

# **Reproduced Sound 2016**

Proceedings of the Institute of Acoustics Volume 38 Part 2

**Southampton, United Kingdom  
15 - 17 November 2016**

ISBN: 978-1-5108-3479-8

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2016) by Institute of Acoustics  
All rights reserved.

Printed by Curran Associates, Inc. (2017)

For permission requests, please contact Institute of Acoustics  
at the address below.

Institute of Acoustics  
3rd Floor St Peter's House  
45-49 Victoria Street  
St. Albans, Hertfordshire  
AL13WZ  
United Kingdom

Phone: +44(0) 1727 848195  
Fax: +44(0) 1727 850553

[ioa@ioa.org.uk](mailto:ioa@ioa.org.uk)

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

## TABLE OF CONTENTS

<b>Developments in Wideband Transducers and Transducer Arrays with Single Source Characteristics .....</b>	1
<i>Mark Dodd</i>	
<b>Ultrasonic Surveillance Monitoring of PA Systems - A Safety Feature Or Audible Hazard? .....</b>	2
<i>Peter Mapp</i>	
<b>Stadium Sound Systems and FIFA Regulations.....</b>	18
<i>Wolfgang Ahnert</i>	
<b>Specifying Shared Application Acoustic Enhancement Systems .....</b>	28
<i>Ron Bakker</i>	
<b>Object Based Spatial and Audio Technologies for Live and Entertainment Industries .....</b>	39
<i>Bjorn van Munster, Rene Rodigast</i>	
<b>Room Acoustics and Virtual Reality: An Implementation of Auralisation and 360 Degree Image Techniques to Create Virtual Representations of Spaces.....</b>	45
<i>Alexander Vilkaitis, Mark Dring, Charles Middlicott, Bruce Wiggins, Adam J. Hill</i>	
<b>Off-Axis Cross-Talk Cancellation Evaluation of 2-Channel and 3-Channel OPSODIS Sound-Bars.....</b>	57
<i>Dylan G. Morgan, Takashi Takeuchi, Keith Holland</i>	
<b>Auditory Height Perception in Cross-talk Cancellation Using Low Order HRTF Approximation .....</b>	68
<i>Gavin Kearney</i>	
<b>The Effect on STI Results of Changes to the Male Test-Signal Spectrum .....</b>	78
<i>Glenn Leembruggen, Jan Verhav, Peter Mapp, Stefan Feistal, Ludger Holzem, Hiroshi Sato, Thomas Steinbrecher, Sander van Wijngaarden</i>	
<b>Turning Up the Background Noise: The Effects of Salient Non-speech Audio Elements on Dialogue Intelligibility in Complex Acoustic Scenes.....</b>	88
<i>Lauren Ward, Ben Shirley, William J Davies</i>	
<b>Measuring the Speech Transmission Index of Systems Featuring Digital Voice Coding.....</b>	97
<i>Jan A. Verhave, Margriet Vlot, Sander J. van Wijngaarden</i>	
<b>Cinema Sound and the Loudness Issue: Its Origins and Implications .....</b>	104
<i>Philip Newell, Julius Newell, Branko Neskov, Keith Holland</i>	
<b>Cinema Sound: How Loud is Loud? .....</b>	121
<i>Juan Battaner-Moro, Keith Holland</i>	
<b>Intelligibility of Cinema and TV Sound .....</b>	122
<i>Peter Mapp</i>	
<b>Improved Sound for Domestic TV .....</b>	140
<i>Ted Fletcher</i>	
<b>Designing an Acoustic Source of the STIPA Signal: How to Build a Good Talkbox .....</b>	146
<i>Sander J. Van Wijngaarden, Jan A. Verhave</i>	
<b>Distributed Optical Fibre Acoustic Sensors; Future Applications in Audio and Acoustics Engineering.....</b>	158
<i>Piotr Golacki, Keith Holland, A Masoudi, T P Newson</i>	
<b>Performance Change in Vocalists with Variation in Headphone Foldback and Reverberation Levels .....</b>	166
<i>Chris Barlow, Benjamin Ford, Helena Daffern, L. Yule</i>	
<b>Enhancing Audio Description: Sound Design, Spatialisation and Accessibility in Film and Television .....</b>	175
<i>Mariana Lopez, Gavin Kearney, Krisztian Hofstaedter</i>	
<b>Listener Adaptive Filtering Strategies for Personal Audio Reproduction Over Loudspeaker Arrays .....</b>	184
<i>Marcos F Simón Gálvez, Filippo Maria Fazi</i>	
<b>The Effect of Performance Stages on Subwoofer Polar and Frequency Responses .....</b>	186
<i>Adam J. Hill, Joe Paul</i>	
<b>Line Array Modelling with BEM .....</b>	197
<i>Patrick Macey</i>	
<b>Who Needs Class D! How to Make Ultra-Efficient Linear Amplifiers.....</b>	198
<i>Jamie Angus</i>	
<b>Room Correction for Object-based Audio.....</b>	211
<i>Dylan Menzies, Filippo Maria Fazi</i>	
<b>An Acoustician's Journey Into Hearing Aids .....</b>	218
<i>John O'Keefe</i>	
<b>Philharmonie De Paris: Sound System Integration and Calibration .....</b>	225
<i>Julien Laval</i>	
<b>Author Index</b>	