place where STC is better than OITC is for high-speed freeway sound with strong high-frequency tire noise.

## New Acoustical Products

**Quiet Chillers** – One of the major problems we encounter is chillers in locations where they stand out as strong noise sources. The worst problems are the screw chillers with strong tones. We have become aware of two chillers which claim to be far quieter than typical chillers. First the [Smardt](#) chiller from Canada is not a screw. It uses centrifugal compressors with magnetic bearings rather than oil lubrication to reduce compressor noise. This is combined with high-efficiency low-noise fans. The [Petra](#) chiller from Jordan is a screw chiller but the compressors are fully enclosed and the system strongly engineered to reduce noise.

**Acoustex-Plank** – Until a few years ago we had available to us an alternative product to Tectum that was very similar but made with Portland cement. This provided a disadvantage that the product was heavier, but a major advantage for outdoor applications. The product was discontinued by the US based supplier, but now we have learned that it is available again through a Canadian supplier. [Acoustex-Plank](#) is a wood fiber material bound with Portland cement, available in a variety of panel sizes and thicknesses.

**Tabbed or Flap Grommet Baffles** – We are pleased to note that more suppliers are now offering less expensive pvc or nylon sailcloth covered baffles with grommets on tabs or flaps to provide better appearance. The traditional baffle of this style would have grommets punched through the baffle which gave a poor appearance quality. [CMA](#) started offering the tabbed option several years ago, and now we note that [MBI Products](#) is also offering the grommet on a flap. The tabbed grommet costs a little more, but in cases where appearance is a concern it is usually considered worth the extra cost.