

THE ECHO

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Editorial



GARETH FRY, CHAIRMAN

In September 2011 we officially launched the ASD. Five years later and it still feels like we're just beginning to get the hang of running it: it's been a big learning curve for all of us. We've grown in size considerably since we launched, and expanded the scope of what we provide to our members.

From the start I've been adamant that the ASD should not exist just because it should exist, but because it should provide tangible benefits to our members and to the wider industry, both for established professionals and those breaking in to the industry.

I'm very proud of all that we've achieved in the time, not just in the sheer numbers of training seminars we've organised, or the magazines we've produced, but from the number of people who tell me that they've gotten work and met new people through our events, gained a sense of community, gained a sense that we are not alone in our endeavors.

The Echo magazine is something I am particularly proud of though. It is a unique publication, featuring the people who work in our industry and the art they create. I've always hoped that *The Echo* is a resource that you'll want to keep hold of – whether it be for advice

on VAT, or for insight into how a designer tackled a particular production, and this issue is the largest to date.

I'd like to highlight the work of Andrew Sidford, (www.madeinearrest.com) who has been the graphic designer behind *The Echo* from issue one. He has created a great visual style for the magazine that makes it unique and beautiful. As a fellow designer I can appreciate how he has deftly led us through the unknown world of graphic design and printing to get what we wanted, even when we didn't really know what we wanted.

Five years in, we're in the process of consolidating what the ASD provides, bringing the magazine, the *Herald* and our training schemes on to regular schedules. As always if you think there is anything you think we should be doing that we aren't, or something we should be doing better, we want to know.

It is also with great sadness that we lost a member this month. Rick Clarke was a friend to many of us, gave many of us our first jobs, he achieved much and did so with a gentle modesty. Chris Hedlam has written a touching obituary to him published later in this issue. Our condolences go to his friends and family.

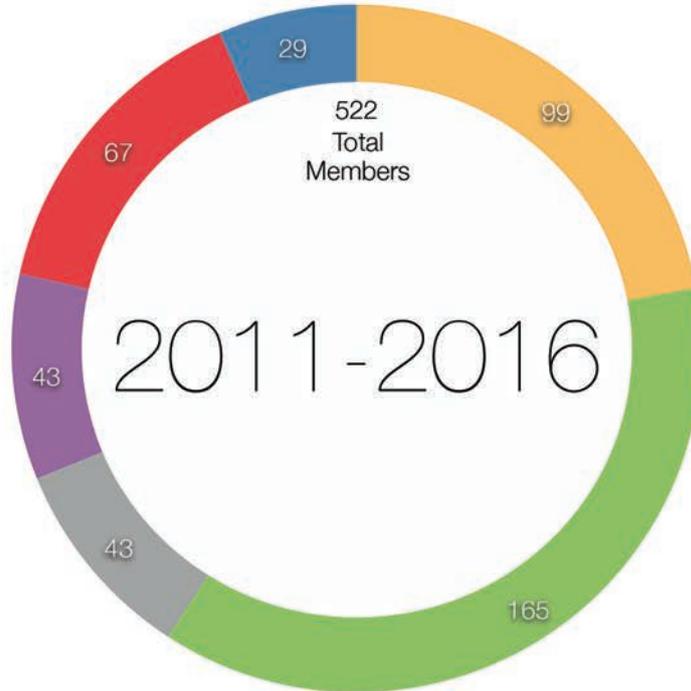


The first ASD meeting, February 2011.



- Professional Designers
- Student Members
- Corporate Members

- Professional Members
- Associate Members
- NCO Members



2011-2016



End of our first year:
120 individual members



End of our fifth year:
350 individual members

- 50 Training seminars and backstage tours
- 30 Seminars recorded, edited and available online
- 57 people received free CAD training
- 25 people received free SMAART training
- Over 500 personalised PLI certificates issued
- 48 Herald e-newsletters with over 500 news stories

- 12 Echo magazines featuring over 120,000 words of original writing about the art, process & business of sound design
- 23,930 copies of The Echo produced and circulated (excludes this issue)
- 538 Email threads on private discussion forum
- 615 posts in closed Facebook group



Meow Meow as Titiana and Nandi Bhebhe as First Fairy
in Emma Rice's *A Midsummer Night's Dream*

Showcase: A Midsummer Night's Dream



GARETH FRY

Director: Emma Rice
Sound Designer: Simon Baker
Sound Supervisor: Jay Jones
Deputy Sound Supervisor: Charlie Simpson
Sound Technicians: Maddie English and Adam Washington

The production will be live streamed on September 11th and available to watch for 60 days from then.
www.bbc.co.uk/programmes/p03fv1wr

The Globe Theatre is perhaps not what you imagine we'd be doing a sound design showcase on, given that until recently sound and lighting design were not used in their productions at all. The Globe opened in 1997 and many of its productions have to be grounded in 'original practice', that is, trying to make the experience of a show close to what it might have been in the 1600s when the original theatre existed. The Globe has recently appointed a new artistic director, Emma Rice, who is most well known for her work as artistic director of Kneehigh. Some were surprised by her appointment because she has only directed one Shakespeare play previously, and her past work doesn't bear a strong resemblance to what you might expect to see at the Globe. However for those who know her work, which is playful, often engages directly with the audience, and uses a lot of live music, she seems like a smart choice.

We interviewed sound designer Simon Baker, a regular collaborator with Emma, and started off by asking how they approached this new venture.

Simon Baker: The Globe is an amazing space. Being round it has an incredible power to it. It's completely unique, and designed for a different style, period and time of theatre, which means it has many challenges. It's sort of thrust but not quite, sort of in the round but not quite. We (Emma and her team) watched some shows at the Globe and we struggled to hear the actors words, especially when the actors turn away. There are very few surfaces that reflect sound back when the space is full of people, even the balcony fronts are open. The 270-degree wraparound of the auditorium means that unless the actor is standing centre stage facing straight out then they've always got their back to a section of the audience.

GF: Having an open roof also means you often hear helicopters flying overhead as well.

SB: Emma was keen to carry on the style of work she has been creating with Kneehigh at the Globe. Which is quite a different style of work. For example, Emma's not known for sticking rigidly to the text. We weren't sure how we could make an Emma Rice production work in the ethos of The Globe. Emma's shows are



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very close to musicals in many ways – even though they may originate as a play the music is very present at all times, and we often use mics to lift the text up above that.

Emma hadn't decided what her first show would be at this point so as a creative team – there are a group of regular collaborators – we all sat down together and thought about what we'd done in one of our most recent shows, *946*, and how we might do that at the Globe, how it might work in the repertory system.

I spent a long time trying to work out how to do the vocal reinforcement system. I knew we had to get a discrete loudspeaker into every audience box that rings the auditorium on the three levels. That is 45 d&b Eo speakers alone. Then there is the yard, where the groundlings, the audience in the standing area in front of the stage which needed covering too.

Having sat in The Globe for ages working out what to do I eventually sat down with the 3D reader in VectorWorks and started work on some different ways of achieving it. The most extreme version was a massive ground supported truss with four drops of line array on the four corners. I still love this design – as an installation piece – 21st Century Elizabethan theatre. It was extreme and a statement in itself

so quickly rejected. I kept refining and refining, some parameters Emma had set, such as keeping the decorated ceiling of the stage as clear as possible – a real challenge for LX. We also looked at a fake ceiling of painted mesh covering all the technology, we looked at removing ceiling panels – some of these decisions are likely to be revisited next season.

Eventually we got to what we've got now, which is two hangs of d&b Q1 line array with Qsubs - I'm a big fan of the Q series (I know old fashioned), plus two Meyer MSL2 embedded into the roof of the theatre. There are also more subs buried into the fake forestage, and some upstage Meyer UPJs for effects. I've gone with passive loudspeakers because they're so exposed to the elements. Everything goes into a DiGiCo SD10T and then into a Yamaha DME64. I've erred on the side of caution of using familiar kit so I could concentrate on the other aspects of the job.

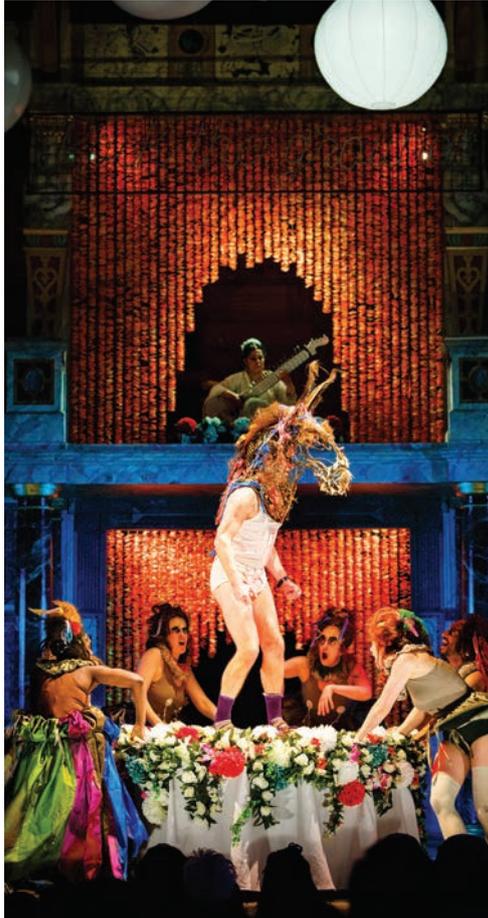
The Globe is many things to many people – it is and has to be a world class theatre, but it receives no subsidies at all so it has to pay for itself. It's also an exhibition space and visitor attraction, and an education centre for Shakespearean excellence. There's a diverse mix of people who work there with different interests and passions, from high-level

academics to producers who have to ensure the venue survives. The theatre productions have to contribute to a larger pot that supports the other work. It's a complex model.

We arrived in the last year of outgoing artistic director Dominic Dromgoole and there was this whirlwind of work going on, and so we were left to our own devices for a while. People knew we were likely to change things, and probably more so than at any point in The Globe's recent history. The theatre department actually were fine about what we were proposing doing. Some people were really excited about it. But there were a few people in other departments who were horrified, because they see the space in a different way from us. So actually the technical challenges whilst difficult weren't as hard as the political challenges.

Many people really like the original practice, the uncut text, the all male casts. There were a set of directives from the first artistic director, Mark Rylance – that no light should shine directly at an actor because that meant they then couldn't see the audience they were trying to connect with, and that no one should be radio mic'd, or rather 'amplified'. Whilst they've produced many shows at The Globe that haven't been strict original practice they've done that a lot in recent years. And not to disrespect the people who love that,

Nandi Bhebhe as First Fairy, Edith Tankus as Snug, Lucy Thackeray as Quince, Tidu Fortes as Fairy, Margaret Ann Bain as Flute and Ewan Wardrop as Bottom in Emma Rice's *A Midsummer Night's Dream*



but for the theatre to survive it has to grow and do other work too. *A Midsummer Night's Dream* was an important production to set the agenda of what to expect under Emma's tenure – to be brave, to be fun, to be witty, to be more populist. Emma wanted to recreate the spirit of Shakespeare – the excitement of the event rather than the historical accuracy. We didn't go in there wanting to do different things for the sake of it, but because it supports the productions that Emma wants to make. But of course there are a few who think what we've done is terrible by introducing lighting and sound.

What was the concept for the show?

I've been working with Emma for so long that we understand each other's aesthetic so well that we don't often talk about it. We knew it was going to be sort of set in contemporary London, that our mechanicals would start off appearing to be The Globe's FOH stewards. But also sort of set at an Asian wedding! Emma thinks up a world where the show can take place, and sometimes it's not a naturalistic world, she has a very visual approach. We often devise shows from scratch, obviously this time we had a script to start with but we used a devising process to rehearse the show, and that's integral to Emma's process.

Musically Emma wanted a Bollywood-esque feel

to the piece. She'd worked with Sitar player Shema Mukherjee before and she'd fallen in love with that sound, and what it could do. The musical landscape is so interesting that there's not much need for a lot of soundscape effects in this style of production. Really I didn't want a big flashy sound for the show, I wanted everything to sound really natural, I didn't want to detract from how The Globe sounds. This first show was also an experiment for us about how we could use this unique space. Without having to worry about lots of sound effects meant I could focus on the complex technical delivery of the show, a sound installation that had never been done in that venue before and the politics that accompanied that. There were so many hurdles to clear – where to put the front of house console being a real challenge for example.

Composer Stu Barker is another long term Emma Rice collaborator. Stu often writes in a fusion of Ska/Punk/Eastern-European styles, and he had written a lot of the musical themes before rehearsals began. We had two musicians in rehearsals full time from day one. This is really common for Emma's shows, often we have the full band in rehearsals full time and it means the music really becomes part of the shows DNA. A great connection develops between the performers and musicians, and the music flows alongside the performances. This really helps for

example in moving from an underscore to a song – it doesn't feel like a big shift.

Stu is often in the band which means he can respond really quickly and intuitively to how the show is developing over the devising process, and during performance. I've done many shows where you don't have the full band until the dress rehearsals, and it often means the music feels disconnected, part of a different world.

The band are onstage, on a mezzanine level upstage, and you've found a way for them to sit comfortably with the dialogue even though they're very close.

Fortunately none of the instrumentation is very loud acoustically: Dulcimer, Fold Harp, Guitars and Bass, except the Tablas, drum kit and Dhol, which means we can keep the dynamic in check for underscore. Actually the Sitar, which is central to the band, makes very little acoustic noise so we wouldn't have been able to use that if we hadn't had amplification. I like to keep the band on in the system all the time, even when they're doing quiet underscoring, which can be difficult to ensure it doesn't pull attention but by doing so allows us to transition to song more seamlessly. All the foldback is on headphones via Aviom which helps keep the levels down in the band area. We have lots of stations as each player plays lots of different instruments. On the

mezzanine it's actually hard to hear the actors as they have their back to you, so a key ingredient was getting vocals to the band – I honestly can't work out how this was done in the 1600s or in more recent years. We have a couple of d&b Eo's on stage for a touch of music foldback to the cast – nothing much just pitching and timing cues.

I think this is the first time a Shakespeare at the Globe had been radio mic'd

Yes, but it's nothing to do with 'actors untrained voices or projection', it's simple physics that if someone's got their back to you, with complex underscore and songs and the production would be in trouble without them. The mics mean we can be bolder with the musical underscoring than otherwise, and help with the tricky acoustics and background noise of the venue. It also feels weird to have radio mics on for a song then drop out to nothing afterwards, that creates a difficult dynamic, so it sounds better to keep them on. Not every show in the season follows this approach but it is my preference.

We had a lot of conversations about radio mic positions to make them invisible. The wigs and wardrobe departments alongside my own team were so fantastic, they really made it work. Of course, when you do a musical you take a lot for granted that everyone is looking out for

everyone else, but when you're a new department in the building or doing a play, you can't assume that. But actually everyone in the theatre department were really great. There were worries of course. For example, the sheer number of changeovers between shows mean that having additional kit to factor into that changeover can become a big issue.

We didn't have a lot of time to experiment in the space before we got in there – we had no idea what a radio mic was going to sound like, or a snare drum. It's a really busy space – with four shows playing 13 shows a week, changeovers happening often between a matinee and an evening show, and tours going through the space constantly. There is often even a matinee performance of another show during the tech rehearsal period. The band call was particularly nerve-wracking because it was the first time I really heard anything and I had no idea what would come out!

Autograph supplied everything – I knew it was going to be a difficult job, and potentially I might have to change what was needed at a moment's notice, and I wanted someone who could just fling kit in a taxi to me! We had a few unexpected things in the end, like we had to upgrade the comms system to deal with all the new staff running the shows, and a better show relay system.

We started the tech very traditionally sorting out foldback and the like. And we started very gently with the reinforcement and trying to find the right level for it, where should it sit, at what point does it overpower the story. And we tweaked that a lot over the tech and previews. A lot of the previews were also about refining the system – we'd only had a two hour slot to time the system initially. We spent time tweaking the system to work in the space, as we'd had so little time before hand, changing the angles of the line array, rebalancing and timing the system. We have four vocal zones: the yard, downstage, midstage, upstage. The band are separately timed to them on the mezzanine. The building is broadly symmetric so the delays system is paired across the auditorium which means we managed to tame the system to around 26 delay points for the under balcony delays which in turn meant we could bring the amp count down. Space backstage is tight and all our control and amplifiers are in the attic of the tiring house.

Introducing new departments meant rethinking production schedules – I think this has impacted on lighting more so than sound. We still manage to squeeze in time early morning but LX need the dark. We try and tech during the day and re-cap in real time in the evening for lighting's sake. I feel this method works well but tech time was tight before at The Globe and

adding us and lighting hasn't helped much.

How have audiences responded to the show?

The audience response has been great. A few people have complained that they can now hear things – that they used to enjoy not quite being able to hear everything. There is a vocal minority who don't like it, but we've got 1500 people in a night having a fantastic time, with very little negative feedback. There's an awful lot of people who are incredibly passionate about The Globe, and some of them got upset by the notion of what we wanted to do, even if the implementation wouldn't be something that the audience would necessarily notice. I think if our Q1 line array was more hidden, people might not be aware of the vocal reinforcement at all for the majority of the show. The first season is virtually sold out, and word of mouth has been great about it. And it was a great relief when the glowing reviews came out.

I think you've maintained the relationship between actor and audience member that Rylance was adamant about in his founding principles. Perhaps even improved it now people can hear better.

When the directors of the other shows in the rep season heard we had a sound and lighting rig, they wanted it for their shows too. So suddenly we went from doing one show with sound to something that had to serve the entire

season. George Dennis and John Leonard have designed two of the shows, and I've designed the other two. We found we needed a more complex sound system, more infrastructure, something that could rep between the requirements of those four shows. And of course that has a staffing implication.

Jay Jones has come in as sound supervisor, who I've worked a lot with on Kneehigh and it was useful that he knew the style. He came in and set up the department, I couldn't have done it without him. He also mixed *Dream* too. He brought in Charlie Simpson and Maddie English. And Adam Washington. Each has a unique skill set so within the newest sound department in London we actually have an exceptionally experienced and talented team who manage to meet the daily challenges the building throws at them.

I'm really pleased about how it's gone, and we're looking at how to refine it for next season. Again we're looking at how the space can support the artist rather than the artist having to conform to the space. It's really exciting to be doing work in this space where people are as passionate about the building, as the shows in it, which is unusual.

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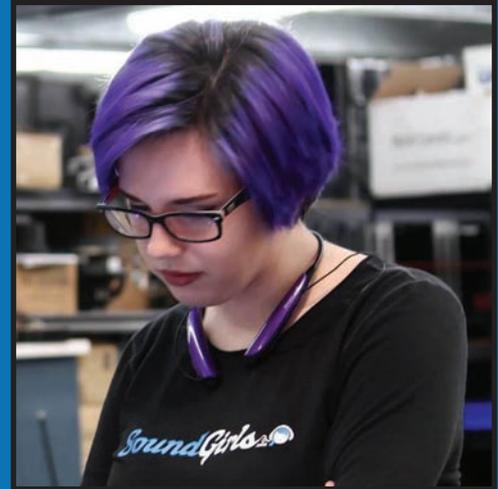
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Where are all the women?



YVONNE GILBERT

When the Association of Sound Designers asked me to look into why there aren't more women in theatre sound I started by looking at the statistics, those that existed. It's not something any organisation I could find seemed to track over a period of time.

The proportion of women and men in the ASD as listed in the public members directory is:

	Men	Women	Ratio
Student	28	14	2:1
Graduate	60	16	3.75:1
Professional	233	28	8.32:1
Designer	122	13	9.38:1

As of July 2016, excludes Associate members
There are a far bigger percentage of women in the student and graduate categories than the professional and designer categories. Why if there is a ratio of 2:1 men to women entering the industry is that dropping to 8:1 engaged in a professional career? Is there gender bias in employment trends for male and female sound engineers and designers, and how does that effect their career progression?

In the graduate category I broke down those

numbers further to see if there is any difference in the way new graduates are employed by looking at the production credits on their biographies in their ASD profiles. Some profiles had no individual credits listed so I counted them as members but counted their credits as none.

	Men	Women
Designer	16 (26.22%)	2 (12.5%)
No1/mixer/op	13 (21.31%)	3 (18.75%)
No2	6 (9.83%)	4 (25%)
No3/dep	4 (6.55%)	5 (31.25%)
Engineer/PSE	9 (14.75%)	1 (6.25%)
Technician	8 (13.11%)	1 (6.25%)

The statistics presented in this article are not the result of an extensive study, and rely on the published biographies of our members, which may not represent all the work they do. Our membership does not cover the entire industry and our membership may not appeal to everyone, making it unrepresentative of the entire industry. However we have shown these statistics to a number of industry professionals who have agreed that they do correlate to their perception of the industry.

Those 16 female graduates listed 41 employers

amongst them, which is 2.56 employers per female graduate. The 60 male graduates listed 263 employers amongst them, which is 4.31 employers per male graduate. We can see that the female graduates have fewer employers and are more concentrated in backstage roles, which are also generally lower paid. And it seems that graduate men are more likely to get a senior role compared to woman. Why is that?

When I started working in the sound department of a West End show in the early 1990's it didn't feel like there was an issue with women working in the industry. There were a few No.1s who were women and a lot more No.2s and No.3s. There weren't really any women in the production side of things that I encountered. No women on fit ups and no production sound engineers. On my first show there was a slight issue with a member of crew who wouldn't keep his hands to himself, despite being told to many times. Eventually I told the stage manager, who told the rest of the crew, who ridiculed him. That made it go away. But it didn't make the feeling that it would be wise not to be in the wing with him on my own, go away.

As I worked my way up the ranks there were less and less women around. Some women do leave the industry to have children and there is an

acknowledged problem that our industry doesn't make it easy to return as a parent. PIPA (Parents in Performance Arts) are working to try and raise this issue but there is a long way to go. There is a national problem that women earn less than men for the same jobs, leading many couples to take on male breadwinner / female childcare roles, furthering the lack of women in theatre sound. If we are focusing on the sound industry here does this mean we are acknowledging that male sound engineers are more likely to earn more than their partners, than female sound engineers are?

I really didn't encounter much hostility at work until I started to get promoted. My promotion directly led to my being told I had taken someone else's job. Someone who worked for me told me they should be my boss. I was taken off the "do you want to go for a drink" list. I was accused of bullying when I had someone disciplined for not turning up to work one evening - no phone call, no email, just didn't turn up. I was told I needed to yield more to the men I was working with - not work with, not compromise with but yield to.

A phrase I've often heard is "It's useful to have a woman on the sound team to keep backstage happy." But that perpetuates keeping women backstage and the glass ceiling firmly in place. How are you supposed to progress if you never

get to see how a show is created out front? "There's already one woman in the sound team and we like to have a balance." The women who were No.2's stayed No.2's, whilst men younger and less experienced than them leap-frogged over them into No.1 roles. "Yes he's an inexperienced No.1 but she is a very experienced No.2 so that will help support him." There is a certain logic to this, but when you are the constantly being passed over and your experience is being used to prop up the career of someone less experienced, it can appear pretty harsh. When that logic is applied time and again across the industry it results in a skewed balance of who is in which role, and who is earning more money.

Does it matter if we work backstage or FOH?

Getting to work on fit ups and in non-backstage roles gives you valuable knowledge and experience which you can use to progress your career, or to support your career. As a theatre sound engineer, mixer, designer, RF engineer, sometimes you find yourself in between contracts and many of us fill that time with other types of work. Women are typically asked to set up radio mic's, but rarely are asked to prep shows in hire stores or do fit ups - there are a few exceptions but these are exceptions. If a production is hiring ten sound people across design, fit up, etc, then setting up radio mic's is

only one role within that. There are more job opportunities for men to do fit up work and show prep, and that leads to money in the bank allowing them to ride out the lean times and stay in the industry. 21% of women in the UK, not just single women, all women due to retire, will retire into poverty in the UK. That compares with 14% of men.¹

As well as this discrimination on a career level, many females in the industry face more direct discrimination or outright sexism. In the last five years while at work: I have had my bum slapped. I have had to tell a production manager to keep his hands to himself (he was also touching and making other female members of staff feel uncomfortable). I have had to deal with a music supervisor who wouldn't keep his hands to himself. An employer told me they would rather employ a man with a family than a single woman. I have found out a different employer was paying a man doing the same job as me more because he had children (Why should someone else's life choices mean I should be penalised financially?). ? In the past I have found myself interrupted and talked over. Women are statistically much more likely to be interrupted than men.² I have been told women just aren't as good at things as men are, the "women are bad drivers because my wife crashed my car" analogy: If Jane has an accident then it proves

women are bad drivers, if John has an accident then possibly John is seen as a bad driver. But his ability to drive or not, is allowed to be his alone, it isn't used as proof that all men are bad drivers. Why is there this difference in conclusion for the same situation based on the gender of the driver?

So where are all the women?

Research has shown that the collective IQ of a team goes up when there are women in it.³ This doesn't mean women are smarter than men, it means groups get smarter when they have more women in them. So why as a graduate woman sound engineer are you less likely to get certain employment, and less likely to be employed over all? From personal experience and statistical analysis there is clearly gender discrimination, both in the number of women working in the industry, and the roles they are working in.

- Female graduates are not getting employed as much as male graduates.
- Female graduates are streamed into backstage work, and have fewer opportunities to move front of house into other roles such as design.
- Female professionals receive fewer job offers for varied types of work, meaning they have less financial resources to weather lean times.
- Female professionals find it very hard to

return to the industry after having a child.

- Female graduates and professionals alike face sexism and hostile workplaces.
- Female professionals are paid less than their male counterparts.

What can be done to improve this?

- Acknowledge the problem exists. We do not have a diverse industry. We do not work in a meritocracy. Jobs in theatre sound, and in design particularly, are primarily filled by middle class white men.
- Watch this Ted talk by a middle class white man: tinyurl.com/z465nrw
- Understand your own unconscious bias towards male and female roles, whether you are male or female. Try this test designed by Harvard.⁴ The test could show your unconscious bias toward male and female roles. If you run an organisation maybe you could suggest everyone takes the test.
- Endeavour to employ people more on merit than on gut instinct because your gut instinct is where your unconscious bias lives.
- If you work in education ensure that women in a broad spectrum of technical and creative roles are visible to your students as role models.
- Resist the common theme that the woman in the department has to always go backstage. Men can do radio mic's just as well.
- Make the work place less hostile for young

women. A 19-year-old woman walking into a workplace full of older men and porn on the walls is unlikely to feel welcome or safe.

- If discrimination bothers you then you can speak out, whether as a man or a woman. It's not solely a woman's responsibility to sort out the porn on the walls, the groping hands, the gender pay gap, the "yeah but women are rubbish at conversations." It would be really helpful if you spoke out.

- Is it necessary to employ misogynists? Would you want someone who was openly racist or homophobic on your team?

- If you are at the top of your organisation suggest that hiring and retaining women in technical and creative roles is a priority. It is illegal to discriminate in a job advert – particularly to specify a gender. Not advised against, illegal. It doesn't matter whether it is a freelance job or not, it is still illegal.

- If you are involved in recruitment in a large organisation could you 'blind audition' your application forms? When the New York Symphony Orchestra introduced blind auditioning (auditioning behind a screen with no gender identification) the percentage of women in the orchestra went up from about 10% to about 50%.

- Understand that all women are different in much the same way that all men are. All the women in the world don't have to agree on what gender equality is. Men disagree with each other

all the time. We are whole individuals with different points of view and experiences, just like men are.

- Employ women. Not a woman, women and not just in junior roles.

For women

A support network is important; women find it easy to think it's them, until they hear the same stories coming from other women.

Soundgirls is a very active organisation providing support and training, with a focus on live sound: www.soundgirls.org

WISE (Women in Stage Entertainment) has a Facebook group that can provide support from others working in theatre: tinyurl.com/gwwd33g

WISE (Women in Science and Engineering) campaigns to get more women in science and engineering careers: www.wisecampaign.org.uk

Seek out more training

It's likely as a woman over the course of your career you will be given less opportunity to experience a broad range of jobs in the industry, so get every bit of training you can get your hands on.

Start thinking about your retirement - don't be

part of the 21% women in the UK who will retire into poverty.

Why is theatre (a supposedly liberal profession) so far behind when it comes to gender balance in technical and creative roles? There have been more female engineers on the International Space Station than have been female Production Sound Engineers on a musical in the West End.

When I started out in the industry in the early 1990's there were a few women as No.1's, more as No.2 and No.3's, but no women that I came across in the production or creative side of things. I'd never heard of a female sound designer or production sound engineer. I thought I was at the beginning of a change in society and women would be equally represented and respected as sound engineers in the course of my career. This is something I hear young women today saying, 'things will be different, and things will change now'. This all should have changed significantly in the last twenty years but it hasn't. It's time to change our industry and it's up to all of us to do it.

FOOTNOTES

1 <http://tinyurl.com/zazv29r>

2 <http://tinyurl.com/ohhxggg>

3 <http://tinyurl.com/mj4bdp8>

4 <https://implicit.harvard.edu/implicit/uk/> (follow the link to the Gender study)



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THEATRE, BROADCAST, CORPORATE, COMMUNICATIONS & NETWORK AUDIO SOLUTIONS



Paul Grootius, Rich Walsh and Rick Clarke, at the first meeting of the ASD, 21 February 2011.



Rick Clarke

Rick Clarke sadly passed away on 10th of July after a prolonged period of complications from cancer.

Rick Clarke will be sorely missed. He was one of a rare breed of people – a truly gentle man with a spirit that soared, a mind that enquired and an ear that was golden. One of the most modest of men, he nevertheless made a mark on musical theatre that leaves an incredible legacy.

In the late 1960's Rick was sound-man and roadie for legendary rock band The Grateful Dead, no doubt enjoying the 60's atmosphere and gaining a broad view of life that finally evolved into intricate theatre sound design. Along the way he formed The Sound Department, a highly progressive sales and rental company that broke so many new barriers.

In 1980, Rick took up the job of head of sound at the Royal National Theatre, working there for four years before leaving as an independent sound designer. One of the iconic musicals he was designed was *Guys & Dolls* – a production that was hugely important for both The National and the West End, as it legitimised musicals in

theatre. He went on to design countless other landmark classics, *The Hired Man*, *Me & My Girl*, *West Side Story* spring immediately to mind, 42 West End Shows – and then, later on – *Chicago* – beginning an association that lasted for over 15 years, across international borders, yet so sadly curtailed. Rick's name is quite simply synonymous with *Chicago*, and *Chicago* with quality. The three go hand-in-hand.

Above all, Rick was someone prepared to try something new and to teach, to take risks in terms of advancing sound quality and adopting new technology – he never tired of getting behind a new idea, testing it out until he was satisfied that it provided something uniquely new and interesting. That is a rare quality in our industry – particularly from such an unassuming yet totally adventurous player. He relied on his

ears – not statistics nor figures – Rick was always vocal that the best measurement devices in the world were given to us for free – and the great news is we were given two!

Rick had so much experience. Experience he never kept to his chest – experience he enthused in passing on to others. The list of names who 'are where they are' and 'he gave me my first job' is so long – he supported and touched so many engineers lives in a way that is rare and priceless.

Our deepest condolences go to his wife Jenny, daughter Emelia and son Ben.

We will miss you terribly; we will miss your golden ears.

by Chris Hedlam and friends

*Never trust someone whose television
is bigger than their bookcase*



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PLASA London

PLASA Show 2016 will be returning to the heart of West London at Olympia on 18-20 September – a move backed by 85% of the show's audience.

The 39th edition of the show will deliver a renewed proposition including interactive sessions, live demos, technical workshops and increased networking opportunities plus an exclusive show party. We are excited to showcase the latest launches with leading audio brands including Aura Audio, DAS Audio, FBT Audio, FENIX, Yamaha, LMC, SSE and more...

This year's Seminar highlights have just been announced featuring thought-provoking discussions from some of the world's greatest designers, engineers, production teams and consultants.

We are thrilled to announce sessions from sound recordist Simon Bishop, discussing sound production as well as Rupert Flindt (IPS), Stephen Hughes from Delta Sound hosting 'Broadcast Meets Live Sound' and Zoe Milton's (ASD) popular 'Pin the Mic on the Actor'.

Also featuring; Jamie Gosney from Architectural Audio deliberating on concert quality sound, John M Woodgate from ISCE (hosting 'New safety standard – revolution, not evolution') and Phil Ward discussing Immersive Sound & Tablet mixing.

Don't miss out on the chance to network with like-minded professionals and learn from industry experts. Register today to attend and secure your place!

MORE INFO

**For up-to-the-minute news visit www.plasashow.com
Follow the show on Twitter at [@plasashow](https://twitter.com/plasashow)
or on Facebook at www.facebook.com/PlasaShow**



A FEW OF MY FAVOURITE THINGS

Dave Palmer is an engineer with a long history in mixing musical theatre shows.

After some years working as a general tech in local venues on the south coast, he specialised in sound and moved on to a period of touring theatre followed by primarily London-based work. He soon realised that being out front mixing was where he felt most at home and able to satisfy his 'control freak' genes and he has been found there regularly ever since.

His favourite recent mixes include *Memphis* (West End), *Merrily We Roll Along* (West End) and *I Can't Sing* (West End).



GoPro

Admittedly, it's a bit weird to start a list of favourite audio things with a video device, but this thing's useful for more than just head-mounted footage of action-based self-harm. I'm being slightly loose with the truth calling this

thing my GoPro – mine is actually one of the myriad ‘SJ Cam’ units available all over the web for a fraction of the price (which, for our purposes here, I really can’t recommend enough) and as such, I generally prefer to call it my ‘FauxPro’ or ‘NoPro’.

I bought it a few years ago after getting bored of trying to film bits of show rehearsal runs on phones and failing to catch the crucial bits seemingly always going on just out of view. The convenience of having a tiny camera you can always mount in the ideal spot – in even the most spatially challenged rehearsal room – and catch HD footage of the entire performance area is great.

In those crucial early stages of learning the cast’s names, audio implications of the blocking etc. and fully fleshing-out your VCA plot with all those random single-word lines delivered by someone at the back, having video evidence makes life so much easier – especially on shorter timescales. Of course, you can bore people with tedious questions about smaller line allocations/who’s singing a given bit in the wings, but why would you when one of these can make it seem like you have the observation skills of one of MI6’s best?! A word of warning for any timid types though – getting spotted with one of these in rehearsals will frequently delay your exit with a queue of

people wanting a copy of the files!
www.gopro.com

Lucky Red Fader Tops

Just bits of plastic, right? How very dare you! I credit these bits of plastic with every nice noise to emerge from a console they’ve been attached to (it’s worth it to watch the brief ‘What an idiot’ look on people’s faces).

About seven years or so ago, I was mixing on some particularly tired-looking fader tops for quite a while, so decided it was about time I got myself my own set of nice new 16mm, ‘Cadac-style’ P&G fader knobs – in red, obviously, as they go faster. Since then, they’ve been on my VCAs/DCA’s for everything I’ve mixed. In that time, I’ve been lucky enough to mix some great and successful gigs and nothing I’ve hated, so they’ve (ridiculously) become imbued with a genuine sense of good luck.

It started out as a joke – and it still is – but I can’t deny that some part of me feels a little bit weird standing at any desk without them under my fingers.

Friends/sound people

Two thirds of the way through your list and still not mentioned a proper piece of sound kit? Why start now?!....

Here’s the thing – we sound people are, I think, a privileged bunch. We get to do varied jobs with lots of cool toys and people who share our interests. All while there are millions of people out there squandering (only in my opinion) their lives in jobs they hate, doing things they don’t enjoy with people who don’t always form part of their friendship circle.

Moreover, as we all know very well, EVERYONE is an expert when it comes to sound. I struggle to think of another field in which you can continually strive to balance/tame a whole world of never ending variables, achieve a result with which you are fairly happy and have all your work go largely unnoticed by a public watching your work who, for the most part, only make comment if something was ‘wrong’.

This obviously isn’t to say the public’s opinion is in any way unimportant, but the situation leads to a bit of a sense of comradeship/knowing looks between sound folk that adds immeasurably to the satisfaction factor of the work.

I’ve been lucky enough to make some very close friends through making and reinforcing noises and I continue to meet like-minded people through my activities who make paying the bills fun. As such, friends/sound people is probably truly my favourite thing in this field.



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Back to basics: multiple sound sources



ANDREW JOSEPHS



RYAN PENNY

In our last article, we looked what happens to sound as it leaves a loudspeaker and travels through air. In part two we are going to take it a step further by looking at what happens when you introduce multiple sound sources, how sound covers a three-dimensional space and how to add additional loudspeakers into a system to overcome problems with audience coverage in challenging real-world environments. Let's delve into some fundamental theory when dealing with multiple sound sources.

Comb Filtering

Comb filtering is something every audio engineer will have experienced at some time, the most common example of which is the apparent tonal change you hear when two microphones on two performers in close proximity to each other are turned on.

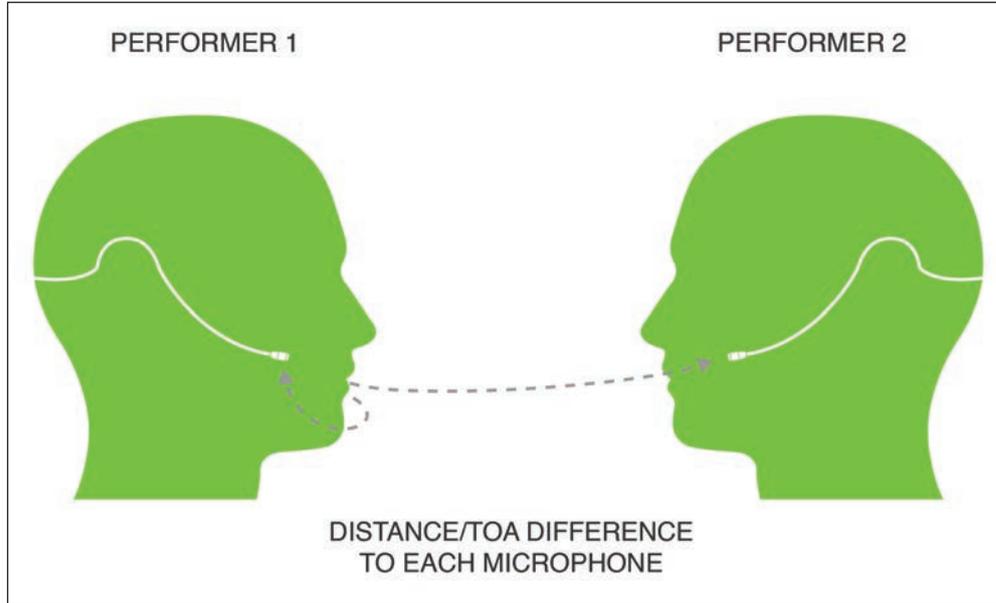
In the example our two performers each have a microphone, if Performer 1 is close enough and speaking loudly enough their voice will be picked up by both their own microphone and that of Performer 2.

If those two microphones are routed together to the same output in the mixing console then that signal will contain Performer 1 through their own microphone, plus a fraction of a second later, Performer 1 through Performer 2's microphone. The difference in distance between the performer's own microphone and their cast mate's results in a difference in the time of

arrival (ToA) at each microphone's capsule. The physics of waves tells us that if two instances of a sine wave are combined, cancellations or additions will occur depending on their phase relationship, however with complex sounds like music or the human voice these cancellations will happen at different frequencies throughout the frequency spectrum. The likely end result though is that Performer 1's mic will sound bad, with certain frequencies boosted and some reduced.

The effects of comb-filtering apply to anywhere multiple coherent sounds are combined – regardless of if the sources are voices, instruments or those reproduced by speakers. When using multiple speakers poor placement (speakers offset from one another, or causing large reflections), or different digital delay applied between two outputs on your desk's output matrix can produce sufficient time difference to result in a comb filtering at the listener.

Fig.1 Comb Filtering between two performers



In Figure 2 we can see that the top speaker is 15cm further back than the bottom one.

We can calculate the comb filtering that can occur here using this equation:

$$F_p = c/\lambda$$

Where

F_p = the first frequency peak

c = 343m/s (speed of sound at room

temperature)

λ = difference in distance between sound sources in meters

So the first peak (where the sounds combine to form a boost) will be at F_p , then the first dip will be at half the frequency of the first peak, and then these peaks and dips will continue at multiplications of these values. In our example λ

= 0.15, and so our listener would experience a comb filter with the first peak at 2287Hz (343 divided by 0.15), the first dip at 1144Hz, and then subsequent dips and peaks at each integer multiplication of these values ($\times 1,2,3$ etc). This would look like the comb-shaped diagram in Figure 3, and sound very unnatural.

It's worth mentioning that the effects of comb filtering are only audible within a certain range. If the difference in distance or ToA is very small then the peaks of the comb filter will start beyond the upper range of hearing. A difference of 1cm places the first peak at 34kHz.

Similarly, if the distance starts to become too large the peaks will become so close together that they are imperceptible. In the case of very large distances, the time is sufficient that a discrete delay is heard rather than a comb-filter. A difference of 10m places the first peak at 3.3Hz.

This example is based on a free-field environment. The distance X_m in Fig.2 isn't important in this instance as it is a constant, we are only interested in the difference in time of arrival between the sound from the two loudspeakers.

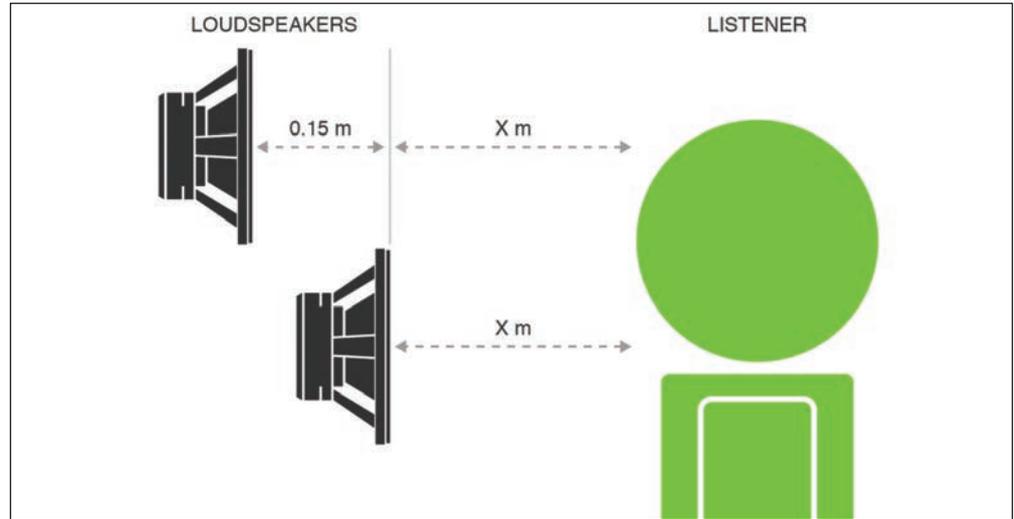
Before you now once again jump to implement

Fig.2 Comb Filtering between two loudspeakers

single speaker sound designs to reduce all of these peaks and troughs in the perfectly balanced frequency response of your hit musical's mix, it is worth noting that comb filtering is impossible to avoid in the real world, and we aren't suggesting that going to great lengths to avoid it in every way is an appropriate cause of action. Reflections are inevitable, and those same reflections and slight delays between sound sources help to create natural reverb or a sense of space in a venue, as well as allowing us to localise sound sources.

The key thing to consider is that it is difficult to make creative decisions if you're battling a system that is producing unwanted artefacts from the get go. With the exception of an anechoic chamber, all rooms will produce reflections and thus comb filtering of some kind – but being able to identify how to best place speakers in a room beyond the obvious choice of where they are pointing can be a great tool to have, especially when working in acoustically challenging spaces.

A/B systems are an efficient way of reducing the effects of comb filtering caused by open mics in close proximity to one another. In an A/B system you might have two central clusters right next to each other, with Performer 1 routed to one of them, and Performer 2 routed to the other. As



discussed, the effects of comb filtering are at their most apparent when signals are combined in 2D, as would be the case in a single mixing desk group (time and amplitude). However, by keeping the signals separated through this process and reproduced through separate loudspeakers, the sources combine in 3D (time, amplitude and space) and the effects of comb filtering are lessened – although your hire cost won't be!

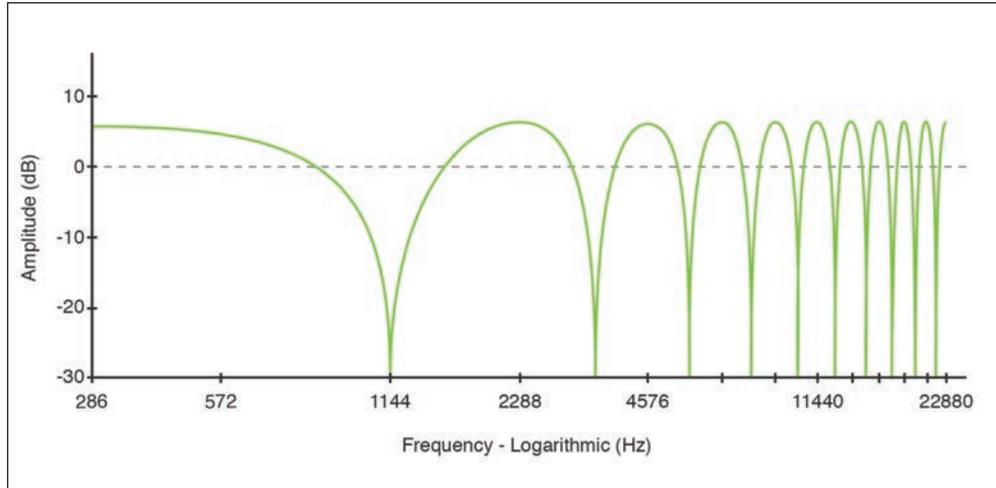
Dispersion

Not all speakers are created equal, when we

choose a speaker we mostly focus on the sound quality emanating from the front, however the sound coming from the back or side can be as important. This is something best learned first-hand by listening to different speakers in different environments and from different positions, however looking at the manufacturer's specifications can give you a clue as to what you can expect from a loudspeaker.

Loudspeaker dispersion often quoted in spec sheets, is a term normally used to describe the

Fig.3 A Comb Filter, for two sounds played at 0dB out of two speakers 15cm apart, with first peak at 2287Hz, first dip at 1144Hz.



direction sound radiates from a loudspeaker. As seen in Fig.4, this loudspeaker exhibits 90° dispersion which is simply a measurement of the point at which the SPL has reduced by 6dB from the level on-axis, this limit is referred to as the 6dB down point.

On-axis describes the area directly perpendicular to the front of a loudspeaker, i.e. where it is pointing at, and as we move around to the sides we become gradually further off-axis, with traditional loudspeaker designs, this results in a reduction of high-frequencies and

overall level. Ideally we want a loudspeaker that has an even frequency response within its dispersion angle and a consistent predictable frequency response off-axis, albeit with reduced high frequencies and level. Some boxes are better behaved than others off-axis. Good behaviour allows us to more accurately focus the loudspeaker and control the amount of unwanted sound radiated to the rear and side. A good speaker will control as much of the frequency spectrum within its stated dispersion angle as possible. There are different designs of loudspeaker enclosure that address the issue of

even dispersion across the entire frequency range. Horns, for example, have a direct correlation between the size of the aperture and the wavelength they are able to control, the larger the horn, the lower the frequency it can control goes. A physically small horn may be quite directional at high frequencies but will unlikely to be very directional at lower frequencies. A physically large horn will maintain that directivity to a much lower frequency.

Unfortunately for us, not all manufacturers measure speakers in the same way and the dispersion data doesn't always tell the whole story. High-end speakers often provide additional information such as Isobar plots which details the dispersion across the frequency spectrum or full acoustic models of their loudspeakers for inclusion into electro-acoustic simulation software, such as EASE. Many high-end manufacturers provide software that can simulate the directivity of their loudspeakers in a space.

Choosing speakers with appropriate dispersion angles is important. If you have a speaker with a much wider dispersion than needed you can end up firing sound into parts of your auditorium which don't require it, causing reflections, increasing the reverberant level of

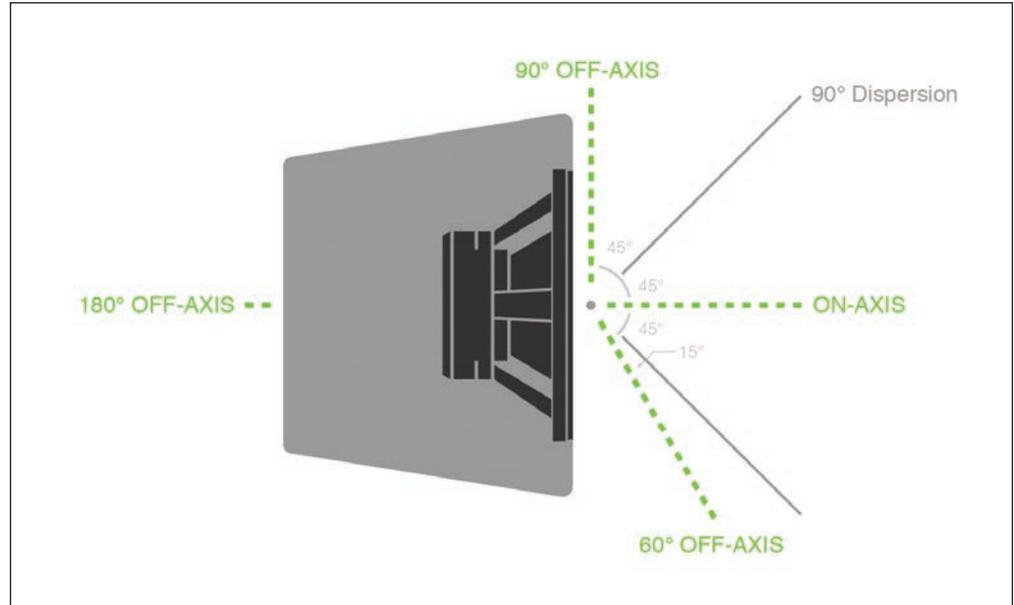
Fig.4 Loudspeaker dispersion

sound in the room, lowering your critical distance, and producing unwanted artefacts such as comb filtering for your audience.

Localisation using the Precedence Effect

When it comes to live audio for theatre, absolute accuracy is not always the most artistically pleasing. The Precedence Effect is a prime example, it's a psychoacoustic (how the brain perceives sound) principle describing how we interpret repetitions of the same sound in quick succession.

If we play two identical clicks, or any sound consisting largely of a sharp transient, with a gap between them of less than 5ms our brain will interpret them as a single sound, it will fuse them together albeit with added artefacts. If that gap is larger than 5ms, it will sound like two separate sounds. For music and more complex sounds, this time difference increases to 40ms (or even higher) before the two sounds are perceived as distinctive and recognisably separate wavefronts. As we looked at earlier, playing two pieces of music with a delay of less than 5ms will produce comb filtering. Now, this isn't an exact science, and the exact timings differ in various research papers depending on the material used, however these values are generally accepted as standards.

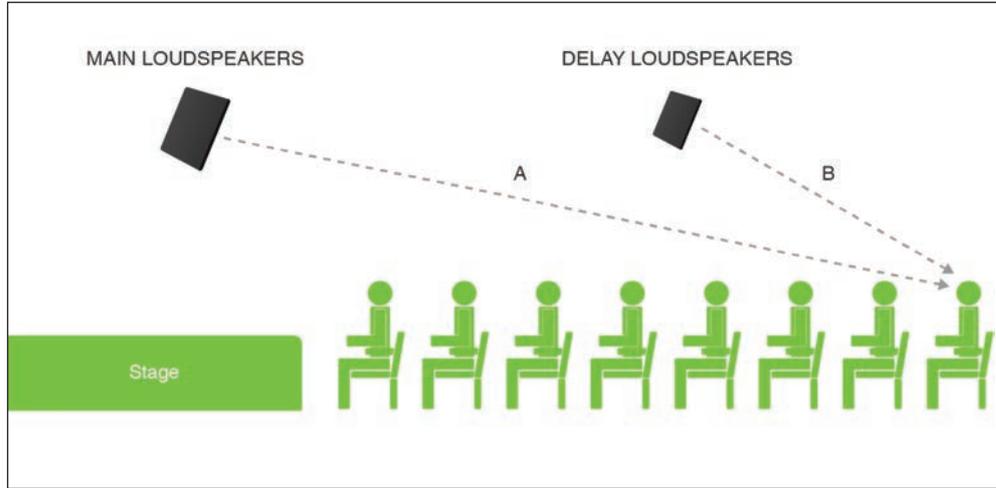


The original and subsequent research into this area has found that when presented with two wavefronts delayed within such timeframes (i.e. fused), the sound will be localised to the first wavefront, with the second only having a small impact on how we perceive the location of the sound. Some research suggests that the second sound can be between 10-15dB louder before the precedence effect begins to fail, and the first

waveform stops being the main factor in how we localise sounds.

As we discussed in the first article, SPL reduces as distance from the source increases. Whilst it is sometimes possible to overcome this with careful positioning there are often limitations as to where loudspeakers can be placed within a venue, what's more, the design of most theatres

Figure 5 Precedence Effect: In theatre this principal allows us to manipulate where the audience thinks a sound is coming from, also known as localisation.



often focuses around maximising the sight lines for maximum number of seats, which can quite often lead to challenging geometry for sound coverage. The rear section of the stalls may often have the balcony overhanging it, obstructing them from seeing or hearing a central cluster for example.

The Precedence Effect allows us to add speakers off the balcony overhang, which are delayed behind the muffled sound that is coming from the centre cluster, so we interpret the sound as coming from the proscenium when it is in fact

coming from the speaker just in front of us. The precedence effect can allow us to raise the overall SPL in these less than ideal situations, and rebalance the frequency spectrum our audience hears without detracting from where they perceive the sound to be coming from. This can be key to keeping the reinforcement as transparent as possible, and is a commonly used sound design technique to force the listener to believe the sound is coming from the performers on-stage, something which often sounds more natural and pleasing to the audience.

To give an example of how this technique may be used, Figure 5 shows a main auditorium PA and an secondary speaker. The distance between the main PA and the last audience member is shown as A and the distance between the secondary speaker and the same audience member is B.

By measuring the distance of A and B and applying the appropriate delay to B (you can add 1ms of delay for approximate one foot of distance) to make both wavefronts reach the listener at the same time. To apply the Precedence Effect the sound designer may choose to add additional delay to the speaker B according to their taste or, rather, hearing.

Delay between sound sources arriving at each of our ears (inter-aural difference) is just one of the ways in which we localise sounds, however, it is the one which we are easiest able to effect when using multi-speaker audio systems.

Summary

An understanding of the concepts at play when dealing with adding additional loudspeakers into a system can help remedy the issues they can cause.

We hope you get the opportunity to experiment to form your own opinion on what sounds best.



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FIGURE | 53



ARTICLE 50

THE LISBON TREATY



Brexit: now what?



ZOE MILTON

There are no solid facts available about what the future holds for a post EU Britain and it's theatre industry. Much of what we know amounts to informed guess work on the part of the media. Whilst there has been much speculation on a more national scale we thought it would be interesting to look at it from our industries perspective.

The questions for touring theatre and working abroad are apparent. Will we need visas to work in Ireland, France, Germany and other EU states? Will we need to prepare carnets to move equipment around? Will we have to pay more

tax if double taxation agreements aren't negotiated? How much would this make touring abroad logistically and financially more difficult? Will joint ventures between UK and EU companies be jeopardised? A lot of UK touring companies rely on international touring income to subsidise their work in the UK.

The potential consequences for domestic theatre are less immediately apparent. UK theatres have benefited from European funded regeneration funds, or the urban areas they are located in have. Some UK productions have received EU money via funds like Creative

Europe. Many of course do not, but much of the infrastructure of venues and the organisations between them do receive EU funding, either directly or indirectly. What state will our venues, our arts organisations be in post-Brexit? In this time of austerity it is hard to imagine EU funds to the arts being equally matched.

What will happen to EU-born professionals working in the UK? Will they be deported if they don't earn above the current £35k income threshold required for residency in the UK from non-EEA migrants? Vice versa will UK professionals working abroad be deported back to the UK?

The reach of EU legislation within our industry is vast. We are subject to several different pieces, from the Working Time Directive, to the Construction (Design Management) 2015 regulations. These regulations are already in place, but will they be replaced with equivalent legislation? Many of you may remember that tech rehearsals used to start at 9am and finish at 11pm before the working time directive ushered in a new approach to scheduling, and scheduling in anything life-related was nigh on impossible.

And what of the regulations that are being discussed at the moment, such as the PSME

spectrum allocations? The current proposal is to clear 694-790 MHz for mobile broadband by June 2020. If we're not part of the EU when these negotiations are finalised, will we be able to make a case for our industry as effectively as we would hope?

What will the industry look like once we've finished the withdrawal process? How will the existing EU directives be incorporated into UK legislation? Who will form these new laws and what will influence them? Will we be able to take this opportunity to redesign better suited regulations for our industry, without the inevitable compromises that Europe wide legislation could contain?

We are already experiencing some of the effects of Brexit, with the pound having lost its value against the US dollar and other currencies considerably. It is early days and many are looking to see if it will recover its worth. If it remains at current levels we can expect to see the cost of hardware and software rise significantly as manufacturers adjust their UK prices to match the exchange rates, so our show budgets won't go so far. The flip side of this is that the UK is a more attractive place to tourists as their money is worth more, and hopefully they'll spend that at the theatre. For those of us who work and are paid abroad, our pay is now

worth more than it was when converted to GBP.

It is easy to be pessimistic about Brexit but this period of change could also be an opportunity to improve the conditions that we presently operate within. We all have different opinions on the outcome of the referendum; our differences are what make theatre such a vibrant and exciting thing to be part of. Telling our stories and getting passionate as we do so are traits that define sound engineers and theatre folk in general.

There is an opportunity to make our industry stand out, fight for what we want to keep and shout about the things that don't work. We know the EU isn't perfect, whilst some legislation clearly protects, some legislation can be cumbersome and time consuming to adhere to, so now is the time to make ourselves heard and hopefully improve our conditions.

What happens next?

Signing Article 50 is the first step toward the negotiations agreeing removal of the UK from the Union. Until this treaty is signed, we are still fully paid up members of the EU with all the rights and responsibilities that membership entails.

Article 50 is the clause of the Lisbon treaty that

sets out the legal process for a country wishing to leave the EU, which when invoked will give the UK two years to negotiate an exit plan. Two years sounds like a fairly long time, but in political terms it really isn't, given the number of EU states there are to negotiate with on a vast array of topics. This may go some way to explaining why Theresa May is so keen to take her time and talk with as many other heads of state as she can before invoking Article 50.

Article 50 states that the treaty must be signed in accordance with constitutional law. There is a question being raised whether the PM can sign Article 50 without an act of Parliament, as this might violate our constitution. If Parliament debate the creation of a new act to make Article 50 law, it opens up the possibility that MPs could decide not to agree the new act and so make signing Article 50 impossible. This case will be heard by October 15th. There is still the option for the Prime Minister to use Royal Prerogative, a set of fairly ancient laws which give her the right to act autonomously.

But assuming that Article 50 is signed, the domestic wrangling around Brexit will further complicate and hinder negotiations to leave the EU, making that two year time frame seem even shorter. If the negotiations fail and we're unable to negotiate an extension (which would require

approval from every single EU member state) the UK reverts to a World Trade Organisation (WTO) country and will be bound by the terms and trade tariffs of those agreements. These are tariffs for trade and movement of goods and services; typically higher than the membership fees of the EU that the UK currently pays, and without the benefits we receive from the EU. However a framework already exists for countries outside of the EU to trade and operate with EU members. Norway, Lichtenstein and Iceland are members of the EEA (European Economic Area) and are not part of the EU but are allowed access to the single market and there is the possibility that we could remain part of the EEA whilst opting out of the EU.

Where we will end up is difficult to predict. What has been evident from recent months is that there will be a lot of political turmoil getting there. Politically there may not appear on the surface to be much actual movement towards Brexit happening, but people are making plans, opinions are being formed, policies are being drafted. However you voted, however angry or excited the referendum made you, it is important that we make our voices heard, our industry heard, so that our art form, our careers, our community are not negatively impacted by the decisions and policies made as we move toward exiting the EU. If Brexit means

Brexit then now is not the time for us to be divided about our opinions towards it, now is the time for us to be unified in using this as an opportunity to improve the conditions of our work life as well as our home life.

What you can do

It is important to share your opinion. Get in touch with your MP. Letting them know your thoughts (politely!) as a constituent is a good way to make your voice a little louder. Let them know how the potential answers to the questions outlined in this article would affect your working life. What would another reduction in arts funding do to your local arts scene do to you, to your community? What EU legislation would you like to keep in place?

Keep informed; sign up to your MP's mailing list.

Check out 38 Degrees, they make getting involved very simple.

<https://home.38degrees.org.uk>

Monitor what is happening in your industry. Have a look at the PSME discussions; one of the most informed people on the subject is Tuomo George-Tolonen from Shure. Check out their booklet 'Loosing your Voice', or sign up for a wireless master class.

<http://tinyurl.com/jscr52e>

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Mini profiles



NIGEL HOGG

What is your current project and role?

I'm currently working as MD/Sound Designer on The Cromer Pier Show, the last remaining full season end-of-the-pier variety show in the world. (Yes really!!)

What is the favourite part of your work/process?

I find exploring new technical challenges the most interesting part of my work. I'm always trying to push the boundaries of what can be achieved with a certain piece of equipment or software – sometimes to the limit – often quite dangerous in a show situation!

What would you change about your work / the industry?

In my branch of the industry, variety, I would prefer the MD and particularly the Sound Designer to be more involved in the creative process rather than being presented with a fait accompli creatively and then having to jump through seemingly impossible musical hoops to achieve it. Also for a director to understand that sound is equally as important as lighting!

What's your top trick / tip?

Always have a back up – or several! (see above)

What are you listening to at the moment?

I'm currently mixing/mastering an album for one of our singers, so that's occupying all my listening time at the moment.



URSZULA ZYGUŁA

What is your current project?

I'm investigating the idea of making a sequel – based on 'google poetry' – of my short opera *Top 4* (for three singers, piano and live electronics) presented during last year's RCS PLUG festival; building my own sound effects library and working on the experimental *Send a Soundcard* project with which I won some time ago the IT Fresh Ideas Competition.

What is the favourite part of your work?

While starting to create new sounds – the same feeling of pure joy and excitement I had as a child while entering a playground; and the possibility to collaborate with talented and inspiring people.

What would you change about the industry?

I don't work exactly as a sound designer for theatre at the moment, so I'm not in the position to answer this question directly, but as a Scottish-based musician I would feel better if the London's domination over the rest of UK in the arts industry wouldn't be so crushing.

What's your top trick / tip?

Effective time management – and by that I, paradoxically, mean giving myself just slightly less amount of time I would desire to complete a task; that breaks me out of my comfort zone, boosts my productivity and then the best things happen.

What are you listening to at the moment?

Per Nørgård's *7th Symphony* and Steven Cerio's soundtrack from *The Magnificent Pigtail Shadow*.



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