
MAG MAG Issue 4

March 2014



Contents

Editorial	2
MAG News	3
Events	4
MAG Events	4
Other Events	6
Featured Article	7
Perceptions of Digital Pianos and the Acoustic Elephant in the Room	7
Letters	9
LinkedIn Roundup	11
Resources	12
Picture on the Cover	13

Editorial

Hello everybody and welcome to the fourth issue of MAG MAG, the newsletter of the Institute of Acoustics Musical Acoustics Group. My name is Owen Woods and I am the editor of this publication. Not for long though, because sadly after only three issues I have found myself unable to continue due to personal commitments. This also explains why this newsletter is a touch shorter than usual! I therefore am looking for a replacement. If you are interested or if you have any questions then please contact me on ukebert@googlemail.com. The work is not unduly difficult and it's a good way of getting involved in one of the most exciting and dynamic groups in the Institute.

I have enjoyed very much my experience with MAG MAG and hope that you have enjoyed reading it!

Our planned events continue to progress - I would highlight our one day conference on 26 March 2014, for which there are a few tickets left. Definitely not one to miss. See the MAG Events section on page 4.

This issue's Featured Article on page 7 is by Christopher Stanbury and is on his adventures with Digital Pianos, in particular a beautiful example of a particular acoustic phenomenon. Thanks to Christopher for sharing that!

Mike Wright, our Chair, is still seeking information on the history of the MAG. Anecdotes, clippings, publications, photographs, all are welcome. Please see his letter to the group on page 10.

If you have anything which you think would be of interest to your fellow members then please email me on ukebert@googlemail.com. I would welcome any contribution, however small. This newsletter will only be as good as its content and that will be decided by you, the readers.

This newsletter will be published quarterly, in March, June, September and December. The deadline for submissions for the June 2014 Issue will be the **8th June 2014**.

Views expressed in MAG MAG are not necessarily the official view of the Institute of Acoustics or of the Musical Acoustics Group, nor do individual contributions reflect the opinions of the Editor. Whilst every care has been taken in the preparation of the newsletter, the publishers cannot be held responsible for the accuracy of the information herein, or any consequence arising from them. The Institute of Acoustics, MAG and Editor do not necessarily endorse the products or claims made by any contributor to this newsletter.

MAG News

The Institute of Acoustics Southern Branch in collaboration with the IOA Musical Acoustics Group and the Brighton Science Festival held a half-day meeting on a windy day in Brighton on 28th February - Creative Soundscapes 2014. Peter Rogers opened by examining the role of soundscapes within sustainable acoustic design. Jian Kang picked up on some musical elements in his presentation on the design of urban elements to improve soundscape - water as an example'. Musical elements became even more important in Trevor Cox from Salford gave a presentation based upon his new book 'Sonic Wonderland: A Scientific Odyssey of Sound' which is aimed as a 'popular science' book rather than specialist acousticians. His interesting presentation included a number of examples of Trevor's talent on an alto saxophone within some incredibly reverberant locations. Dan Pope from Atkins followed this with a presentation based upon his recent work on 'Future Sound of Cities'

During the coffee break, Michael Lowe gave an insight into his work of producing Aeolian Harps which could have considerable potential in certain soundscapes. The weather and location of the meeting did not realistically allow a live demonstration without risk of neighbourhood complaints or damage to the harps!

The meeting was attended by around 50 people and importantly, the audience included acousticians and others with an interest in the subject. This was a success which helped to publicise the aims of the IOA and its work to those outside the field.

Mike Wright, Chair of the IoA Musical Acoustics Group



Events

This section is for relevant events to group members, either devoted to Musical Acoustics or containing a significant Musical Acoustics component. If you would like to see your event listed here then please get in touch with the editor.

MAG Events

I am pleased to announce several exciting events coming up in the MAG Calendar!

Wednesday 26th March 2014, 09:30 - 17:00: Sound Recording Techniques and their Influences on Musical Composition, Interpretation, Performance and Appreciation

Musical Acoustics Group in collaboration with the Electroacoustics Group

Still a few tickets left! This is our first one-day conference of the year and is shaping up to be a fantastic event. We are again hugely indebted to Trevor Cox (as featured on BBC Radio 4), who has taken responsibility for much of the organisation. Topics range from synthesis to ambisonics and from studio design to psychoacoustics.

For more information including a full programme and to register, please click here:

<https://ioa.org.uk/civCRM/event/info?reset=1&id=11>

This event will be held at:

**Digital Performance Lab,
University of Salford
MediaCityUK,
Salford Quays,
M50 2HE**

See you there!

Wednesday 16 April 2014 at 18:00: Video Games and the Right Temperament

London Branch in collaboration with the Musical Acoustics Group

This is a repeat of the highly successful Southern Branch event held in October 2013.

Dan Pope: Calling Cthulhu: A study of the sound design process for the video game Call of Cthulhu: The Wasted Land

Mike Wright: What is the Right Temperament in Music?

This event will be held at:

**WSP,
WSP House
70 Chancery Lane
London
WC2A 1AF**

Friday 4 July 2014, 10:00 - 16:00: The Acoustics of Organs and the Buildings in which they are housed

London Branch in collaboration with the Musical Acoustics Group

We have a unique opportunity for MAG members to inspect the new organ installed in Duke's Hall of the Royal Academy of Music. I hope that you will join us for this amazing event - please click on the link below for more information and a call for papers. We are looking for abstracts of no more than 100 words by **Monday 31st March 2014**. More information to follow.

<https://ioa.org.uk/civicrm/event/info?reset=1&id=22>

This event will be held at:

**Duke's Hall
Royal Academy of Music
Marylebone Road
London
NW1 5HT**

Wednesday 15th October 2014 - Thursday 16th October 2014: 40th Anniversary Conference

Institute of Acoustics

I hope that you all know about this! The call for papers has been extended to **Friday 28th March**, so please send your 100 words to Linda on linda.canty@ioa.org.uk. There will be two sessions on Musical Acoustics and I hope to see many of you there!

<https://ioa.org.uk/sites/default/files/civicrm/persist/contribute/files/40th%20Call%20for%20Papers.p>

This event will be held at:

**Gallery Suites
Birmingham
B40 1NT**

Sunday 20 September 2015 - Wednesday 23 September 2015

The Galpin Society in collaboration with the Musical Acoustics Group

Put these dates in your diaries now! The Galpin Society is hoping to run a four day conference in Cambridge in 2015 on Musical Instruments. If the event goes ahead, one day of those four will be devoted to Musical Instrument Acoustics and will be held in collaboration with the MAG. Further information to follow in later editions...

Other Events

In this section will appear details of events of interest to MAG members. If you know of any relevant events which do not appear in this section then please get in touch.

Joint ICMC and SMC Conference 2014 - 14th-20th September, Athens, Greece

Joint between the International Computer Music Conference (ICMC) and the Sound and Music Computing Conference (SMC). Call for papers closes on the 1st April 2014. This conference will be of interest to those interested in the computing side of Musical Acoustics. For more information please see their website below:

<http://icmc14-smc14.net/submissions/papers.html>

Featured Article

If you would like to write an article for the next issue, please email the editor.

Perceptions of Digital Pianos and the Acoustic Elephant in the Room

One of my roles as a working musician is that of a consultant to a well-known Japanese manufacturer of digital pianos. As such, I am sometimes called to visit customers' houses or studios to investigate an issue which has been unable to be resolved by the firm's telephone customer support.

One such recent visit proved very interesting and was a unique demonstration of an acoustic effect which I had hitherto only read about in textbooks or experienced in laboratory conditions.

I had been called to a customer's house to investigate a problem with her new digital piano. The lady had been complaining of an uneven tonal response from the instrument, and insisted that there was one particular note that was much louder than the rest. Prior to my visit, the company had sent an engineer to change the main sound chip in the piano and even replaced and upgraded the instrument, all without any apparent improvement.

The sound from a digital piano and its perceived quality can be very subjective. Some previous customer queries about defective or unsatisfactory sound have remained unsolved, only concluding in an impasse where the customer expects more (or less) from the instrument or where the tone is simply not to their liking. I feared this latest enquiry would fit in the later category.

However, on arriving at the premises

and playing the piano, the problem was immediately apparent and as described. On the piano keyboard, the note B one octave below middle C was noticeably louder than adjacent notes, even when care was taken to depress the suspect key with equal force as the surrounding keys.

Diagnostic tests ruled out any problems with the key sensors or anything related to the operation of the instrument. This led to an interesting conclusion - that the problem was caused by an acoustic effect known as a standing wave.

There were several reasons for this hypothesis:

- The problem remained despite changing the instrument. Although the instrument was changed, the placement of the instruments remained constant in the room.
- The piano was located by the wall (where the SPL of each room node is loudest).
- The volume of the note varied according to the listener's position in the room (suggesting that room nodes were playing some part in the problem).

Although it was not possible to measure the room when visiting, subsequent reference to details of the property on an

estate agent's website stated that the distance between the wall on which the piano was located and the opposite wall was 13.5 feet.

Although it is likely that this measurement is approximate, the existence of a standing wave could be verified using the following:

The first standing wave can be calculated using:

$$f_1 = \frac{c}{2L}$$

Where c is the speed of sound (1130 ft/sec) and L the distance between opposite walls.

Multiples of these room nodes will therefore be:

$$f_2 = 83.70Hz$$
$$f_3 = 125.55Hz$$

Christopher Stanbury

As can be seen above, a standing wave will be generated in the room at 125.55 Hz, which is close to the frequency of the problem note B one octave below middle C (123.47 Hz) and within a margin of error accounting for the approximate room measurement. It is also relevant that the suspect note is close to the 3rd room node, which is most likely to be loudest closer to the wall, where the piano was located.

To test this hypothesis, the instrument was moved to a different room, where the problem disappeared.

In conclusion, I'd experienced a very interesting demonstration of how the acoustics of a music room can affect the performance of an instrument. Whilst the effect of standing waves is well known in studio acoustics, it is perhaps something which needs greater attention from music retailers and manufacturers.

Letters

This section is for open letters to the group, on any subject which you think merits discussion. If you wish to write to the group for the next issue, please contact the editor.

Dear MAG,

Sustainable Woods for Instrument Making

For those MAG members who are making musical instruments, it would be interesting to consider the sources of timber that are used. In the wider industry of musical instrument manufacture, there have been serious concerns over use of cheap illegal timber, which is an unhelpful influence on deforestation. Particular timbers of concern have been rosewood and ebony. The most popular woods for instrument manufacture seem to be spruce, maple, mahogany and ebony. Spruce is commonly used in classical strings, guitars and pianos. Hard maple is widely used for classical strings, guitars, percussion, pi-

ano and woodwind. Mahogany appears in percussion and pianos. Ebony is in classical strings, guitars and guitars. Other commonly used woods are rosewood (guitars, percussion), cherry and oak (percussion and pianos), walnut (percussion), and African blackwood and coco bolo (woodwind). It is still unclear how much of this wood is certified as coming from sustainable sources. It would be interesting to learn more from our members on their considerations in this area. Certainly a check on the certification of material is suggested – the Forestry Stewardship Council is a good starting point.

*Richard Cowell FIOA
Sustainable Design Task Force
richard.cowell@arup.com*

Dear MAG,

Pitch drift in a cappella choral singing – a PhD research project at the Open University – needs your help!

No doubt you have experienced times when your choir struggles to maintain the pitch when singing unaccompanied. In many circumstances the change passes unnoticed by the audience, if not by you, but the fact that it happens is always of concern. This research project focuses on possible causes of pitch drift other than those due to the music itself. This aspect was presented at the IOA Musical Acoustics Group July Meeting by Prof David Howard, from the University of York, with whom we are collaborating.

In order to establish some of the most likely reasons why pitch drift occurs the project needs to survey your opinions. To do this could you please complete a short questionnaire? The outcomes

of the survey, which will be completely anonymous, will inform a set of experiments. These will be undertaken with selected choirs over an extended period in their usual rehearsal venues.

Please go to <http://acoustics.open.ac.uk/pitchdrift> to access the survey. It will only take a few minutes and may be completed anonymously if you wish. However, if you want to be kept informed about the project and its progress you are very welcome to register your interest. If you would like further information about the project please email the research team at pitch-drift@open.ac.uk.

The researchers will take the opportunity to feed back their findings at appropriate points in the progress of the project.

Richard Seaton, PhD student at The Open University
Dr. Dennis Pim, lead supervisor at The Open University
Dr. David Sharp, supervisor at The Open University

Dear MAG,

You will all probably be aware from my introduction in MAG MAG issue 1 that the Musical Acoustics Group were in fact the first specialist group within the IOA. On formation of the Institute in 1974, musically inclined members of the Acoustics Group of the Institute of Physics and the British Acoustical Society had already formed what later became known as the MAG. I am pleased to note that we still have some mem-

bers of our Group who were around when the Institute came into existence. However, memories can fade with time, and from experience, these 'senior moments' crop up from time to time! The fact that IOA is approaching its 40th year has inspired some of our long-standing members, including Ralph Weston and Geoff Kerry to compile a history of the Institute for publication as part of the anniversary celebrations

next year. I was asked some time ago to find volunteers to send information so that it would be possible to write something on the history section covering the Musical Acoustics Group. The efforts of revitalising the Group have meant that efforts on searching out history took second priority. I am aware that historical stuff from Council minutes, Annual reports and Bulletins are presently being converted to electronic format. Whilst the output from these after sifting through may help form a brief overview, memories of relevant events etc may be better highlighted as separate anecdotes. These could include photos etc which will help enormously. I understand that the plan by Geoff is to produce an A4 size booklet with two columns per page. Photographs and charts may be included and "text boxes" may be used for de-

tail, anecdotes or ancillary information. The style will, in general be similar to the Bulletin.

Being a recent incumbent to the MAG, I am urgently looking for past 'memories' to include in our section on the history of the IOA. It would also seem that the archives also have some 'senior moments'. Old notes and records are not always readily to hand and what I have so far is limited. I only have the first five editions of 'Notes', Peter Dobbin's original newsletter from the early 90's. Copies of later editions would be most welcome as they do not exist in electronic form. I am also particularly looking for pre 1992 stuff which will almost certainly be in hard copy only. All contributions including 'anecdotal evidence' would be most welcome and I will look at all.

Mike Wright, MIOA

LinkedIn Roundup

The IoA MAG has a LinkedIn group where our members can discuss aspects of Musical Acoustics without waiting for the next publication of MAG MAG. You can join it here:

<http://www.linkedin.com/groups/Institute-Acoustics-Musical-Acoustics-Group-5114932>

Resources

There are various online resources on Musical Acoustics of which members may not be aware. If you find a useful website then please do email the editor and it will appear in the next edition.

Catgut Acoustical Society Journal - This journal, sadly now no longer being issued, has a wealth of information on mostly stringed instrument acoustics. The Catgut Acoustical Society (<http://catgutacoustical.org/>) in collaboration with Stanford University has now put all of the published journals and newsletters online for free. To access them go here:

<http://www.oac.cdlib.org/findaid/ark:/13030/c8gt5p1r/dsc/#ref1>

Acoustics in Practice - A new European Acoustics journal has been launched, which welcomes papers on Musical Acoustics. For more details see here:

<https://www.euracoustics.org/activities/acoustics-in-practice>

NEMO Online - For those (like me) interested in the unending problem of temperaments in music, this is an excellent resource. Those interested in this may also be interested in the SW Branch meeting where the group chair will be presenting on just such a topic (see page 4). NEMO Online's temperaments pages can be found here:

<http://nemo-online.org/bibliography/musical-scales-acoustics-temperament-and-tuning>

University of New South Wales - The UNSW website has some interesting resources on musical acoustics. Neville Fletcher (co-author of "The Physics of Musical Instruments") is an emeritus professor and their acoustics lab has done some very interesting work. Read about it here:

<http://www.phys.unsw.edu.au/music/>

Ears - Of especial interest to those involved with the Electroacoustics Group, this website also has some interesting resources on musical acoustics. See it here:

<http://www.ears.dmu.ac.uk/spip.php>

Picture on the Cover



My last "Picture on the cover" was of a Saxonette, a soprano clarinet curved like a bass clarinet. This issue my picture is of a "Jazzophone", undoubtedly one of the weirdest instruments out there. It is a standard Bb trumpet, but shaped like a Saxophone. This incidentally makes it quite tricky to play, as the weight of it pulls the mouthpiece away from the player's lips. The standard three valves are augmented by a fourth, which switches between the two bells. One bell is open, whereas the other has a wah-wah mute permanently fitted. This mute gives a very characteristic buzzy sound, very different from the open bell. The instrument is completed by a pad on a lever operated by the little finger in order to act rather like a plunger mute. So all in all a very versatile instrument in terms of the variety of sound that it can give out.

Is it worth it though? Most brass players have a collection of mutes and it isn't difficult to switch them in and out. The unique advantage of this instrument is being able to play call and response with yourself, with two different sounds. I would question just how useful that would be. Like the Echo Cornet (a similar concept of instrument) the added complexity outweighed the advantages and it swiftly drifted into obscurity.

However, we do have some now that have been restored and are playing again. This can only be a good thing, as there can't be many instruments quite as eye catching as this one! Scott Robinson, the noted multi-instrumentalist, is one such and you can see and hear him playing it by clicking on this link:

<https://www.youtube.com/watch?v=eF9PCE5mb58>

There is much information about these instruments on this excellent webpage, from which the picture was taken:

<http://marge.home.xs4all.nl/jazzophoneen.htm#.Uyrq05BFCmQ>