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Institute of Sound and
Communications Engineers

Spring 2017

ISCE



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Introduction from our President

Phil Price *MInstSCE*



Welcome to our Spring 2017 edition of the ISCE magazine. Easter is virtually upon us and the flowers and trees are in bloom and the magazine front cover is in tune with loudspeaker daisies!

As you know, we have recently presented our best ever ISCEx

exhibition and seminar event. We preceded the exhibition with our AGM and Networking Dinner with around 110 guests enjoying the fine dining at Coombe Abbey. I would like to thank all 31 of our exhibitors for supporting ISCEx and delighted they were rewarded with an increased visitor base. We received very positive comments from both visitors and exhibitors alike and the ISCEx article in the magazine features some photos from the event.

We are pleased to confirm that we will return to Coombe Abbey on 6 and 7 March 2018 for ISCEx 2018.

While on the subject of exhibitions, I have just returned from the Frankfurt Pro Light & Sound Exhibition where some of our Supporting Members were involved. The visitor numbers seemed less, but the quality of attendee was more relevant.

ISCE will be present at PLASA FOCUS LEEDS on 9/10 May at The Royal Armouries. Plus, we will again be at ExCel London between 21–23 June for FIREX INTERNATIONAL.

You will now have received your 2017 Membership Invoices from Ros. You can sign up for payments by direct debit using 'GoCardless' (See page 26 of the magazine) We hope that the majority of our members sign up using this scheme. ISCE is again pleased to keep the existing fee levels. So with all the new activities – Training – CPD points scheme plus our increasing industry presence, I firmly believe our subscription represents outstanding value.

I hope you enjoy the magazine with the diverse technical and informative articles and I look forward to meeting many of you at the upcoming industry events. Don't forget to look at our social media pages on Facebook, LinkedIn and Twitter, as well as the website to keep up-to-date with your institute. ♦

Phil Price



Forthcoming events diary

24–28 April 2017

NAB Show

Last Vegas, USA

9–10 May 2017

PLASA Focus

The Royal Armouries, Leeds, UK

16 May 2017

ISCE training: Sound Measurement Techniques

Wakefield, UK

20–23 May 2017

AES

142nd, Berlin, Germany

7–8 June 2017

ABTT

London, UK

21–23 June 2017

FIREX International

ExCel, London, UK

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New Norwegian train station opens with EN54-16 solution from ASL

In December 2016, Sousan Azimrayat, Commercial Director and Peter Stewart, Technical Director from ASL – Application Solutions (Safety and Security) Ltd, joined the Prime Minister of Norway, local dignitaries and media at the official opening event for Holmestrand train station in Norway. Arriving by train at Holmestrand station guests were greeted by the local Mayor of Holmestrand and Knut Edmund Knutsen, project manager for Jernbaneverket (Bane NOR), the Norwegian government agency for railway services.

Holmestrand train station is a new station engineered into the mountainside of the Holmestrand municipality along a tunnel 12km in length. The celebratory events marked the completion of more than six years of construction works, numerous transport interruptions and regular noise pollution to the residents of this otherwise rural town in Norway.

The officially titled “Holm-Nykirke project”, incorporating the construction of the tunnel and the train station, began in the Summer 2010. Blasting of the rock cavern, to thirty five metres wide and eighteen metres high, commenced in December 2011 and concluded in 2014.

The station hall measuring eight hundred and seventy metres long, thirty metres wide and twelve metres high provides the Holmestrand community with valuable high-speed inter-city links.

Welcome speeches at Holmestrand station’s opening event were made by Prime Minister Erna Solberg, Mayor Alf Johan Svele and Director General Elisabeth Enger before event host Christer Torjussen handed over to live performances by Emmy from MGP Junior and Plumbo. ▶

Sousan Azimrayat, Director for ASL comments “It was a fantastic experience to be told by the Bane NOR project manager that the ASL Voice Alarm System was the first of all the telecommunication systems to be fully commissioned and working and the system sounds good”.

ASL partnered with Innotronic of Scandinavia and SAC Sweden AB to deliver a comprehensive EN54 certified public address and voice alarm (PAVA) system at Holmestrand station. Engaged by Jernbaneverket (Bane NOR) the design, supply, installation and commissioning of the new EN54 compliant PAVA systems at Holmestrand station harnesses many of the disciplines ASL offers customers.

Peter Stewart, Technical Director for ASL comments “Everyone at ASL works incredibly hard to develop and deliver our EN54 certified voice alarm products, so we’re genuinely proud to be chosen as a supplier to one of the most prestigious railway projects in Europe”.

The successful introduction of ASL’s new VIPEDIA range of products at Holmestrand is already being replicated in other stations across Bane NOR’s network with installations taking place at Oslo Airport’s Gardemoen train station.

Roy Strand, Department Manager for Bane NOR comments “Application Solutions (Safety and Security) Ltd has been a key supplier to Jernbaneverket (Bane NOR) for around ten years, delivering over 300 stations using the Vipedia and IPAM ranges of PAVA equipment. Their customer focused approach to design, manufacture and maintenance ensures we continue to work together”. ♦

www.asl-control.co.uk



New appointment at the Prolight Concepts Group



The Prolight Concepts Group, distributors of LEDJ, Equinox, Global Truss, eLumen8 and Clever Acoustics, has appointed Arena Matthewson as Regional Sales Manager for London and the South East. Arena joins the team at a time of expansion for the group and is already a familiar face, having previously worked for Avolites and TMB. “Arena is looking forward to meeting our existing customers, and welcoming new clients” says Group Managing Director, Andrew Jeffrey. ♦





The World of VoIP

By Martin Bonsoir

About 20 years ago, a few people discovered that the Internet could be used as an alternative to telephones. Rather than rely on the trusty – but quickly ageing – analogue telephone networks for voice calls, they developed methods to send audio data packets across the Internet; effectively enabling people to have a voice conversation through their Internet enabled computers. Thus, the Internet telephone was invented.

Despite the poor reliability and mediocre voice quality, these pioneers soon realised that an Internet telephone allowed them to make long distance phone calls without paying the expensive rates commanded by the analogue telephone network operators, and with far more flexibility. These are still some of the leading reasons why Voice over Internet Protocol (VoIP) continues to be one of the technologies with the fastest adoption rates in the world.

Since those humble beginnings, VoIP has become ever more sophisticated. Not only can VoIP interface with the PSTN (Public Switched Telephone Network), allowing users to make calls from a software phone to a standard phone (and vice versa), but a VoIP line can

be accessed from multiple locations, through different devices, across multiple operating systems, and through varying network connectivity.

VoIP is also easy to integrate with other services, from simple Caller ID to more advanced services like chat, screen sharing, conferencing, e-mail, and more. This allows companies to implement a telephone system that leverages their existing data network and delivers increased flexibility and productivity, while still being more affordable and easier to manage than its analogue counterpart. It really is no wonder that a growing number of organisations and companies are adopting VoIP, making it increasingly ubiquitous in the world of AV.

Babel Tower of Protocols

To AV professionals, VoIP can be daunting. It needn't be so, although there are certain concepts that need to be clearly understood if a VoIP implementation is to succeed. Let's look at some of the principles of the technology and how each part comes together.

To start with, we must understand that VoIP comes in many flavours. And the first difference we encounter ▶

is the method VoIP devices employ to talk to each other for call control and signalling purposes. Different manufacturers can, and often do, employ various protocols for this. Protocols can be likened to languages, and just like it is doubtful a Cantonese speaker will be able to communicate with someone speaking Hindi, devices using dissimilar protocols will not be able to work together.

The problem is compounded by the fact that some VoIP manufacturers use proprietary protocols. While there's nothing intrinsically wrong with proprietary protocols, it is akin to having devices speak a secret language. The result is that unless the members of the "secret language gang" allow someone else to speak their language, they will not be able to communicate with anyone outside their group.

Keeping the entirety of the installation to one manufacturer can mitigate some of these challenges, but not always. The limitations imposed by sticking to a single manufacturer may not offer the best solution to meet the customer's needs. What if, in addition to desktop telephones, we have a conference room or a huddle room to deal with? What if we need audio to be shared with a video codec? Or require local reinforcement of the microphones? Auxiliary inputs? Third party control? It is unlikely a single manufacturer will be able to cover all of the above, and therein lies the necessity for interoperability amongst brands.

SIP

SIP stands for Session Initiation Protocol, and it is the de-facto standard protocol for interoperability between manufacturers of VoIP products, enabling AV integrators to find the best solution for each problem.*

As such, when we need to interface a unit to a VoIP PBX, the first thing we need to ensure is that they are both SIP compatible. If they are, we can relax in the knowledge they will be able to communicate to each other...or will they?

* It should be noted that SIP is capable of controlling multimedia communication sessions, not just voice.

Certification

While we can be certain that devices with different communication protocols won't be compatible with each other, unfortunately, we cannot be absolutely certain that two devices supporting the same protocol (i.e. SIP) will always be compatible.

Using the language analogy again, SIP can be spoken in many different dialects. SIP specifications can be interpreted by Engineers in different ways, and those interpretations can sometimes be incompatible with each other.

For this reason, before attempting to interface two devices through SIP it is always important to check whether they have been tested for compatibility. Programs like Cisco Developer Network or Avaya DevConnect allow manufacturers to ensure their VoIP devices have their interoperability, reliability, and safety validated.

On the flip side, lack of certification doesn't immediately mean that interoperability isn't possible. If no interoperability data or certificate is available for a given VoIP endpoint and the PBX, my advice would be to first check with both manufacturers before making any promises to the customer.

Let there be audio

While SIP handles call setup and other administrative tasks, it doesn't actually deliver audio. This is done using a separate protocol (surprise, surprise!) called Real-time Transport Protocol (RTP). Its job is to transmit the audio packets between communicating devices.

But before RTP can deliver these audio packets, audio undergoes encoding.

Encoding is done because VoIP is designed to work over networks with limited bandwidth, like the Internet. Unlike professional audio systems using protocols like AVB/TSN, CobraNet®, or Dante™; VoIP doesn't have the luxury of a network that will be able to transmit uncompressed audio in a reliable manner. As such, and before audio transmission takes place, audio is compressed so that less ▶

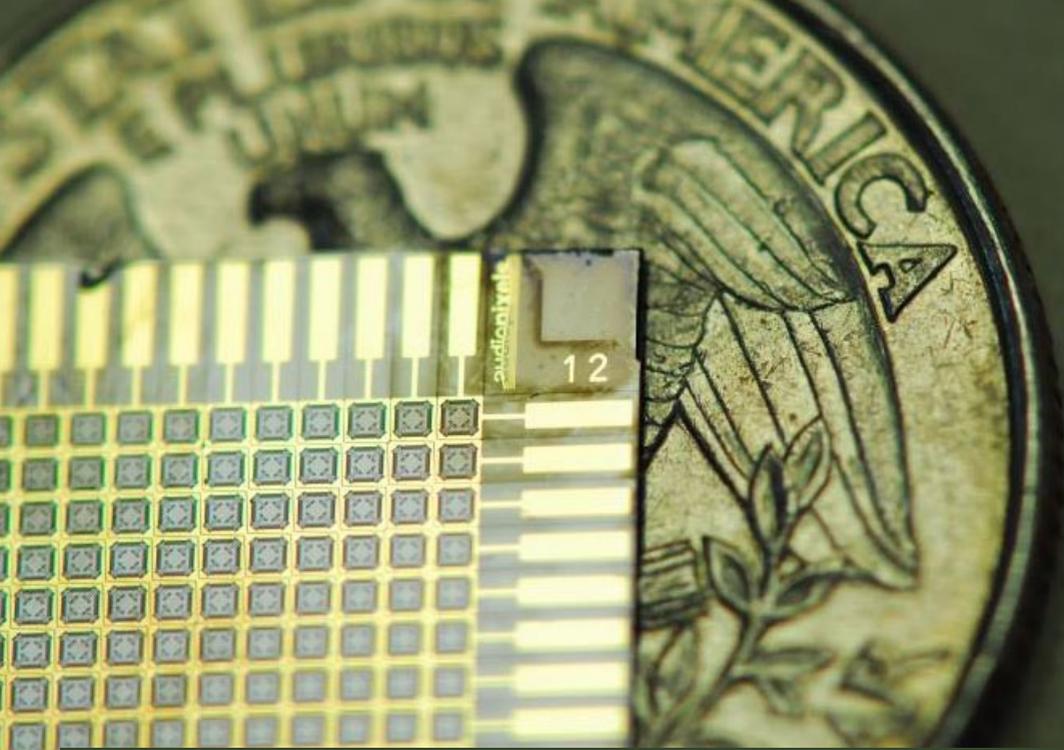
bandwidth is required for its transmission. Once it arrives at its destination, the process is reversed and audio is uncompressed. The job of encoding and decoding is done by technologies known as Codecs, and there are many different Codecs available. They vary in their bandwidth efficiency and resulting audio quality, and VoIP Systems administrators may choose one over the other depending on the individual circumstances of their system. It is common, however, for VoIP devices to support an array of Codecs and indeed one of the jobs undertaken by SIP during call setup is to agree on the Codec to be used during the communication session.

What if nothing works?

Hopefully, this article serves as a window into the world of VoIP. But no VoIP article can be complete without mentioning Wireshark@.

Wireshark is a network protocol analyser and an invaluable tool during VoIP system troubleshooting. Wireshark allows us to observe communication between VoIP devices, so should we encounter any problems during deployment, oftentimes Wireshark is the tool we need to discover where the problem lies. Just like no AV technician should leave home without a multi-meter, a good cable tester and a bag of cable ties, my advice is that anyone deploying VoIP should ensure that Wireshark is installed on their laptops. Hopefully, you may not need it. But if things aren't working, you'll surely be glad to have it at hand. ♦

www.biamp.com



The future of loudspeakers

By Roland Hemming *MInstSCE*

A new chip technology could usher in major change for the audio industry.

For as long as anyone can remember loudspeakers haven't changed. They have been packaged into many shapes and sizes, coupled together and had endless degrees of engineering refinement.

Despite some use of titanium and plastics, the loudspeaker is still essentially a piece of paper that flaps.

Ongoing effort goes into improving audio systems, making audio quality as good as possible. Yet when it gets to the last link in the chain we still rely on a moving coil of copper wire slung around a magnet. The high quality signal processing and distribution we have these days has minimal distortion and perfect frequency response but work on these niceties is then lost by the basic mechanics inside a loudspeaker.

It's like making pasta sauce; carefully selecting the freshest plumpest tomatoes and fine herbs, cooking

them gently and then just before serving, pouring in 10 cloves of garlic and half a bottle of chilli sauce.

A loudspeaker performs a simple task – it moves air. People have looked at many other ways of achieving this. Over the years I've listened to motorised drivers, crystals that expand when an electric current is passed over them, electrostatic loudspeakers and even technology that uses ultrasonic waves to direct the audio.

All of these solutions are either more expensive or less effective, or only work well for very specific applications. However, the next decade is likely to introduce a new era in loudspeaker technology.

Origin of MEMS

It all started nearly 30 years ago. In the late 1980s digital mirror projection was invented. Just 10 years after that it was a shipping project. This form of projection relies on a micro-electro-mechanical ▶

(MEMS) device. Essentially it's a chip with a bunch of moving mirrors on it. You shine a light at it and each mirror reflects or deflects the light towards the screen. With each mirror representing one pixel and moving many times a second you can project moving video.

Now another iteration of this technology is becoming available, using the same MEMS technology to create a loudspeaker.

This technology isn't even new for audio. Most laptops, smartphones and tablets use MEMS microphones. They use a chip which is covered in mechanical sensors to pick up sound. However reversing this process to reproduce sound rather than pick it up is a different deal but the technology is just being realised.

The result is a chip populated with hundreds or thousands of tiny transducers. Each of these move back and forth, compressing air to create sound waves. These chips can be reproduced in massive quantities so the price can plummet. Looking at how the cost of digital mirror projectors came down in price is only part of the story. Whilst the projector business sells in large volumes, the number of loudspeakers sold each year is hundreds of times as many. The volume manufacturing of these loudspeaker chips will be off the charts.

If you consider two for each pair of headphones, a few for each laptop, more for televisions and cars, it's possible that these could be the amongst the most mass produced chips ever.

Consumer audio will be revolutionised with truly personalised hearing for headphones and the ability to create individual beams of audio for each listener watching TV or listening in the car.

Large panels for precision

On the professional audio side, these transducer chips could be assembled together to create large loudspeaker panels. The result will give audio professionals an unprecedented level of precision. Each individual transducer can be individually controlled. Current line array technology lets you

play with the acoustic relationship between tens of transducers. The MEMS solution multiplies that by tens of thousands. You will be able to steer beams of audio with absolute precision and change the properties of the panel in realtime as content is being played.

And it will be just that – a panel that can be thin and light, able to be put in locations where you can't currently put a loudspeaker. I spend my life being asked to hide loudspeakers. With this technology, near invisible audio becomes far more achievable.

The limitation of other loudspeaker panel technologies has been their ability to reproduce lower frequencies, but the sheer number of MEMS devices in one of these arrays will enable them to work together to combine waveforms to provide high sound pressure levels across a wide frequency range.

Small versions of these loudspeakers will be connected using PoE so a single cable can provide power, digital audio and control data. The amount of power required is a fraction of a conventional loudspeaker. The quality will be far superior when each movement is under fine digital control and does not have the same mechanical restrictions of a moving coil and paper cone.

Scaling technology

This technology can be scaled from headphones through to large loudspeaker arrays.

Since it is a digital system you can accurately monitor the loudspeaker. Combining the array with MEMS microphones lets you monitor the performance remotely and much more accurately. This will transform some audio systems. Concert engineers can ensure that their system is performing optimally. Emergency audio systems can confirm that each individual element is working, assuring you that it will work in an emergency.

As with so many other technologies before them, the future of loudspeakers is probably solid state. This is the future of reproduced sound. ♦

ISE 2017: A catalyst for growth and innovation

Over four days the largest Integrated Systems Europe exhibition so far drew the world's pro AV community to Amsterdam

Amsterdam, 15 February 2017 – ISE 2017 saw 1,192 of the world's leading AV equipment vendors and service suppliers showcase the latest technology for the digital signage, unified communications, audio, smart building, residential and education sectors.

On the show floor the atmosphere was decidedly upbeat. Exhibitors, including 202 making their ISE debuts, were seen increasingly to present their products and solutions in 'real world' scenarios, designed to meet the needs of the increasing numbers of end users visiting the show.

Registered visitor attendees to ISE 2017 were at an all-time high at 73,413. This represents an 11.7% increase over the 2016 edition. Attendees came from 150 different countries, reflecting the show's global reach and influence, while almost 600 registered attendees were from the press and media.

Integrated Systems Events Managing Director Mike Blackman commented on the event's continued success: "We listen to the industry and we listen to our exhibitors. We invest in the show and, importantly, we have the people in place to produce the type

of exhibition that they tell us they need. It's a real collaborative effort and I'd like to thank everyone that's been involved."

Across 14 halls in the RAI Amsterdam, ISE 2017 delivered four record-breaking days of product launches, press briefings, awards, conferences, seminars and networking opportunities. ISE co-owners CEDIA and InfoComm International produced two packed education programmes for the residential and commercial installation market sectors. These proved to be both their most comprehensive and successful European professional development programmes to date.

Numerous exhibitors used the show to launch hundreds of new products and services and many also took the opportunity to present their exhibition stands in the most innovative and dramatic manner possible. The results were both eye-catching and inspirational.

ISE 2018 will take place at the RAI Amsterdam from 6-9 February. It will feature one more additional hall to accommodate new business. ♦

ISCEx 2017

THE BEST YET

AGM

On the 7 March, members attended the ISCE AGM and after the formalities, a really informative presentation was given by Antony Fuller of Excitech on Building Information Modelling (BIM) - what it is and how it applies to our industry. Also sharing their own BIM journey was Andy Green of C-TEC.



ISCEx Networking Dinner

That evening, ISCE members and visitors enjoyed the drinks reception and networking dinner. Our special thanks go to our sponsors of the drinks; Audio Design Services, CIE Group, NSR Communications and RCF Audio.



ISCEx 2017

A GREAT SUCCESS

We were thrilled with the increased attendance and enthusiasm for this year's annual exhibition and seminar day, ISCEx 2017, held at the stunning Coombe Abbey Hotel and Country Park on 8 March

The seminar programme was kicked off by Alberto Fuyo, Acoustic Engineer from AMS Acoustics highlighting the technical considerations required when designing PA/ VA sound systems with digital amplifiers and in particular the expected maximum sound pressure levels (SPL) compared to those traditionally experienced with analogue amplifiers.

The second seminar of the day, presented by Dr Peter Mapp, required the drafting of additional seating for a larger audience. Dr Mapp encouraged lots of participation as he embarked on demonstrating acoustic side effects of ultrasonic PA system monitoring. He highlighted examples with researched data, real-life scenarios and live demonstrations.

Dr Gillian Rollason, Social Policy Manager for Action on Hearing Loss (the charity formerly known as the RNID) concluded the day's seminars presenting a hot topic entitled, Taking Noise off the Menu - Changing the acoustic environment for diners in commercial settings. Once again audience participation proved to be lively around this highly emotive topic.



"Dr Peter Mapp's presentation was a highlight of the day for me. ISCEx is a very well planned and executed event, a credit to the Institute".

**Jim Gilroy MInstSCE,
Protec Fire Detection**



ISCEx 2017

THE BEST YET

A number of the audio industry's women also took the opportunity to gather in recognition of International Women's Day 2017.



"Coinciding with International Women's Day, it was lovely to see a greater number of women attending ISCEx 2017, supporting the sound industry and ready to celebrate our presence. As Vice President, I plan to actively encourage the Institute's increasing diversity".

Helen Goddard FInstSCE , Vice-President

With the increase in exhibitors at ISCEx this year, we saw an increased number of visitors attending as a consequence. ISCEx remains a very personal event and lends itself to creating a very intimate and informal environment. Throughout the day discussions took place between visitors and exhibitors in and around the exhibition room and throughout the hotel and grounds in various relaxed seating areas.



"A very worthwhile and well attended event, I know we certainly took away some new custom".

**Jack Wilson, FBT Audio UK,
exhibiting at ISCEx for the first time**



"To have a large number of suppliers, with the time to discuss products at length, was very beneficial".

**Dudley Simpson MInstSCE,
Simpson Sound and
Vision Ltd**



ISCEx 2017

A GREAT SUCCESS

Over recent years, ISCEx has grown steadily and for sure is an important networking event for the Sound & Communications Industry. The response to our 2017 event has really been positive from both visitors and exhibitors. We will return to Coombe Abbey again on 6 and 7 March 2018.



"A good atmosphere throughout the event and the attendance was up on last year".

**Peter Alberry-King MInstSCE,
Penton UK Ltd**



"With key decision makers from existing and potential customers in the audio industry, ISCEx isn't a huge trade show attended by thousands, it's a very compact event with key individuals and is the perfect environment to talk and develop business. We shall, without a doubt, be exhibiting next year".

Charlie Henden, Leisuretec Distribution Ltd



TO SEE MORE PHOTOS FROM THE EVENT, GO TO
WWW.ISCEX2017.ORG.UK



NSR helps the Capital say a fond farewell to the Bishop of London

NSR has a long-standing relationship with Paternoster Square that lies adjacent to London's famed cathedral, St Paul's. Working with ADI they have staged Christmas carol concerts, as well as other notable Church of England events.

Most recently the NSR team were back with ADI to provide the sound and AV for the 'pop-up' cathedral in Paternoster Square that would relay the speeches from within St Paul's cathedral during the formal service marking the retirement of the 132nd Bishop of London.

NSR supplied the stage, with lighting and full PA, on which the Bishop and a procession of 200 clergy welcomed crowds before the beginning of the service in St Paul's. Addressing the congregation, the Bishop said:

"I began life as an ink monitor in a primary school. I retire in a digital world. It's a long distance from

steel nibs and copperplate to smart apps and the Twittersphere, but it gives us an opportunity of communicating."

His words could not be more apt as the technology employed on the day by NSR gave hundreds of people the ability to enjoy the highlights of the service and take part in an historic event that only a few decades ago would have been inaccessible to the public once the doors of the cathedral closed for the start of the service.

Following the end of the service, the Bishop came to the West Doors of the Cathedral and blessed the capital and its population one last time, a mirror of the blessing he performed when he was first installed as Bishop of London. It was an event that the NSR team was very proud to be a part of. ♦

www.nsrcommunications.com

OUTSTANDING AUDIO!



SigNET's hearing loops impress at iconic landmark in Athens

SigNET's pioneering hearing loop equipment has been installed at the new £500M Stavros Niarchos Foundation Cultural Centre (SNFCC) in Athens.

Designed by renowned architect, Renzo Piano, the multi-functional education, arts and recreation complex comprises the 42-acre Stavros Niarchos Park, the National Library and the Greek National Opera. Gifted to the state by the Stavros Niarchos Foundation, the SNFCC aims to enhance the everyday lives of Greeks and attract millions of visitors from around the world.

A series of phased array hearing loop systems utilising SigNET's APPS phase shifters and PDA Pro Range Amplifiers were specified to ensure the venue is accessible to the hard of hearing.

By taking the signal from the venue's sound system, an APSS produces two signals 90 degrees out of

phase with each other. These signals are fed into two identical loop amplifiers, which are, in turn, connected to two loops laid out in a special overlapping pattern. As a result, the magnetic field is evenly spread within the covered area but the strength falls off much more quickly than normal outside the loop, thus minimising overspill.

Said Panagiotis Roussos of Telmaco, the leading Athens-based AV and Broadcast Systems Provider and Integrator, which completed the project: "We were very impressed with SigNET's phased array loops particularly the way in which they can be easily laid out in patterns to guarantee top quality standard-compliant sound. SigNET's free design and specification service is outstanding and we were very happy with the exceptional customer service provided by Tremayne Crossley". ♦

www.sig-net-ac.co.uk

Ultrasonic monitoring of PA systems – is a Code of Practice required? ISCEX seminar follow-up

By Peter Mapp PhD HonFInstSCE

Unfortunately there was little time at the end of the ISCEX lecture for questions and to discuss the implications of the survey I presented. For those of you who could not attend, I will briefly summarise the issue as far as PA & VA systems are concerned.

Background

Ultrasonic tones have been used to monitor the integrity of PA systems (and more recently VA systems) for over 35 years. Until recently, few, if any complaints have been received and it has generally been thought that the associated but unintended ultrasonic acoustic emissions were inaudible. As standard audiometric testing only measures hearing thresholds up to 8 kHz there has not been little data as to the audibility of ultrasonic sounds and their perception thresholds. However, during the past two years, a number of complaints about the ultrasonic emissions from PA systems have been made.

New information concerning high frequency thresholds and perception have also become available. These show that children and teenagers have much lower perception thresholds than adults. Furthermore, it has been established that some people are far more sensitive than others and are able to hear sounds at levels well below the perception thresholds of the average population.

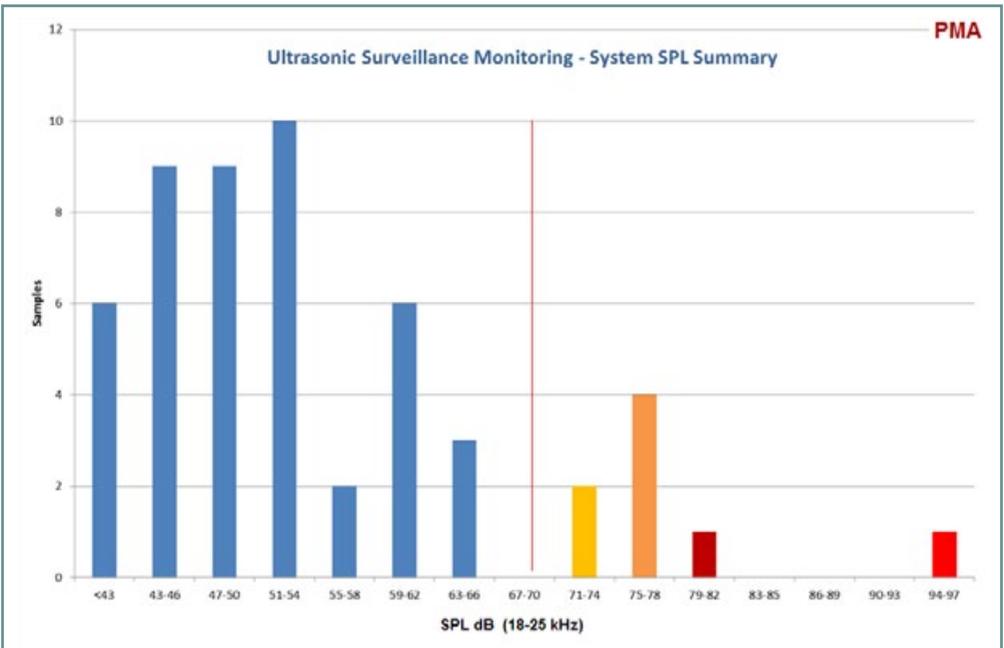
It therefore seems likely that the ultrasonic monitoring incorporated into many typical PA/VA systems could be audible to some members of the public. No research exists however as to the typical ultrasonic Sound Pressure Levels that are generated by such systems. Monitoring frequency and system voltage level information are also sparsely available. Consequently, a detailed survey was carried out by the author in order to establish the situation.

PA/VA system ultrasonic emissions review and survey

While most systems were found to employ a monitoring signal of around 20 kHz, the review found that in practice the surveillance signals ranged from 18 – 25 kHz. This is a significant range, particularly when it is considered that sounds above 23 kHz are less audible than those at 18 or 20 kHz. A range of recommended and typical surveillance voltages was also found to exist – varying typically from 2 to 10 volts for 100V line systems and from around 10mV to 100mV for active loudspeaker systems operating at a nominal audio line level of 0.775 or 1.00 Volts (0dBu/0dBV). These large variations in excitation signal, coupled with a wide range of loudspeaker sensitivities gives rise to a correspondingly wide range of emitted ultrasonic sound levels. Whilst the majority of the systems tested by the author produced sound pressure levels below 70 dB at typical listener locations, some were found to be inadvertently generating up to 94 dB SPL – a level well in excess of international exposure limits. It is therefore clear that a Code of Practice or industry guideline document is required to set or give guidance as to permissible maximum levels. In practice, due to the difficulty in accurately measuring sound pressure levels at ultrasonic frequencies, it may be more practical to set maximum surveillance voltages.

Recommended maximum ultrasonic sound levels and surveillance voltages

Recommendations proposed to BSI set the maximum SPL at 20 kHz (or over the range 17.8 to 22.4 kHz) to no more than 70 dB, with a target of < 65 dB, though in areas where the public or potential listeners are free to move around (eg circulation routes) the permissible maximum could be ▶



increased to 75 dB*. Maximum surveillance voltages should $\leq 5V$ for a 100V line distribution system – though could be increased marginally where lower operational monitoring voltages do not achieve stable surveillance,

providing that the SPL limits are not exceeded. Defining equivalent maximum levels for active loudspeaker systems is a little more difficult but a notional level of $< 50 mV$ with a maximum of $100mV$ might be appropriate.

If manufacturers or installers have any comments on the above proposals, I would be pleased to hear from them – particularly as a more detailed technical paper is being written and further research is currently being undertaken. ♦

petermapp@petermapp.com

*** These levels are in line with several international standards on ultrasound exposure levels**

ISCE

The Institute of Sound and
Communications Engineers

www.isce.org.uk

16 May 2017

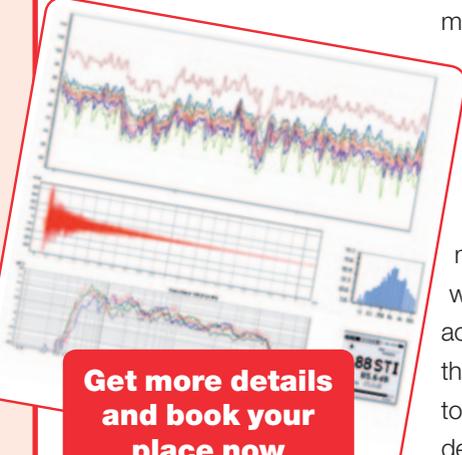
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Training Courses

Sound measurement techniques

Measuring acoustics,
noise and sound system
acoustic performance

Presenter:

Dr Peter Mapp HonFInstSCE

Learn how to measure the acoustic parameters that affect sound system performance and design

The course covers the measurement of essential acoustic design parameters such as background noise level and reverberation time. Understand noise and acoustic measurement terminology and which frequency weighting and sound level meter integration time settings to use. Learn how

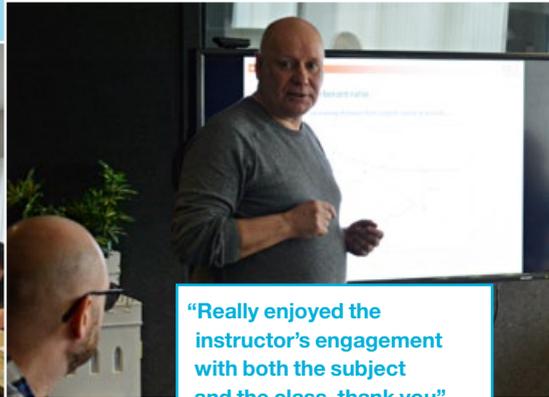
to measure the STI intelligibility performance of a sound system and the typical site issues that can affect or even invalidate the readings. Carry out, 'hands on' practical measurements in a real environment and see how measurement errors and meter calibration can affect the results. Peter Mapp will take you on a step by step journey through the acoustic measurement minefield – not only explaining the terminology and technology, but bringing this to life with a series of live practical measurement demonstrations and over 30 years of measurement and sound system design experience.

ISCE Training

This year, we have continued to deliver some excellent training that has proved very popular with our delegates. We give thanks to all of our presenters for their dedication and hard work. We also thank our members and supporting members who have offered their training facilities to us, which we fully intend to utilise in the future.

Designing for speech intelligibility

Presenter, Tony Stacey MInstSCE
26 January 2017
Production Park, Wakefield, Leeds



“Really enjoyed the instructor’s engagement with both the subject and the class, thank you”.
Rachel A.

Design & installation of hearing loop systems

Presenter, Peter Roe MInstSCE
21 February 2017
At Leisurtec’s TecZone, Leighton Buzzard

Measurement & certification of hearing loop systems

Presenter, Peter Roe MInstSCE
22 February 2017
At Leisurtec’s TecZone, Leighton Buzzard



“Good, practical discussions led and triggered by informative and supportive training material”. Simon L.

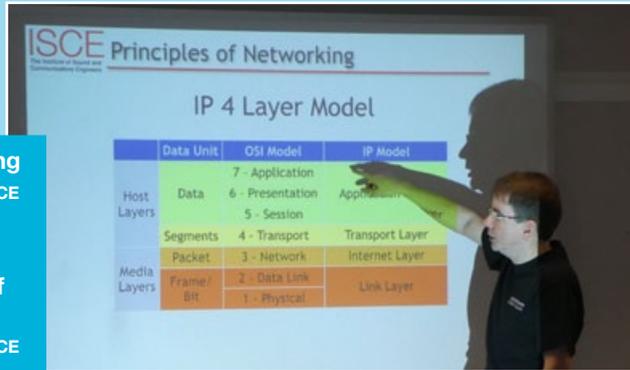


Principles of networking

Presenter, Mark Faulks MInstSCE
22 March 2017
At Highfield Park, Hook

Advanced Principles of Networking

Presenter, Mark Faulks MInstSCE
23 March 2017
At Highfield Park, Hook



We are currently planning further training on *Sound measurement techniques* with Dr Peter Mapp, *Basic electronics for sound engineers* with Bob Howard and *Hearing loop systems* with Peter Roe. Details will be sent out soon.

We are also preparing some new training courses that we hope will be ready to launch after the summer and this will include *Loudspeakers, room acoustics and listeners* which could fit well with our existing *Designing for speech intelligibility* and our *Sound measurement techniques* courses.

ISCE welcomes two new supporting members

grainger acoustics

sound and noise analysis

Grainger Acoustics Ltd

Based in Omagh in Northern Ireland, Grainger Acoustics provide an acoustic consultancy service to a variety of clients throughout Northern and Southern Ireland, from individual developers and promoters to corporate clients, Architects, M&E Consultancies, and Planning Agents. ♦

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ISCE President Phil Price, presents supporting membership certificate to Simon Kenning, Sales Manager, Roland (UK) at ISCEx 2017.

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EN 303 348

Induction loop systems intended to assist the hearing impaired in the frequency range 10 Hz to 9 kHz

This has to be written to enable Induction loop amplifiers and receivers to continue to be CE marked and placed on the market after the Radio Equipment Directive comes into force in June 2017.

The draft review stage has been completed with no objections.

The next step is for National Standards Organisations (NSO) to review and ask for public comments, which takes 90 days.

If the NSOs vote in favour of the draft and there are no technical comments, the draft will go to ETSI to make sure it meets their drafting rules.

If it does, it will be published within 10 days.

If technical comments are received they must be resolved within 60 days and a revised draft must be submitted.

EN 54-24

(Voice alarm) Loudspeakers

CEN TC72 WG23 has started to work on a standard for active loudspeakers, including large phased arrays.

The next meeting is planned for April.

EN 54-16

Voice alarm control and indicating equipment

CEN TC72 WG23 has set up a task group to work on the comments which has held three three-day meetings so far and will meet again in May.

EN 50849

Sound systems for emergency purposes that are not part of a fire alarm system

This has been published and is available to buy at the BSI shop <http://shop.bsigroup.com/SearchResults/?q=50849> or through ISCE.

BS 5839-8

Fire detection and re-alarm systems for buildings – Part 8: code of practice for the design, installation, commissioning and maintenance of voice alarm systems

BS 5839-1 (Fire alarm installation) is being revised and the Draft for Public comment will be reviewed at the next meeting of FSH/12/5 in May to see if any changes are relevant to BS 5839-8.

It is likely to be revised in order to incorporate some of the elements of its European cousin, CEN/TS 54-32, Fire detection and fire alarm systems - Part 32: Planning, design, installation, commissioning, use and maintenance of voice alarm systems.

Disclaimer

This information is believed to be correct but it is not guaranteed and neither the ISCE nor its officers can accept any responsibility in respect of the contents or any events arising from use of the information contained within this article. ♦

Membership subscription payments now available by direct debit

Several members have asked if it would be possible to pay subscriptions by direct debit. In order to facilitate such payments, Council has agreed to set up an account with GoCardless (<https://gocardless.com/>).

Members can now sign up for payments by direct debit. At first this will be limited to membership subscriptions but may be expanded in the future to include other payments.

The member sign-up process is very simple and will take place on a fully secured web page. All the normal direct debit features and guarantees will apply to the system.

GoCardless is authorised by the Financial Conduct Authority under the Payment Services Regulations 2009, registration number 597190, for the provision of payment services and their system has been recommended to us. ♦

New Members

March 2017

Senior Technician

Andrew Dunn
API Communications

Gary Kenton
GK Electronics Ltd

Ian Newton
HAES Systems Ltd

Pete Rutherford
Direct Audio Visual Ltd

Member

Martin Grainger
Grainger Acoustics Ltd

Neil Bradley
LMG

Neil Dymock
MoD

Affiliate Member

Michael Slater
EATON

Upgrade to Member

Andrew Latham
DPA Sound

New searchable Member database

Many of our members are yet to add their details to the new searchable database on the ISCE website.

If you need us to re-send an invitation to you to join, please get in touch with Ros.

It is important that you sign up soon, as the old pdf version of the Register of Members will be removed from our website in June 2017.

Second-hand PA/sound equipment available

Bernard Bibby FlntSCE has a need for some space prior to moving house.

He has an assortment of professional PA/ Sound equipment that must be found a good caring home, so if any new members to our fine profession would be interested, please send Bernard an email and he will provide you with a list of the goodies.

bernard@bibbypublishing.com



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Arup Acoustics, Manchester
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Mr D Hillier

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www.atkinsglobal.com
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Mr A Lewis

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Mr E Forth

Baldwin Boxall Communications Ltd, East Sussex
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Mr N Baldwin *AMInstSCE*

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www.biamp.com
Mr M Bonsoir

Black Light Ltd, Edinburgh
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Mr G Purvis

BL Acoustics Ltd, Essex
www.blacoustics.co.uk
Mr B Larcombe *MInstSCE*

Blaydon Communications Ltd, Tyne & Wear
www.blaydoncomms.co.uk
Mr P Dougherty *MInstSCE*

Bosch Security Systems, Middlesex
www.boschsecurity.co.uk
Mr A Osborne *AMInstSCE*

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matthew@broadcastsounds.co.uk
Mr M Tugwell

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www.canford.co.uk
Mr S Gallagher

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Mr A Downie

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Mr G Morris *MInstSCE*

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Mr M Grainger *MInstSCE*

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Ms K Wilford

Honeywell Life Safety Systems, Leicester
www.honeywell.com
Mr K Cooper

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Mr M Henden

Media Vision, London
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Mr J Williams *MInstSCE*

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Mr J Nibloe

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Mr N Clayton

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Mr D Mongey

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Nebula Audio Ltd, Worcestershire
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Dr D Tyas *FInstSCE*

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Mr A Bradshaw *TechnInstSCE*

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www.nexo.fr
Mr G Collyer

Northern Light, Edinburgh
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Mr P Walker *MInstSCE*

Paragon Data Services, East Yorkshire
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Mr I Bland

Peavey Electronics Ltd, Northants
www.peaveycommercialaudio.com
Mr J Kennedy

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www.pentonuk.co.uk
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Principle Link, Huddersfield
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Mr R Cooke

Professional Sound Consultancy, Suffolk
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Ms K Bradford

Protec Fire Detection, Lancashire
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Mr S Boivin-Champeaux

Sound Productions, Dublin
www.soundproductions.ie
Mr D McGlynn *MInstSCE*

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Mr I Bridgewater

Univox Audio Ltd, Hertfordshire
www.univoxaudio.co.uk
Mr K Hollands

Vaughan Sound Installations Ltd, Camarthenshire
www.paigroup.com
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www.vox-ignis.com
Mr A Smith *MInstSCE*

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