

# NOISE/NEWS

## INTERNATIONAL

Volume 30, Number 3  
2022 September

*A quarterly news magazine  
and online digital blog published  
by I-INCE and INCE-USA*

■ A Tribute to George Maling

■ Why Would Anyone Want to Be  
a Noise Control Engineer?

■ The Value of Subjective Testing



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# NOISE/NEWS

# INTERNATIONAL

This PDF version of Noise/News International and its blog are published jointly by the International Institute of Noise Control Engineering (I-INCE) and the Institute of Noise Control Engineering of the USA (INCE-USA). The PDF and blog formats mean that issues can be made freely available to our readers. These digital formats reduce publication time, save printing costs, and allow links to be included for direct access to references and other material.

## I-INCE

The International Institute of Noise Control Engineering (I-INCE) is a worldwide consortium of societies concerned with noise control and acoustics. I-INCE, chartered in Zürich, Switzerland, is the sponsor of the INTER-NOISE Series of International Congresses on Noise Control Engineering, and, with the Institute of Noise Control Engineering of the USA, publishes this quarterly magazine and its blog. I-INCE has an active program of technical initiatives. It currently has fifty-one member societies in forty-six countries.

## INCE-USA

The Institute of Noise Control Engineering of the USA (INCE-USA) is a nonprofit professional organization incorporated in Washington, DC, USA. The primary purpose of the Institute is to promote engineering solutions to environmental noise problems. INCE-USA publishes the technical journal *Noise Control Engineering Journal* and with I-INCE publishes this quarterly magazine and its blog. INCE-USA sponsors the NOISE-CON series of national conferences on noise control engineering and the INTER-NOISE Congress when it is held in North America. INCE-USA members are professionals in the field of noise control engineering, and many offer consulting services in noise control. Any persons interested in noise control may become an associate of INCE-USA and receive both this magazine and *Noise Control Engineering Journal*.

## NNI and Its Online Supplement

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The PDF and blog versions of NNI allow for links to references, articles, abstracts, advertisers, and other sources of additional information. In some cases, the full URL will be given in the text. In other cases, blue text will indicate the presence of a link. The NNI blog contains additional information that will be of interest to readers, such as the following:

- The current PDF issue of NNI available for free download
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## Welcome to the September 2022 issue of Noise/News International.

What a blast INTER-NOISE 2022 was. It's hard to pick what the highlight was; hundreds of noise control professionals dancing together in a Céilí, one of the many fantastic plenary talks, or simply catching up in-person with some old friends after too many (albeit enjoyable) virtual conferences! I'll have my full conference report ready for the December issue, but after the success of Glasgow in 2022, I'll be booking my flights to INTER-NOISE 2023 in Chiba (Greater Tokyo) as soon as I can.

For this issue we pay tribute to one of the founders of this very magazine, George Maling, who passed away earlier this year. He's been described as the glue that held INCE-USA together over many years, and his contributions to the noise-control profession are internationally recognized. We present just a short summary of the many many contributions George has made to our community.

Elsewhere in this issue NCEJ Editor, Dr. Jim Thompson, returns with his regular "What is all the noise about?" feature and asks why anyone would want to be a noise control engineer. We also have a NOISE/NOTES round up of some of the stories hitting the news around the world, some product news, and much more.

I hope you enjoy this issue of NNI! 🎧



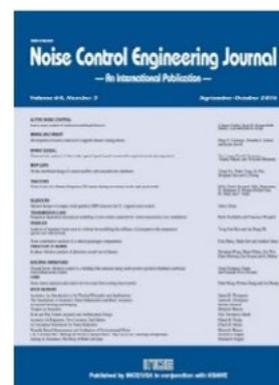
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# A Tribute to George Maling

*The passing of George Maling has been cause for reflection and examination of George's many contributions to INCE-USA, I-INCE and the field of noise control. His contributions are particularly important for readers of this magazine, as it would probably not exist without him! He was a founding member of the INCE-USA in 1971, I-INCE in 1974, and eventually the NNI magazine.*

*At Noise-Con 2014, INCE-USA held a special session to honor the many contributions George made to the noise control engineering profession. What follows are some excerpts of what was presented at that session.*

## About George Maling

*Excerpt from opening remarks by Bill Lang.*

George entered the field in 1954 as a graduate student; and in 1963, when he completed his PhD under Uno Ingard, he had five academic degrees—four from MIT and his Bachelor's degree from Bowdoin College. After consulting for IBM for several years, he became a full timer in 1965 and was the specialist for the corporation available to consult on problems related to product noise control on all four continents. But his duties were principally directed at the design and product development of low-noise business machines for the Poughkeepsie acoustics laboratory.

My first example of his corporate responsibilities were when he was called to an IBM plant in New Jersey manufacturing punch cards for the IT industry. OSHA inspectors found the twenty card manufacturing presses to be over the OSHA noise limit for operator exposure and threatened to close down the plant until a plan was in place for reducing the operator exposure. The local management told George that two years previous they were working on this problem, had a noise enclosure for each press designed, but the operators had them removed as they were interfering with card production. The covers were scrapped. George told management to find one. After a mad scramble, a scrap cover was located on a farmer's field in Indiana; and IBM had it shipped back to New Jersey. The problem with reinstalling the cover was that the farmer had used it as a chicken coop, and it was full of chicken poop. But the plant was rescued from closing when George had the chicken poop removed, the cover re-installed on one press, and the OSHA inspector approved his plan to lower the noise levels of all the presses in the New Jersey card plant. The day was saved with the best analog equipment available in 1967.

There was not much signal processing in this field trip, but George's interest in signal processing was developing, but it was in its infancy. How primitive it was is illustrated by a request by the IBM Executive Vice President for Innovation to demonstrate to the IBM Board of Directors how the field was

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*Slide presented by Eric Wood at 2014 Session honoring George Maling. Here Eric outlines the many contributions George made to INCE-USA*

developing. George, with two engineers and a station wagon full of the best analog equipment then available in 1967, was told he could set up the demonstration in the Board room starting at 5 p.m. for the next day's Board meeting. He worked all night to set up the demonstration with local difficulties; there was not even a 110-volt AC outlet in the room. The demo consisted of an IBM type-bar typewriter at one end of the room and a large meter at the other end of the room with three areas marked. The left sector was marked with a capital I, the middle sector with a capital B, and the right sector with a capital M. With the best analog equipment and microphone in front of the meter, the operator would type an I; and the needle on the meter would swing up to the I sector; with B it would swing up to B; and with M it would swing up to M—all without wires and the rudiments of signal processing. After working all night and getting the demonstration to work flawlessly by 7 a.m., George was confronted at 8 a.m. by the IBM Vice President in charge of arranging the Board meeting for the IBM directors that would convene at 9 a.m. "What's all this stuff?" he asked George. "It's a demo for the Board requested to be set up by the Executive Vice President for Innovation." Without even bothering to look at the demonstration, the IBM VP coordinating the meeting told George that the Board members would be unable

to understand the demonstration and told him to get it out of there. By 9 a.m. the room was clean, and George and his helpers had all the equipment back in the station wagon headed back to Poughkeepsie.

But George's interest in signal processing and the impending evolution of digital signal processing was undismayed. He struck up a friendship with Jim Cooley, an IBM researcher who had developed an algorithm for digital signal processing with John Tukey of Bell Telephone Laboratories. George immediately grasped that this algorithm might be what was needed to move the world from analog signal processing to digital signal processing. Working with Jim and other collaborators from BTL and MIT, he organized two symposia on the algorithm—one held in New York by the IEEE and the second in Boston by the ASA. By the end of 1967 the algorithm had caught fire, not only for the processing of noise signals but for all electronic signals transmitted through the air or on wires. IEEE top management was astounded at this development and requested that George and his collaborators immediately prepare a paper for the proceedings of the IEEE entitled "What is the Fast Fourier Transform?" Every electronic device on your desk or in your pocket today incorporates the FFT or its modern equivalent. What started out as a new technique for processing the noises audible to the ear in digital format was responsible for the explosion of interest in the FFT which has had inestimable benefit to the world.

### **An example of one (of many) significant contributions to the Field**

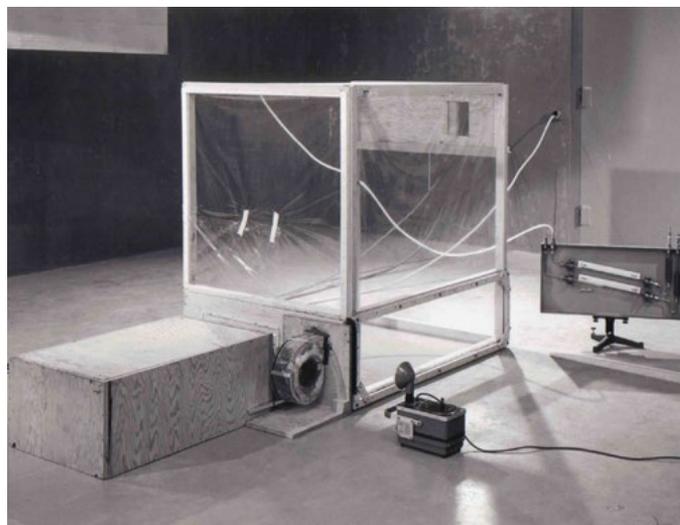
*Excerpt from presentation from Matt Nobile*

The need for a fixture to test air moving devices was recognized many years ago in the Information Technology industry. In the early 1960's, George Maling and his associates at IBM developed a plenum for the testing of such devices. Details of the plenum design were revealed to the technical community via a special session on "Measurement of Noise from Fans for Cooling Electronics" at the Internoise 1982 Conference. Then, through the efforts of the INCE Technical Committee on Information Technology Equipment Noise Emissions, the plenum was eventually standardized in ANSI S12.114 and ISO 10302. Within the technical community it has become known as the "Maling Box".

### **The Glue that held INCE-USA Together**

*Excerpt from presentation by Joe Cuschieri.*

For his presentation, Joe Cuschieri began his talk with a summary of the personal notes from Bill Lang who offered an informal account of the early years of INCE-USA. Here it is noted that George Maling "provided the glue that has held the



*The Maling Box, developed in IBM*



*Since computers and the associated cooling fans have gotten smaller over the years, we now have the so-called half-sized plenum, which can even be fully automated. And for this, we owe it all to George!*

organization (INCE/USA) together". And in addition to serving as INCE Secretary, INCE President, and General Chairman of INTER-NOISE 80 and 89, George served continuously as Editor-in-Chief of NOISE/NEWS since he published the first issue in 1972. The very first publication (Issue No. 1) of NOISE/NEWS dated 1972 January-February, featured a photo of Leo Beranek on the cover, and a lead article that was titled "INCE is Incorporated". It included photos from the ASA Conference on Noise Standards which had been held at Arden House during the period 1971 July 28-31.

## George and Noise News International

Excerpt from *George's Personal history of NNI and I-INCE* [1]

In 1971, the Institute of Noise Control Engineering (INCE/USA) was incorporated after many meetings and discussions of the need for a professional organization devoted to noise control engineering. In January of 1971 a group of American professionals met at Arden House in Harriman, New York, USA to discuss the formation of a new professional organization. It was voted to proceed with the founding of what was to become INCE/USA. The incorporation took place in June, and the first meeting of an interim Board of Directors was held in October. The organization needed some sort of a publication, and I volunteered to produce a newsletter, which I named Noise/News. The newsletter was to be published bimonthly, and the first issue was dated January-February, 1972. Noise/News was distributed at a January, 1972 organizational meeting of INCE/USA at Arden House, and we offered annual subscriptions. I remember returning from Arden House with nine subscribers! As will be seen, Noise/News was the one of the predecessors of Noise/News International.

At the October meeting mentioned above, it was agreed that an international conference should be held in 12 months, and, at the suggestion of my long-time colleague, Dr. William (Bill) Lang, it was called INTER-NOISE. The first meeting in



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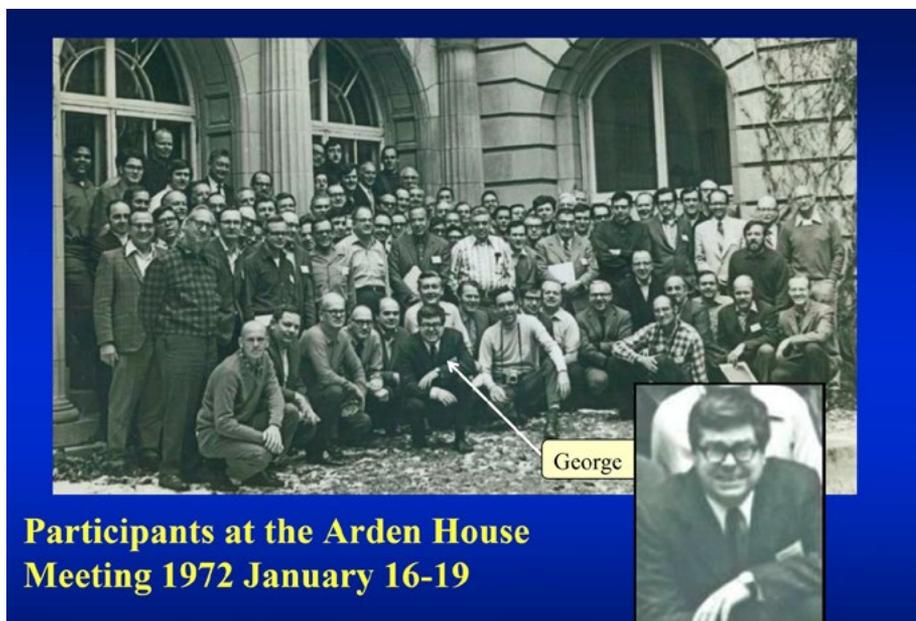
Washington, DC, USA was organized with Professor Malcom Crocker as General Chair, and was quite successful. The founders of INCE/USA had a vision of an international organization that would consist of acoustical societies and institutes of noise control engineering. Professor Fritz Ingerslev announced the formation of International INCE at the end of the opening plenary session of INTER-NOISE 74 in Washington, D.C., USA on September 30, 1974.

Shortly after the founding of I-INCE, it was recognized that the organization also needed a means to communicate, and Eric Rathé volunteered to be the editor of the International INCE Newsletter. I worked with him and supplied information of international interest from the INCE/USA publication, Noise/News.

In 1992, Bill Lang and I attended INTER-NOISE 92, which was held in Toronto, Canada. The technical publication of INCE/USA, Noise Control Engineering Journal (NCEJ), edited by Professor Crocker was, thanks to his dedicated efforts for almost 20 years, a very successful technical publication, but was having difficulty attracting advertisers. This problem was recognized by the INCE/USA Board of Directors, but no action was agreed upon. After the meeting, Bill Lang and I discussed the situation, and we concluded that it would be of benefit to both International INCE and INCE/USA to combine Noise/News and the International INCE Newsletter, and to launch a new publication.

This is how Noise/News International came about, and the first issue was published in March 1993.

[1] George C. Maling Jr., A Personal History of Noise/News International and International INCE, The Journal of the INCE of Japan, 2004, Volume 28, Issue 6, Pages 383-386. 



### Participants at the Arden House Meeting 1972 January 16-19

The participants (including George) of the 1972 Arden House meeting. From Eric Wood's 2014 presentation

## NOISE/NEWS INTERNATIONAL

A quarterly news magazine



The cover of the first issue of Noise/News International March 1993.

### The Launch of a New International Publication

When discussions began in the United States in mid-1970 about the founding of the Institute of Noise Control Engineering (INCE/USA), it became clear that the organization would need to have a means of communicating with its members. In the spring of 1971, I offered to become the editor of a new newsletter, tentatively titled *Noise/News*, which would serve as the vehicle for such communications. INCE/USA was formally incorporated in 1971 July, and plans for the new publication were put in place later in the year. The first issue of *Noise/News* was distributed at the second Arden House Workshop on Noise Control Engineering which was held in 1972 January and which marked the formal beginning of INCE/USA.

*Noise/News* covered the development of the technical program for INTER-NOISE 72 during 1972, and when, a few weeks after INTER-NOISE 72, the 92nd Congress of the United States passed the Noise Control Act of 1972, the need for a means of communicating between noise control engineers became even more important. The U.S. Environmental Protection Agency (EPA) was assigned the task of implementing the Act, and the newsletter focused on EPA activities during the 1970s and early 1980s. During the last 20 years, *Noise/News* has regularly covered the INTER-NOISE series of congresses, and other meetings in the USA.

As the editor of *Noise/News*, I have cooperated with the editor of the newsletter of International INCE since that newsletter was founded in 1975 as the communications medium for I-INCE, and some of the same information has regularly appeared in both publications. Late last year, the Board of Directors of INCE/USA empowered me to restructure *Noise/News*, and to work with the Institute of Electrical and Electronics

Engineers (IEEE) to produce a new publication. The IEEE Magazines group has an interest in assisting other engineering organizations with development of publications in their own disciplines, and now seems to be the time to accept this assistance.

Further discussions with Professor André Cops, editor of the I-INCE newsletter, lead to the development of a new magazine titled *Noise/News International*, which will now be distributed to the Member Societies of International INCE and to the members of INCE/USA.

There is no doubt in my mind that this new magazine will be much stronger than either of the previous newsletters. We have available to us the talents of the IEEE Magazines staff available for composition, layout, and advertising, the ability of Dr. Cops to cover news from Europe, and the resources to cover activities in the United States and the rest of the world. This new publication will continue to cover the INTER-NOISE series, and many of the departments in *Noise/News* will continue.

We plan to broaden our coverage of the activities of the Member Societies of International INCE, and to continue to provide information about the activities of INCE/USA. We plan to have at least one tutorial or general interest article in each issue, and to have a more coherent structure than existed in either of the previous two newsletters.

The launch of a new publication is an exciting time for all involved, and we are anxious to provide an English-language publication that will serve all of the Member Societies of International INCE. I am pleased to be associated with this new venture, and I hope that our readers are pleased with the results of our efforts.

— George C. Maling, Jr.  
Pan-American Editor



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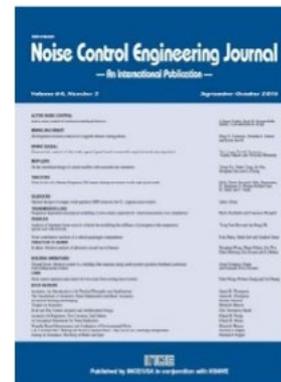
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- They do not reference cutting edge technology but provide documentation of noise control solutions



For more information: <https://www.inceusa.org/publications/noise-control-engineering-journal/>

## What is all the Noise About?

**Editor's note:** in our second contribution from Jim Thompson, he wonders why anyone would want to be a noise control engineer. As always, we'd like to hear from you as well, so please get in touch and share some of your experience. If you'd like to submit a response to Jim's column please email me at [kingea@tcd.ie](mailto:kingea@tcd.ie).

# Why Would Anyone Want to Be a Noise Control Engineer?

Jim Thompson

This may seem like a dumb question coming from a noise control engineer. However, in talking to people it seems like there are a lot of different reasons. Many of the reasons have been a surprise to me. I am interested to hear why others chose to be noise control engineers. Why people started in the field and why they stay are often different responses as well.

I have told the story of how I got into noise control before. I was a coop student and my boss told me I was going to be the office noise expert. I got interested, pursued my master's degree in room acoustics, the rest is history. This was a matter of timing: I had decided I was not going to design engines and was looking for something else when this assignment came along. When I first graduated with my MS in mechanical engineering and began looking for a job, no one was looking for noise control engineers - at least no one I could find. I ended up taking a job with the one company that was excited to find someone interested in noise control.

Throughout my career when I tell people not involved in the business that I work in noise control or that I am a noise control engineer, I get a blank look or a question like "is that a real job?" The role of a noise control professional never occurs to them until they encounter a noisy product or are confronted with an environmental noise issue. People never think about the professional who made their home appliance quieter or the startup to the new plant that they did not hear.

One positive experience I did have was several years ago. I was visiting a hotel and conference center with several professional society staff members to discuss an upcoming conference that I was chairing. This was a noise control conference, and the hotel and conference center staff were aware of the topic. When

I passed out my business cards the nature of the discussions changed. At the time, I was the Hearing Loss Prevention Branch Chief at the National Institute for Occupational Safety and Health (NIOSH). This title caught all the non-noise control attendee's attention. Several noted how significant it was that this was my job. In their minds noise control had gone from an incomprehensible engineering topic to the protection of people's health. Often, the concept or intent of what we do is more important to lay people than the technical details.

My reason for being a noise control engineer, is the opportunity to have an impact on the quality of people's lives. This is what motivates me and helps when customers seem unappreciative or the seemingly impossible is asked for with insufficient budget or time. I still feel that the noise control profession offers the opportunity to directly help people and that this is the major reason I am proud to be a noise control engineer.

Having worked for NIOSH on hearing loss prevention, I had the opportunity to interact with those impacted by hearing loss. It made me acutely aware of the reality of reduction in quality of life due to hearing loss. The thing I remember most are the interactions I had with retired miners who talked about their inability to communicate with their grandchildren. To see these "tough" men with tears in their eyes talking about how much it hurt to not be able to converse with their grandchildren was all the motivation I will ever need.

So, what was your motivation for getting involved with noise control and what keeps you motivated to pursue this obscure field we have chosen? I am curious to hear what about noise control motivates you. Why are you a noise control engineer? 



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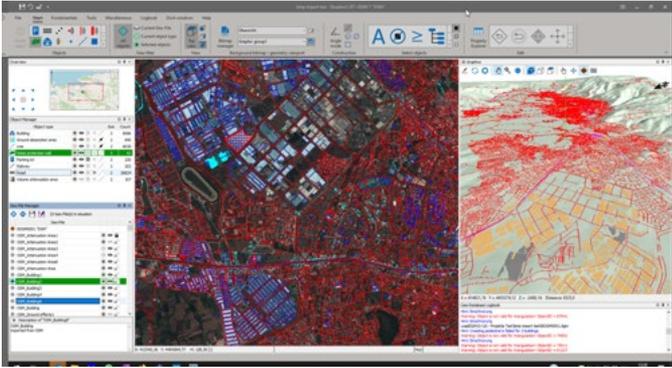
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# Product News

## Specialist software, SoundPLANnoise version 9.0 released with multiple new features for professional noise surveys and reduction strategies



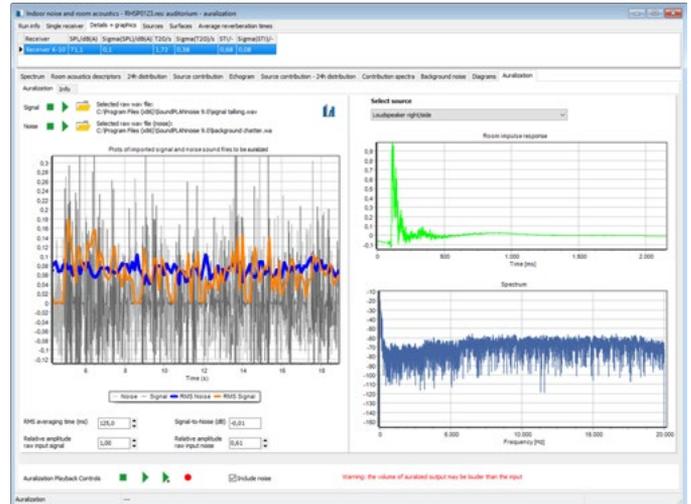
Noise-mapping specialist, SoundPLAN, has released version 9.0 of its noise mapping software.

Noise-mapping specialist, SoundPLAN, has released version 9.0 of its world-leading software, SoundPLANnoise, for effective assessment and abatement of noise in buildings and outdoors.

SoundPLANnoise 9.0 has a range of new features to model levels and dispersion of noise, to help prevent its harmful effects. The software offers answers to every conceivable question in the fields of noise immission control, environmental acoustics and room acoustics. Whether it's a construction study, transport and route planning, noise action plans, assessing open-air events, noise mapping or designing open-plan offices, the software provides the perfect solution.

Colour coded maps are created, which are very visual demonstrations of where noise comes from and how it spreads. This can be useful, especially when dealing with other planners or non-building professionals involved in the project. Using modeling, it is possible to show not only current noise levels but also projected ones. Planners can then test scenarios and assess the best options to reduce noise and protect workers and communities from its harmful effects.

The modular structure of the software allows users, quickly and easily, to adapt the program to their individual requirements. Engineers, state and local authorities, architects, concert venues, and universities all work with the effective noise software in a wide range of application areas.



SoundPLANnoise is always up to date, so that the calculations are based on the latest guidelines and standards. It is intuitive to use, enabling users to work efficiently, right through from modeling to the final graphical and tabular presentation of the results, so that goals can be reached efficiently.

New features in version 9.0 include:

- **Fully updated user interface** of the Geo-Database, where geospatial data is entered and manipulated, for a state-of-the-art user experience
- **Assessment of the harmful effects of environmental noise** (high annoyance, high sleep disturbance and ischaemic heart disease) according to EU2020/367
- **Multiple new standards** included like BEK nr 135:2019 (wind turbine), TNM 3.0 (traffic noise) and national adaptations of Common noise assessment methods in Europe (CNOSSOS-EU:2021) for strategic noise mapping
- **Meshed map calculations for time efficient indoor noise predictions** with SoundPLAN's Sound Particle Model (SPD) to analyze and evaluate acoustic properties within rooms
- **Auralization with multiple simultaneous sources** and additional background noise

For more information about SoundPLANnoise 9.0 visit: [www.soundplan.eu](http://www.soundplan.eu) or email SoundPLAN's distributor in the USA at [forschner@navcon.com](mailto:forschner@navcon.com) or contact the team at SoundPLAN's headquarters at [marketing@soundplan.de](http://marketing@soundplan.de). 

# Do-it-Yourself: Measure the noise in the venue

By Gregory Scott, Founder of SoundPrint, member of World Hearing Forum via the WHO

**\*Editors Note:** This article first appeared in the Spring 2021 edition of 'The Bottom Rung'. It is reproduced with permission.

## What will happen?

This October, participating organizations will partner with SoundPrint to engage their communities for a fun, mission-driven competition where users take sound level measurements at venues such as restaurants, bars, coffee shops, gyms and parks with the SoundPrint app and submit them to a publicly accessible database. The event and the collected data will be used to raise hearing health awareness. And many prizes will be awarded to the most dedicated participants!

Based on the collectively gathered data, SoundPrint then advocates for safe noise levels on a broad scale, including sharing the data with the WHO's World Hearing Forum and researchers. Past SoundPrint campaigns have generated hearing health awareness with thousands of participants.

## Who is participating?

Members of the WHO's World Hearing Forum, professional organizations, audiologists, speech

pathologists, hearing aid companies, noise pollution activists, acoustic experts and others will join together to raise hearing health awareness to prevent noise induced hearing loss.

## How does your organization and your constituents' benefit?

- Contribute to the mission of raising hearing health awareness!
- Create a fun, community-building activity for your constituents
- Learn how to gauge whether their environment is safe or dangerous for hearing health.
- Find quiet venues for those with hearing loss and sensory disorders to patronize
- Ask venue managers of loud places to optimize their acoustics
- SoundPrint shares the data collected by your participants
- Be featured on SoundPrint's website along with other health-minded organizations

## What you need to do?

- Reserve your spot with a "yes" via the form link below
- A month prior to the event, SoundPrint will send you everything you need to share with your community via email, social media or print in advance and during the campaign to contribute to the cause. You just copy and paste!

## How do I join?

Fill out the form that is linked [here](#). 



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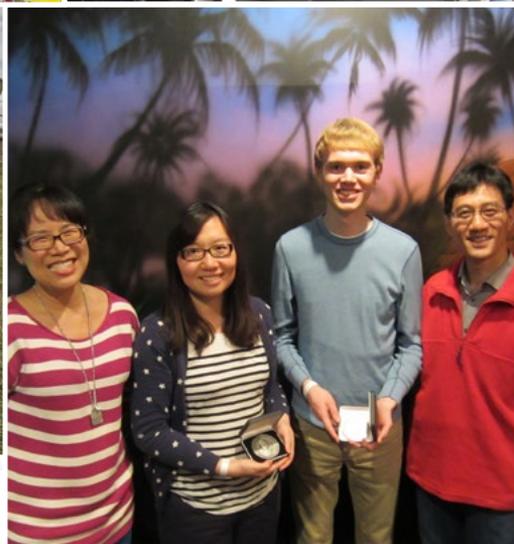
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# Book Reviews

## **The Engineering of Sport (e-book)**

Steve Haake

Published by CRC Press,

ISBN 9789054108221 (Hardback), 360pp., 300 USD ISBN

9781003078098 (eBook), 360pp., 225 USD

The e-book includes over 45 papers from a Conference on the Engineering of Sport held in UK in 1996. The book is edited by Steve Haake, Professor of Sports Engineering at Sheffield Hallam University, UK. Numerous authors from around the world presented their research (as of 1996) on a multitude of sports engineering topics ranging from aerodynamics, biomechanics, 2D and 3D motion analyses, rigid body dynamics, materials and design, vibration, and simulation and experimental studies. The rationale for this book, according to Dr Haake, is: “researchers working in sports technology find that their work falls neither in the field of traditional sports science nor in mainstream engineering. Finding a suitable forum for publishing this kind of work becomes very difficult.”

The common theme is the engineering or scientific analyses such as the static and dynamic investigations, computational motion and kinematic studies, numerical methods in fluid and solid mechanics, dimensional analyses, and statistical (regression) analyses as well as interdisciplinary studies. Papers are grouped under 9 themes (or chapters) with varying lengths, although some sports (such as golf, cricket, and selected Olympics games) are covered in several chapters. Not all sports are covered; especially US-centric sports such as football, basketball, and baseball are not even mentioned. The authors represent diverse communities from biomechanics, fluid mechanics, structural design, dynamics, material, sports science, and engineering physics communities.

The Aerodynamics part (Chapter 1) includes 3 papers that discuss the computational fluid dynamics of going faster, cricket ball swinging in the air, and the cyclist’s posture to reduce the drag. Chapter 2 on Biomechanics includes 6 papers that address spine and hip flexibility, knee mechanics, ski jump performance, and walking mechanics. The Design section (Chapter 3) contains 6 articles on the tennis racket, pole vault, bicycle frame, badminton shuttlecock, sailing yacht, and underwater

mechanics. Instrumentation aspects (Chapter 4) are covered here via 6 papers with focus on javelin release, tennis forehand, and kicking football. Next, 4 articles are included under the Materials section (Chapter 5) that describe the mountaineering equipment, cricket bat, and usage of composites or aluminum alloys. The Mechanics (Chapter 6) is the longest section with 9 papers on multidisciplinary topics covering golf balls, windsurfer mast, bobsled drivers, bow and arrow, artificial turf, bicycle chains, fishing gear, etc. The Modeling of Sport part (Chapter 7) describe the intricacies of golf balls, cricket bat, swimming, squash, rock climbing, and the like via 6 articles. Next, the Motion Analysis section (Chapter 8) includes only 3 papers on the statics and dynamics of 3D motions, water paddler study, and underwater motion analysis. Finally, the Vibration part (Chapter 9) contains 4 papers that focus on the golf clubs and cricket bats.

The e-book should be of interest to the noise and vibration control engineers (and the readers of NCEJ) for two reasons. First, from the general interest and curiosity perspective, most of us watch many games and sports while also indulging in some leisure activities ranging from walking, running, exercising, swimming, and the like. Second, there are several papers that specifically address vibration and dynamics issues. I personally enjoyed reading the book as one can arbitrarily select a theme or paper and read it without knowing other elements of the book. Articles on vibration and dynamics are quite interesting, although I would have liked to see more mathematical simulation and experimental details given my areas of interest.

Finally, the major shortcomings of this book are as follows. Information in the book is quite outdated (papers from 1996 in a book that was finally published in 2020). There is no cohesion in this book as authors simply present their own work (and do not connect the dots with other papers or chapters). Nevertheless, readers can look forward to an interesting compilation and then search the internet for related and contemporary papers on a specific sport engineering topic.

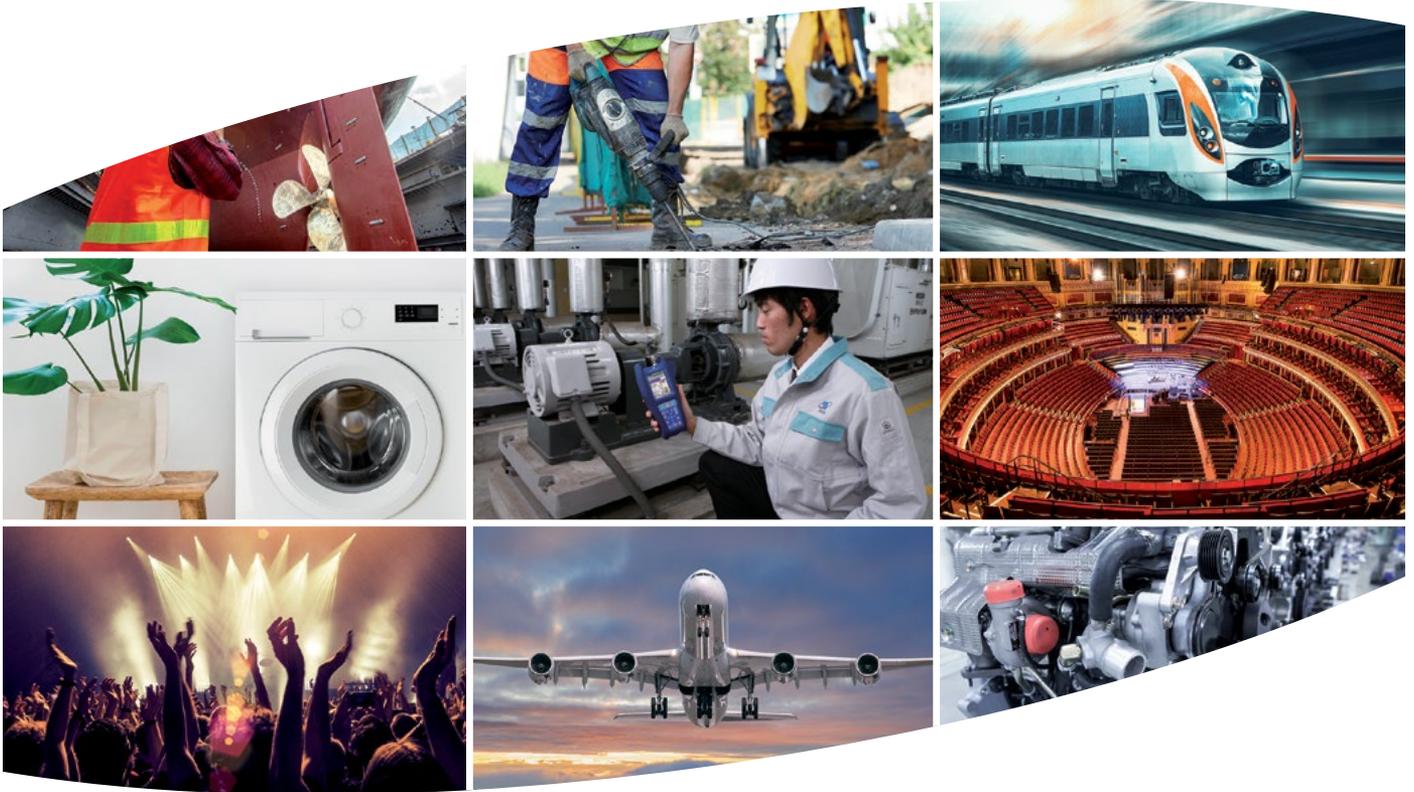
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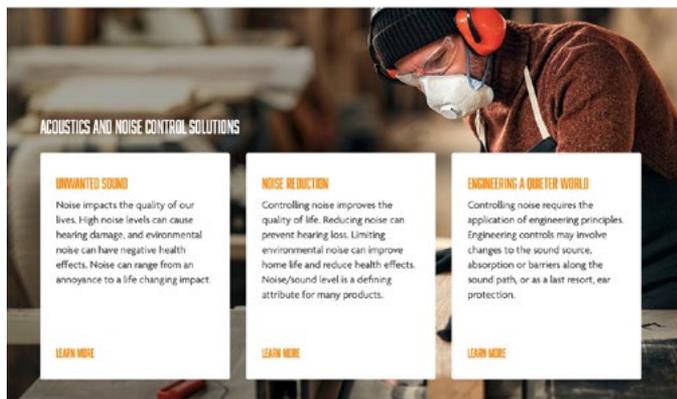
# NOISE/NOTES

Eoin A. King, NNI Editor

NNI is on Facebook and Twitter – we try to keep our readers informed with noise news from all across the globe by highlighting interesting research and projects. Here is a roundup of some of the stories that have been making headlines. Follow @NNIEditor to stay up to date with all noise related news.

## A Quieter America – A new INCE-USA Website

### A QUIETER AMERICA



INCE-USA is proud to announce the launch of a new website – **A Quieter America** – to provide knowledge about noise and noise control for the public. This is part of the INCE-USA Mission: “The Institute of Noise Control Engineering of the USA enables a quieter world through education, awareness, advocacy, and technical advancement.”

This site provides information defining noise and its impact on health and the quality of life in an easy-to-understand format for readers from school age to professionals in related fields. In addition, there is information about controlling noise with detailed information on specific noise issues. Have a look at the website here: <https://aquieteramerica.inceusa.org>

## The Acoustics of Concrete

The National Ready Mixed Concrete Association (NRMCA), in conjunction with Acentech (an acoustics and vibrations consultancy, based in Boston, MA), has produced a new guide that compiles the available data regarding the acoustical properties of concrete construction into one place. The guide has been available for free download on the NRMCA Website [here](#).

The purpose of the project was to gather the available concrete acoustic performance information into one document to make it easier to access and use in project design. Included in this database are both concrete floor-ceiling assemblies as well as concrete walls of varying construction types such as pan joist, flat slab, ICF, concrete metal deck, etc. The focus is primarily on these main types of ready mixed concrete assemblies, but also included is additional information on related structural systems, such as precast slab, wood joist, mass timber (CLT), etc. The report has also compiled the benefits of different types of available acoustical treatments for these systems, such as resilient flooring underlayment and acoustical ceiling treatments for comparison. Finally, resources for all associated acoustics topics have been compiled for users who would like further information about specific items. It will be a valuable resource for anyone working in the field.

## Marion Burgess elected as Honorary Fellow of the IOA



At the recent INTER-NOISE 2022 congress in Glasgow, the President of the Institute of Acoustics (UK) Stephen Turner, announced that Marion Burgess has been elected as an Honorary Fellow of the Institute, in recognition of her service to the field. Congratulations Marion!

## Can Noise pollution affect our mental health

A recent article published asked if noise pollution affect our mental health? The article examined the negative effects of noise on the body and mind, including for example, the noise pollution can trigger the body's stress response resulting in circulatory issues, increased pulse rate, changes in breathing, and the release of adrenaline and cortisol (fight or flight response). One Danish study cited found that residents living in multi-storey housing who indicated annoyance about neighborhood noise had experienced an "adverse impact on a broad range of physical and mental health symptoms".

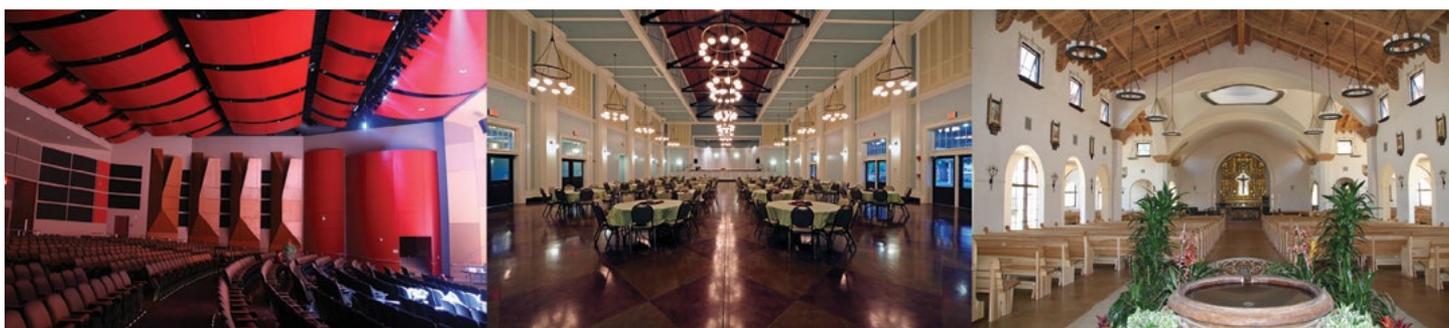
## TikTok – a new source of Noise/News

"According to TikTok..." I never envisioned writing those words, but hey, you learn something new every day! There is a new TikTok trend that suggest users listen to brown noise at night to help them sleep. According to [The Conversation](#), TikTokers

are reporting that listening to brown noise helps them relax and quickly fall into a deep sleep. It's even been reported on in the [New York Times](#), which asks if Brown Noise can 'turn off your brain'.

## UECNA to host online conference regarding aviation noise

UECNA will host a major international conference on Tackling Aviation Noise. It will be held on Zoom on 5th November from 2.00pm - 6.30pm (Brussels time). The conference is available to all, you do not need to be a UECNA member to attend. The keynote lecture will be from Marco Paviotti, Policy Officer European Commission with responsibility for noise. Overall the conference will provide updates on some key aviation noise issues, and will include speakers from four continents. 📺



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# The Value of Subjective Testing

Jim Thompson



*Tire Noise – the first time I went on a test drive to evaluate tire noise. I could not hear most of the sounds that the test engineer was talking about!*

Many noise control engineers focus on objective tests and the data provided by such tests. This is natural because of the possible distortions of subjective impressions or personal bias. At the same time many noise control engineers working in areas related to subjective response or sound quality do extensive testing to evaluate subjective responses to noise. In many of these cases, one is trying to turn subjective responses or preferences into objective data.

Most engineers are a little suspicious of subjective data. They have been trained in school to believe in hard data. All their training has been focused on how to work with such data. I thought relating some of my experiences dealing with subjective data – specifically subjective ratings by test drivers might be of interest and might even illustrate some of the strengths and weaknesses of such data.

Let me begin with when I first went to work for a tire company. I had a Ph D and nearly 10 years of experience in occupational and building acoustics at that point. Within the first week of my joining the company I was asked to go on a ride with one of the test drivers on our track. He was doing tire noise evaluations and my boss thought it would be good experience for me. It was a rude awakening for me. I could not hear most of the sounds he was talking about and rating on a 10-point scale. I could hear the difference between the 7.5 and 4.5 rated tires.

One of the smart things I did was that I went back to my boss's office and told him about my inability. He congratulated me on my honesty and suggested that I remember for the rest of my career this vital lesson. Yes, we wanted our tires to be successful for the vehicle owner, but we were designing our tires based on the ratings of our own and the automotive manufacturer's test drivers.

It is also important to note that different auto manufacturers had different test procedures that our test drivers had to match. One company ran tests on six different road surfaces to rank tires. In each case these were well defined tests that employed controls and repetition to insure repeatability. In the end these test drivers did the ratings and could reliably rank differences the public would seldom notice.

This is a good point to note that this reliance on test driver subjective ratings was a strange criterion and could lead to odd circumstances. I feel comfortable in saying that 99% of vehicle owners or occupants would not notice the differences between a 6 and 9 (out of 10) rated tires. No tire ever got a 10 rating. However, there was the one customer in 100 or 1000 that might hear this noise. This was who was driving the ratings and the test procedures.

Once I was put in charge of the acoustics group, my first assignment for every new engineer or technician was to have them go on an evaluation with one of the test drivers. The technicians would come back from that ride and freely admit they could not hear what the test driver was rating. I had to prompt most of the engineers to admit their limitations. For all it was a good lesson and helped them to understand the difficulty of our job and the skill of the test drivers.

Over time, we all learned to be proficient at subjective evaluations and worked well with the test drivers and product development engineers. The designers developing tires believed in and relied upon these subjective ratings. One of the first major successes I had working for this company was developing algorithms to convert objective sound spectra to the equivalent of test driver subjective ratings. The tire designers still had more faith in the real subjective ratings, but since we could turn around multiple tire tests in the lab in hours compared to days for tests on the track, they often accepted our estimated subjective ratings. Over time they even began to trust them.

So, does this mean I fully accept and believe in subjective ratings? Not in the least. This was a special case of highly trained

and experienced test drivers who knew multimillion dollar programs rested on their ratings. They had strict procedures, were careful, and if they were not sure of their ratings, would rerun multiple sets of tires to be sure.

So, as you may expect, there were some exceptions. During my time at the tire company, we had a very successful all-season passenger tire. It was always a challenge to make all-season tires quiet for several reasons. When we first introduced this tire, it was rated by one auto company as a 7.5. This was the highest rating ever given to an all-season tire. Four years later when we introduced a replacement for this phenomenally successful tire, it was receiving ratings of 4.5.

What had happened? The test drivers had gotten accustomed to the performance of our tire. Our competitors had made improvements. Finally, the auto manufacturers are always looking for better performance in noise and everything else. Objectively the tires performed slightly better than when they were introduced due to running improvements, but subjective ratings are subjective. By the way, this meant we had to continuously adjust our objective to subjective conversion algorithms.

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*Paying attention to the noise.. I have seen cases where subjective testing can be effective and reliable, so, I guess I believe in subjective testing but with a lot of qualifications.*

I have one more example that illustrates an important aspect of subjective ratings. Many years after leaving the tire company, I was working with a large team to develop a brake squeal measurement standard. This took years of work and the participation of brake and brake component manufacturers from around the world. In the end, a highly successful measurement standard was developed, and I wrote a book on how to do this measurement.

Now you are asking what does this have to do with subjective testing? Like tires, brakes are evaluated subjectively for noise performance by most of the auto manufacturers. Towards the end of our test specification development process, we asked each of the participants to run tests in the lab using the procedure we had developed and subjective tests to assess correlation. When we got together to review the results, there was good correlation with a few exceptions. The major exception was that one company had little to no correlation with their subjective tests.

There was a lengthy discussion as to why this one company was so different. To make a long story short, they seemed to be following similar test procedures to the other companies. However, when we discussed how frequently their test drivers' hearing was tested, they were quiet. Since brake squeal commonly occurs at frequencies of 10,000 Hz and up, even moderate hearing damage can adversely affect one's ability to hear the squeal. I found out later that his company did test their drivers' hearing and had to disqualify all from brake subjective tests.

In closing, I would say that I have seen cases where subjective testing can be effective and reliable. However, this takes care and rigid adherence to procedures and policies. So, I guess I believe in subjective testing with a lot of qualifications. **NN**

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- **OCTOBER 24–28, 2022**  
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Gyeongju, Korea
- **MAY 15–18, 2023**  
**NOISE-CON 2023, A joining conference with SAE and TRB**  
Grand Rapids, MI, USA
- **AUGUST 20–23, 2023**  
**INTER-NOISE 2023**  
Chiba, Greater Tokyo
- **SEPTEMBER 11–15, 2023**  
**Forum Acusticum**  
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*Noise Control in Buildings*, by Cyril M. Harris