

## **A hearing aid you install yourself**



### **Invented in Melbourne with bionic ear technology**

**Embargo and launch 10.30 am, Wednesday 27 April 2011,  
at the Bionic Ear Institute, 384-388 Albert St, East Melbourne VIC 3002.**

**Users available for interview, demonstrations, graphics, photos available.**

Melbourne researchers have invented a small, smart, self-managed hearing aid that outperforms most conventional hearing aids for less than half the price.

It uses technology first developed for Australia's bionic ear, and is so simple to set up that most users can buy one over the internet and fit it themselves. That brings the cost down to between \$1,000 and \$1500, or less than \$3000 for a pair.

The user can then easily fine-tune it and even switch the settings to suit the home, work, or the pub.

The new technology was launched in Melbourne today by the inventor of one of its core technologies, Dr Peter Blamey, founder of Australia Hears and Deputy Director of the Bionic Ear Institute.

"Australia's bionic ear has already brought hearing to hundreds of thousands of deaf children and adults worldwide. Now, our hearing aid uses technology from the bionic ear to bring better hearing to the millions of Australians with hearing loss who have been put off by the cost, complexity and stigma of conventional hearing aids," he said.

The new hearing aids are the culmination of nearly twelve years of research and development supported at key stages by the Australian government.

"In 1998 we created digital technology for the bionic ear that allows the user to boost or reduce key frequencies so that all the important sound frequencies for hearing are at a comfortable level," says Peter.

"We realised that this technology (known as ADRO) could help not only people who are deaf, but anyone with hearing loss and we created a company, Dynamic Hearing, to commercialise it. It turned out there were applications in headsets and mobile phones as well as hearing aids. To date, most of the hearing aids using ADRO have only been available overseas," says Peter.

"But we wanted this technology to make a difference for Australian's with hearing loss," says Australian Hears co-founder and audiologist Elaine Saunders.

"So we created a new business, and a new business model for hearing aids, to make the technology available to the millions of Australians who suffer hearing loss," she says.

"This is the hearing aid for the iTunes generation. It's small, smart and it works."

"We have a generation of middle-aged Australians whose quality of life has already been affected by hearing loss due to loud music or occupational noise," she says. "You may not think you need a hearing aid, but ask your partner or friends."

The hearing aid is easy to purchase online – it comes out of the box already adjusted, based on a hearing test or by six simple questions answered online. Then, if you want, you can play with your hearing aid – fine-tuning it and even creating settings for the pub, the family visit or work.

Independent Brisbane audiologist Steve Grayson-Riley has trialled and added the Australia Hears hearing aids to his range. When he first tried one he was surprised how easy it was to use and tune.

"They are just as good as hearing aids costing much more," he says. "And they give control back to the wearer. For many people that's important, and it was what I was looking for when I first studied audiology."

Now, with the help of a Victorian government grant, Peter and his colleagues are designing the next version which will be prototyped using an advanced manufacturing facility at RMIT and may then be made in Melbourne.

Background information and photos at [www.australiahears.com.au](http://www.australiahears.com.au)

For interviews contact: Niall Byrne, 0417 131 977, [niall@scienceinpublic.com.au](mailto:niall@scienceinpublic.com.au)  
or AJ Epstein, 0433 339 141.

ADRO is a registered trademark of Dynamic Hearing. It is an abbreviation of Adaptive Dynamical Range Optimisation.

Bluetooth is a registered trademark of Ericsson on behalf of the Bluetooth SIG.

Australia Hears is a registered trademark of Australia Hears.

# Media kit: Australia Hears 27 April 2011

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## Making hearing aids in Melbourne



**Embargo and launch 10.30 am, Wednesday 27 April 2011,  
at the Bionic Ear Institute, 384-388 Albert St, East Melbourne VIC 3002.**

The next generation of hearing aids could be made in Melbourne thanks to a Victorian government grant that will fast-track the prototyping of Australian-designed hearing aids.

The \$50,000 small technology grant will fund Australia Hears to use RMIT's rapid prototyping facilities to test new hearing aid designs.

Australia Hears has already created a unique hearing aid that uses bionic ear sound processing technologies, that can be bought online and customised by the user, and that is less than half the price of competing hearing aids.

The Australian design is currently manufactured in Thailand using American-designed hardware.

"This grant will allow us to trial 'bespoke' manufacturing techniques," says Peter Blamey, the co-founder of Australia Hears.

"RMIT's advanced manufacturing precinct has a range of 3D printers using lasers and other technologies that allow us to make parts like hearing aid shells directly from the computerised design.

"The grant will definitely help us bring our next generation of hearing aids to market faster. It will halve the design time and slash the design cost by 80 per cent. Equally importantly, if it works well, we will then be able to use the same technologies to make the final product here in Melbourne."

The grant is a \$50,000 Small Technologies Industry Uptake Program Technical Voucher – provided by the Victorian Department of Business and Innovation.

### Background information

Australia Hears designs and sells a small, smart, self-managed hearing aid that outperforms most conventional devices for less than half the price.

It uses technology first developed for Australia's bionic ear, and is so simple to set up that most users can buy one over the internet and install it themselves for between \$1,000 and \$1500 (less than \$3000 for a pair).

The user can then easily tune it and switch the settings to suit the home, work, or the pub.

The new manufacturing technologies now available in Melbourne will allow them to create new models faster.

RMIT University's Advanced Manufacturing Precinct (AMP) facility brings together research, design and advanced manufacturing in one location, providing new opportunities for innovation and product development/prototyping.

Digital manufacturing technologies housed at the AMP include high-speed multi-axis machining centres that use subtractive processes and additive manufacturing technologies, and include Selective Laser Melting (SLM) and Fused Deposition Modelling (FDM).

The equipment can build final products direct from a computer model in diverse materials, ranging from timber and polymers, to resins and composites or metals and high tech alloys. Highly accurate digital coordinate measuring machines (CMM) will allow detailed verification for quality assurance and reverse engineering.

As a result, some traditional manufacturing processes such as cutting, milling, grinding, tool-making, die-casting and plating can be bypassed. This offers dramatic savings in time, materials, energy and other costs, and significant reductions in adverse environmental impact.

Note: Australia Hears co-founder Elaine Saunders is also the industry contact for RMIT's AMP.

Background information and photos at [www.australiahears.com.au](http://www.australiahears.com.au)

<http://www.rmit.edu.au/advancedmanufacturing>

For interviews contact: Niall Byrne, 0417 131 977, [niall@scienceinpublic.com.au](mailto:niall@scienceinpublic.com.au) or AJ Epstein, 0433 339 141.

## Independent audiologist Steve Grayson-Riley discusses the Australia Hears hearing aids

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Steve is an audiologist and hearing aid wearer – who uses and sells Australia Hears devices but not exclusively.

### **Why don't people use hearing aids?**

Steve says it's a combination of stigma, cost and a perception built up over the years that they don't work very well.

Steve understands that perception. He got his first hearing aid at the age of five. "It was a hideous two inch long banana. I was always getting in trouble for not wearing it."

At 26 years of age he lost his hearing aid playing Australia Rules Football. When he went to get a replacement he ended up not just with a new hearing aid, but also with a new job with the Australian Government hearing services provider Australian Hearing. That led, in due course to Steve completing a Masters in audiology at the University of Queensland when he decided to train as an audiologist to learn more about his own hearing and how to improve it.

Steve graduated from University six years ago and now operates as an independent audiologist in the Brisbane suburb of Holland Park.

He has trialled and now sells the Australia Hears hearing aids. When he first tried one he was surprised how easy it was to use and tune. "They are just as good as some hearing aids costing much more," he says. "And they give control back to the wearer. For many people that's important, and it was what I was looking for when I studied audiology.

He wears one himself – but not exclusively, he routinely swaps aids.

Steve says, "For me, the benefits of the Australia Hears hearing aids are:

Good sound quality – particularly good for musicians

A great alternative for time-poor or remote users who can't easily visit an audiologist

Empowering – the hearing aid and its software allows the users to take control of their own hearing.

Low cost – the Australia Hears devices deliver the same quality of sound of many more expensive hearing aids.

It's designed and developed in Australia."

He says they're not for everyone – there's always going to be people who will want and need to see an audiologist and have everything done for them.

But only one out of every five people who could benefit from hearing aids actually has one. Price and stigma tend to keep people away.

"For the user, the Australia Hears technology and business model dramatically reduce the investment in time and money needed to get a high quality hearing aid. It also offers a challenge, and an opportunity for audiologists to bring their skills to bear to reach the millions of Australians whose quality of life would be improved overnight if they used a hearing aid.

You can read about Steve's hearing journey at his website at

<http://www.graysonrileyaudiology.com.au/site/misc/steves-story>.

Steve is available for interview on 0403 550297 or email [steve@graysonrileyaudiology.com.au](mailto:steve@graysonrileyaudiology.com.au).

## Rediscover a world of sound

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Australian researchers have invented a small, smart, self-managed hearing aid that outperforms most conventional devices for less than half the price.

It uses technology first developed for Australia's bionic ear, and is so simple to set up that most users can buy one over the internet and install it themselves for between \$1,000 and \$1500 (less than \$3000 for a pair).

The user can then easily tune it and switch the settings to suit the home, work, or the pub. So, is it time for you to get a hearing aid?

### Most Australians will need a hearing aid one day

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According to the Australian Government one in six Australians suffers from hearing loss – that's 3.6 million of us.

For many people – especially men – hearing loss strikes earlier due to the impact of workplace noise. Half of Australia's farmers for example, suffer from premature hearing loss.<sup>1</sup>

The cost to the community is almost \$12 billion a year, with nearly 160,000 people not working because they can't hear well enough, according to Access Economics<sup>2</sup>.

And most of us will be affected if we live long enough – seven out of 10 people over the age of 70 suffer hearing loss.

### Will a hearing aid improve my life?

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Do you often ask others to speak up? Do you struggle to stay in a conversation at the pub or a café? Do you family complain that the TV is too loud?

Ask your partner if they think a hearing aid will improve your own and their quality of life. And if the answer is yes, then try an Australia Hears device – it comes with a 14-day money-back guarantee.

### Three steps to better hearing, without leaving home

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1. Fill in the Australia Hears online questionnaire (there's just six questions) or send a copy of your last hearing test results to Australia Hears.
2. Choose your hearing aid and accessories, and buy them online.
3. Fit your new hearing aid and rediscover a world of sound.

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<sup>1</sup> <http://www.hearing.com.au/upload/media-room/Hearing-loss-in-Australia.pdf>

<sup>2</sup>

<http://www.accesseconomics.com.au/publicationsreports/getreport.php?report=71&id=81>

### Four steps to near perfect sound

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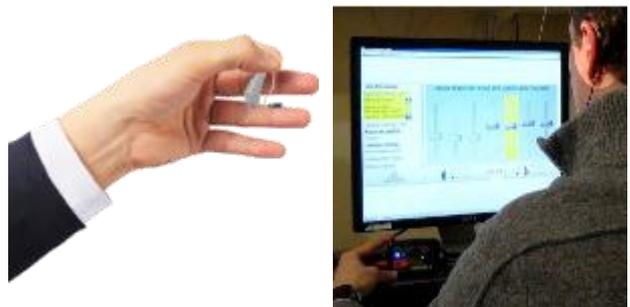
1. Install the Australia Hears software onto your computer and plug in your new hearing aid.
2. Customise your hearing aid using the interactive software with the settings you want for home, the office, or out in the country.
3. Save your choices.
4. You will be able to switch between settings just by waving a small magnetic wand over the hearing aid.

### Australian innovation delivered online

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The new hearing aids contain advanced sound-processing software, called ADRO<sup>®3</sup> for Adaptive Dynamical Range Optimisation. It was invented in Australia by a research team led by Dr Peter Blamey while working on the development of the bionic ear. The ADRO software, designed and manufactured by Dynamic Hearing Pty Ltd in Melbourne, is now used in the bionic ear and many of the high-end Bluetooth headsets sold worldwide.

Hearing aid manufacturers were slow to embrace the new technology, so Peter founded Australia Hears to bring the technology to hearing aids.



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<sup>3</sup> ADRO is a registered trademark of Dynamic Hearing Pty Ltd

“We wanted to build the world’s best software for hearing aids and deliver it direct to the public,” says Dr Elaine Saunders, a qualified audiologist and chairman of Australia Hears. “This means we can keep overheads low and cut the costs of state-of-the-art hearing aids.”

### How does it work?

The ADRO processor analyses the whole spectrum of sound in 32 narrow bands and, using computer fuzzy logic, adjusts each one to keep sound frequencies within the chosen range of comfort—neither too soft nor too loud. This differs from conventional hearing aids which compress a wide range of input sounds into a narrower range of hearing.

### Easy listening

The Australia Hears hearing aids also bring four other technologies into play.

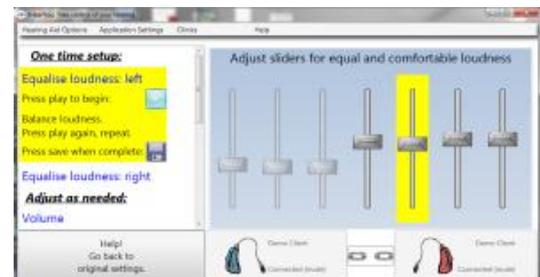
Australia Hears uses a patented technology that provides the shortest delay in the amplified sound of any device in the industry. ‘Multichannel-noise suppression technology’ improves sound quality without affecting must-hear sounds such as speech. The hearing aids also silence the whistling sounds associated with feedback and include an adaptive directional microphone that automatically amplifies the sounds towards which the head is turned.

### For more information

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### Five innovations:

- **32 frequency channels for finer sound processing with less distortion;**
- **An adaptive directional microphone to improve hearing speech in noisy places;**
- **Advanced feedback cancellation to avoid whistling; and**
- **Ultra-low delay sound processing to avoid echoes.**
- **Multi-channel noise suppression.**



### The science and technology behind Australia Hears

**Testing your hearing, ordering state-of-the art hearing aids, and fine tuning them to suit your own hearing needs can now all be done over the internet. It's a simple, inexpensive process that can be completed in the privacy of your own home, and with or without the assistance of an audiologist.**

The new hearing aids, available from Australia Hears Pty Ltd, contain advanced sound-processing technology from Dynamic Hearing called Adaptive Dynamic Range Optimisation (ADRO®), that was developed for cochlear implants. Similar technology is now incorporated in three out of the five highest quality Bluetooth headsets available in 2010.

The ADRO hearing aids match the best available digital hearing aids in the market, but come at less than half the cost.

### A new approach to amplification

Professor Peter Blamey, the founder and managing director of Australia Hears, has spent the past 30 years researching ways to improve the sound quality of cochlear implants and hearing aids. Blamey is also deputy director of The Bionic Ear Institute.

He has long been aware of the limitations of conventional digital hearing aids designed to compress a wide range of input sounds into a narrower output range. In 1998, he hit upon the idea of using a processing chip within the aids to select the most informative parts of a sound range and present them at comfortable levels at each frequency for the listener. The ADRO technology he invented splits sound into 32 different frequency channels, then uses statistical rules as part of the digital amplification strategy to optimize the audibility, comfort and intelligibility of sounds without compromising sound quality (Box 1).

The rules are set for each individual user, and keep the audibility and comfort levels the same as those of a person with normal hearing. "If the sounds falls below the audibility target, it is made louder," Blamey explains. "If it rises above the comfort target, it is made softer."

Each individual can set his or her own comfort levels for different environments with an easy-to-use software program. This eliminates the need to fit hearing aids on the basis of the averages of a sample population as done in conventional hearing aids — a boon for individuals whose hearing preferences are not typical.

Even the software used to customise the hearing aids is evidence-based, using data collected from 176 ears to predict and suggest amplification levels to the individual.

"Conventional compression technology can match ADRO technology in terms of audibility or comfort but not both simultaneously unless very high compression ratios are used.

However, application of these high compression ratios can reduce speech intelligibility in background noise and adversely affect sound quality in quiet surroundings," Blamey notes.

### Fuzzy logic makes sense

ADRO hearing aids work on four 'fuzzy logic' statistical rules, which can be true for part of the time rather than always being true or false. Each rule is applied independently to each of the 32 frequency channels in an individual's hearing aids.

Each rule has a critical role.

The comfort rule ensures that sustained sounds are not too loud more than 10% of the time.

The audibility rule ensures that sustained sounds are not too soft for more than 30% of the time.

The hearing protection rule stops sudden loud sounds from being amplified beyond a maximum level for the listener.

The background noise rule prevents low-level background noise from being over-amplified and annoying to the user.

### ADRO amplification has been shown to:

- make soft sounds more audible  
At the same time as
- making loud sounds more comfortable  
At the same time as
- improving intelligibility for speech in background noise  
At the same time as
- providing preferred sound quality.

### Applying four technologies

Hearing aids from Australia Hears include four technologies that enable easier and more flexible customisation.

1. The ADRO processor optimizes sound for a listener across 32 different frequency channels.

2. An automatic adaptive directional microphone reduces the loudness of background noise from some directions. Research shows that these microphones provide better speech perception than either omnidirectional or fixed directional microphones.
3. Incorporation of adaptive feedback cancellation that prevents the high-pitched whistles of feedback loops that occur when the microphone of an amplifier is too close to its speaker.
4. A patented ultra-low delay processing technology to eliminate perceptible distortions or echoes caused by sound delays as sound is processed from analogue to digital signals. The Australia Hears technology has the shortest delay of any device in the industry.

### Clinical trials

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The ADRO amplifier has been evaluated against an alternative amplifier in several clinical trials<sup>1-6</sup>. Results from these trials, which were conducted by the Cooperative Research Centre (CRC) for Cochlear Implant and Hearing Aid Innovation in Melbourne, showed that 42 experienced hearing aid users preferred hearing aids with ADRO sound processors over conventional compression processors in most situations. These preferences were associated with improved sound quality, improved speech perception in quiet and in noise, and improved loudness control.

“This is one of the few hearing-aid sound systems to have completed rigorous clinical trials successfully,” Blamey says. “The trials showed that 3 out of 4 users preferred the hearing aids with the ADRO processor rather than the compression processor that is used in most other hearing aids.”

In the studies, both the ADRO and non-ADRO processors were tested in the same type of hearing aid hardware in a diverse range of subject groups. The researchers also varied the comparative experimental conditions.

### Additional uses

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ADRO also has the flexibility required to improve hearing for any level of hearing loss, whether it's a person with normal hearing using headsets and telephones, a person with mild hearing loss who needs hearing aids, or a person with severe-to-profound hearing loss and requires a cochlear implant.

“ADRO is being applied in headsets and other devices for listeners with normal hearing to provide improved audibility and intelligibility to compensate for poor telephone transmission lines, and to protect hearing from loud sounds and acoustic trauma,” Blamey explains.

In 2007, Blamey was honoured by the American Academy of Audiology with the International Award for his work in hearing and language research.

### Product heritage

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The products of Australia Hears are based on research conducted at the Bionic Ear Institute, funded by the CRC for Cochlear Implant and Hearing Aid Innovation.

The ADRO technology is used in cochlear implant sound processors made by Cochlear Limited of Sydney.

The digital signal processing algorithms used in Australia Hears products were developed at Dynamic Hearing in Melbourne and the House Ear Institute in Los Angeles, and are licensed from Dynamic Hearing Pty Ltd.

The hearing instruments are manufactured in Thailand by America Hears using high-quality components including digital signal processing (DSP) chips from Sound Design Technologies in Burlington, Canada, and microphones and speakers from Knowles of Itasca, Illinois.

### Further reading on clinical trials

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Blamey, P.J., Martin, L.F.A. & Saunders, E. Hearing aid benefit as a function of hearing loss. *Thirteenth Australasian International Conference on Speech Science and Technology* Melbourne, Australia, December 14 - 16, 2010.

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James, C.J., Blamey, P.J., Martin, L., et al. Adaptive dynamic range optimization for cochlear implants: A preliminary study. *Ear & Hearing* **21**, 49S–58S (2002).

Martin, L.F.A., Blamey, P.J., James, C.J., et al. Adaptive dynamic range optimization for hearing aids. *Acoustics Australia* **21**, 21–24 (2001a).

### Bringing Australian hearing science to the community and the market

**By putting himself in the place of the user, an Australian scientist and inventor—now entrepreneur—has created a new approach to hearing loss. He has combined smart software and hardware with knowledge of the web to deliver improved hearing without the high price and stigma of current hearing solutions. In short, he has removed the barriers to obtaining hearing aids.**

Peter Blamey, who has dedicated his 30-year career to assisting the hearing-impaired (Box 1), had a Eureka moment in 1998 at a conference called *Issues in Advanced Hearing Aid Research* at Lake Arrowhead, California. His moment led to the development of new technology for digital hearing aids that are now available online for almost one-third of the cost of their market equivalent. The aids can be fitted in the comfort of your own home—with or without the assistance of an audiologist.

The technology, called Adaptive Dynamical Range Optimisation (ADRO®), is also used now in all Australian cochlear implants and in leading brands of Bluetooth headsets.

At the time of the conference, Peter had been working on the Combionic Program of the CRC for Cochlear Implant and Hearing Aid Innovation at Melbourne University. Combionic refers to the use of two devices—a cochlear implant in one ear and a hearing aid in the other—to assist the profoundly deaf. Since the two devices don't always allow the listener to hear sounds in the same way in each ear, Peter and his team had been grappling with how to overcome difficulties with "gain"—that is, making sounds in the hearing-aid ear loud enough so that it didn't sound like everything was coming from the cochlear implant.

At the Lake Arrowhead conference, Peter says he was struck by how complex the hearing aid specialists were making the need to adjust gain using a method called compression—squashing a wide range of input sounds into a narrower output range.

"From the point of view of the listener with a hearing impairment—all that is important is ensuring that sounds stay within a comfortable range, with the soft sounds not too soft, and loud sounds not too loud," he explains. "It is as simple as that."

### Improving hearing devices

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Upon his return to Australia, Peter enlisted the help of Brett Swanson, a digital signal processing engineer at Cochlear Ltd in Sydney. The pair wrote some digital signal processing

### Peter Blamey

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*Peter Blamey's 30-year career began as a physicist at Monash University. From 1979 to 2002 he was a key member of the research team for the University of Melbourne and its associated CRC for Cochlear Implant and Hearing Aid Innovation, where he helped develop the first multichannel cochlear implant, the Bionic Ear. Peter is now deputy director of the Bionic Ear Institute and the founder and managing director of Australia Hears Pty Ltd.*

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(DSP) rules for the ADRO processor to make sure that sounds from the hearing aid wouldn't be too soft or too loud.

"For the cochlear implant, we didn't mess around with a lot of experimental devices," Peter says. "Within two weeks we had ADRO implemented in wearable implants." He trialed those implants in about a dozen patients in Melbourne, and the University filed a patent for the technology in 1999. The technology is now included in all of Cochlear's sound processors.

Peter then set his sights on improving hearing aids with ADRO. The first aids with the ADRO technology were produced in about 2002. While Peter and his colleagues worked on refinements for the ADRO hearing aids, they began negotiating the complex world of commercialization.

### The path to commercialization

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After development within the CRC, the first funding for ADRO hearing aids was obtained in November 2000—a \$40,000 prize from the Melbourne University Entrepreneurs Challenge for which Peter and his colleagues wrote a business plan despite having little business experience.

This eventually led to \$2 million in Innovation Investment Fund (IIF) Venture Capital funding from Rothschild Biosciences (now GBS

Ventures) and Nanyang Ventures (now Four Hats Capital). In 2002, Peter co-founded the company Dynamic Hearing as a spin off from the CRC for Cochlear Implant and Hearing Aid Innovation. The other co-founder was Elaine Saunders who was a research and commercialization manager at the CRC.

After Dynamic Hearing and the CRC completed successful clinical trials in October 2002, Dynamic Hearing signed its first licensing deal with Intrason, a French hearing aid manufacturer. In June 2003, Dynamic Hearing received a further \$3 million of IIF Venture Capital funding from GBS Ventures and Nanyang Ventures.

In mid-2003, Dynamic Hearing received a \$750,000 start grant from AusIndustry, and in 2004 it received a further \$250,000 from AusIndustry's Biosciences Innovation Fund (BIF). These funds were used to develop new technologies, such as the adaptive directional microphone to improve hearing speech in noisy places and ultra-low delay in sound processing. In August 2005, Dynamic Hearing received a Commercial Ready grant of \$1.28 million from AusIndustry.

Dynamic Hearing is now a leading provider of high quality digital sound processing technology for ultra-low power communication devices, including Bluetooth headsets. Despite success with smaller early adopters, Dynamic Hearing struggled to get the interest of major hearing aid manufacturers.

Gaining acceptance which put the technology into relatively new devices such as headsets and cochlear implants was more straightforward than in hearing aids, Peter notes, because they didn't need to overcome any preconceived ideas.

To pursue their original goal of providing cheaper and better hearing aids to those in need, Peter and Elaine established Australia Hears in 2006. After trialling and refining the technology and the online delivery system to a steadily expanding community of hearing-aid users, Australia Hears is now ready to bring the benefits of the ADRO hearing aids to the broader community.

### For more information

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### Awards won by Australia Hears founders: Peter Blamey, Elaine Saunders and associated organizations

- *Melbourne Business School Entrepreneurs' Challenge 2000, won by CRC research team*
- *CRC Commercialisation award 2002, shared by Cochlear and Dynamic Hearing*
- *Emerging Exporter of the Year Award, 2003/4, won by Dynamic Hearing*
- *Telstra Business Woman of the Year Award, Government and Corporate sector, 2004 won by Elaine Saunders*
- *Manpower Employee of the Year Award, 2005, won by Peter Blamey*
- *International Award from the American Academy of Audiology, 2007, won by Peter Blamey*
- *Samuel Lybarger Award for Services to Audiology from Industry from the American Academy of Audiology, 2010, won by Elaine Saunders*
- *Leading Woman in Healthcare in Asia, 2011, won by Elaine Saunders.*

## Returning to the whole world of sound

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### Tim Thwaites talks about his introduction to Australia Hears.

*Tim is a science writer and broadcaster with Science in Public, who are helping to publicise the Australia Hears achievement. He is also one of the millions of Australians who have put off buying a hearing aid because of the cost and stigma. He trialled and now uses an Australia Hears hearing aid that he purchased at his own expense online.*

**After years of muffled hearing, the world's a noisy place for someone being reintroduced to crisp sound. Suddenly audible are the sounds of the explosive snap of the metal tongue of a closing door, the repetitive sound of a traffic indicator, the trickle of running water and the rustle of clothing.**

The first days—seconds even—of hearing aid use are a real ear opener. On the one hand, you are spellbound at sensing all the wonderful intricacy of the sound you were missing; on the other, it is a jarring return to a nerve-jangling world of noise.

Control is the compromise between the magic of sound and irritation of noise—having the capacity to match the volume of sound to the sensitivity of your ears across a wide spectrum of pitch. Australia Hears is putting this ability into the hands of any hearing aid user with access to a computer.

### My experience with Australia Hears hearing aids

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Australia Hears has matched sophisticated sound processing techniques—developed by the CRC for Cochlear Implant and Hearing Aid Innovation and Dynamic Hearing Pty Ltd—with the latest hearing aid hardware from America Hears, and their own fitting software to produce hearing aids which can be customised to by an individual to their specific hearing needs.

In fact, after submitting your latest hearing test or completing an online questionnaire, you can acquire your hearing aids online and subsequently fine tune them on your home computer. The fine tuning for different environments can be done using a software program called I Hear You™ and a programming box that connects your hearing aid to your computer. The box can be borrowed or purchased for \$275. The user can then switch easily between the programs as they move from different hearing environments such as an office, home or restaurant.

Not only do you gain enormous control over what and how you hear, but Australia Hears provides the latest in hearing aid technology for less than half the cost of its competitors. The idea is to break down the barriers of high price and stigma that prevent people from thinking of hearing aids in the same way as glasses—they are a routine device that simply makes listening easier.

A visit to the Australia Hears website at [www.australiahears.com.au](http://www.australiahears.com.au) will furnish you with information on the company, its staff and

a history and explanation of its technology, along with frequently asked questions and a series of testimonials from users. You will also be able to purchase one of three hearing aid models, plus a range of accessories. The models vary in terms of size and power.

In order to assess whether you really need a hearing aid, the website provides a questionnaire and a couple of options for testing. The best option is a traditional audiogram test conducted by a professional audiologist. This generally costs less than \$100. If you can provide Australia Hears with the results, the company then can pre-program your hearing aid before sending it out to you.

If you decide you need a hearing aid, the price of a single device ranges between \$990 and \$1250, at most \$2500 for both ears. And the purchase can be completed on the secure website using a credit card. The only other question you have to settle, besides which model and colour suits best, is to do with the length of the tube which sits in your ear. This is a simple matter of printing out a measuring template provided on the website, and having someone help you to estimate your ear size. The instructions and illustration are relatively clear.

### Taking delivery and control

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The hearing aids can be delivered to your door in Australia within a day or two, in many cases overnight, depending on where you live. They arrive with everything you need, including intelligible instructions, although, as always, you need to be prepared for the odd misconception, especially if you have never dealt with hearing aids before.

I thought, for instance, that the speaker in ear (SIE) model I ordered would actually be lodged in my ear, as I had seen other hearing aids of that style. In fact, all Australia Hears devices sit behind the ear with transparent tubes containing the speakers leading into the ear canal. The SIE models, however, are small enough to be completely unobtrusive. (My work colleagues and children only noticed my hearing aids after they had been told I was wearing them.)

After getting that straight, I found that fitting the devices is simple and intuitive. The pictures provided helped. Essentially, what you are doing is putting a tiny, speaker/microphone into your ear canal, close to your ear drum, and the electronic hardware which manages it is lodged behind your ear.

Apparently, when the batteries are properly installed in the device, there is a reassuring beep but, if your hearing is deficient, without your hearing aids in, you are unlikely to hear it. Similarly, when the batteries lose power, after about 100 hours of use, they warn you with a set of beeps. But always remember to open the battery door to switch the device off before you store your devices for the night.

Once the batteries are loaded and your hearing aids are in, be prepared to make some adjustments. The first sounds lost when your hearing begins to go are sibilant and percussive, the friction of the world. Restoring them produces a cacophony of rustling, scratching, whirring, humming, and explosive clicks. Until you are able to hit the volume control, or the auditory part of your brain adjusts, your voice itself sounds hard and tinny—and it can feed back into speaker itself, giving the impression of speaking in a metal-lined cavity. Much of this harshness disappears when you tune your hearing aids to meet your requirements.

While that introduction may sound a little unnerving, the revelation of what you have been missing more than compensates. Suddenly you have the ability to hear clearly what people are saying, even when speaking softly and recognise a footstep as not just a muffled thud. You can even hear the rustle of the leaves as the wind blows through them; and the warning noise that there is someone out of your vision about to collide with you.

Sound takes on a subtlety you never really recognise until you have it taken away from you. And although your hearing aids will have been pre-tuned to suit your hearing, there will always be room for refinement.

So, I view the purchase of the I Hear You programming box and software—which is technically an accessory—as essential. It not only sets Australia Hears apart from other hearing aid suppliers, it also ensures you have the ability to adjust your hearing to particular environments. Further, it is an insurance policy against the changes your hearing will go through as you age. You can tailor your hearing aids quickly and easily in the comfort of your own home.

### **My step-by-step installation experience**

Initially, that experience involves installing the software on the enclosed CD on your computer. Then you connect your hearing aids to a small, supplied programmer box which you subsequently attach to your computer via a USB plug—but only after you have installed the software. Most of the ensuing tuning process involves listening to sounds through your hearing aids and adjusting the settings on the computer screen. These adjusted settings are then transferred to the hearing aids via the programmer box.

The I Hear You program is easy to use, and comes with comprehensive instructions. First, you need to adjust the extent by which various pitches are boosted in each ear. This is done using chimes at four different pitches. You can adjust the sound of each pitch via a slider to a level which is comfortable. This information, in turn, is used to tune your hearing aids. Given that your hearing aids have been adjusted for you on the basis of a comprehensive hearing test or questionnaire before they were sent out, the tuning will generally be fairly minor, but the results can be significant.

Second, you need to adjust the overall volume of each device. This is done initially using your own voice, and then the sounds of the surrounding environment. By the time those two adjustments have been made, much of the original jarring and harshness of the sound environment will have disappeared. By this stage, I found that the hearing aids fitted into the surrounding sound environment so well, that I started to find myself wondering if they

were working at all. This concern was soon dispelled by asking the opinion of people close to me, and by removing the hearing aids.

### Further refinement

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Further down the road you will be confronted by having to decide how much you should be able to hear. After all, even when your hearing was at its best, there were lots of sounds you couldn't pick up. So how sharp should your artificially enhanced hearing be?

For the first few days or even months, that may be all the tuning you need to do. But I tried some of the more advanced tuning available. The most easily accessible uses a series of different timbres of sound—birds, klaxons, traffic etc.—to tweak the devices in more complex ways. Most people will find that, having been through the initial tuning, there is little to do. But it's a comforting experience being able to check the range of sounds you can now hear clearly.

After that, most of the adjustment will involve two things: changes in your hearing, or changes in your environment. There are, for instance, different programs for coping with the different environment that, say, musicians encounter.

The only other adjustments I needed to make to incorporate my hearing aids into everyday life were to simply get used to putting them in and taking them out, cleaning them, storing them, and generally maintaining them. To make things comfortable behind my ears, I occasionally fiddle with the hearing aids but they are generally quite compatible with my glasses.

### Daily care

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I take my hearing aids out before I go to bed, and store them overnight in the supplied jar of desiccant beads to protect them against moisture. Generally, I don't undertake sweaty exercise with them in. They can easily be stored in the carry case at this time. When they are out for long periods of time, I try to remember to preserve battery life, by opening the doors to the battery compartment, which switches the hearing aid off. I live in fear of the day that I will forget to take them out before showering or swimming—but one blogger who has done so says he found they survived with quick action and a wipe.

The hearing aid speaker, which is inserted into the ear canal, is normally quite stable if the devices fit properly. Many people, however—and I am one of them—like to pack them in with a little silicon cap that fits over the tip. A selection of these caps is supplied with the hearing aids. Not only can they make the speakers fit snugly, but they can also direct the sound a little more efficiently. Although occasionally the speaker can initially feel like an irritating bug has crawled into your ear, this is relatively rare, and calms down over time.

Clearly, hearing aids are not compatible with the sort of bud earphones of music players that fit into the ear—but with the earmuff type, there is no difficulty. Of course, good earphones can be adjusted to perform in a similar way to a hearing aid. But once your devices are adjusted and tuned, why would you want to go through it all again with a less responsive set of earphones?

After about a week, my wife was elated that I was speaking so much more softly and that the radio volume was still down.

### For more information

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