

Hearing loss and the music lover

Richard Freed has discovered that modern devices can enable many listeners with impaired hearing to enjoy their record collections once more.

Hearing loss, which is becoming more and more widespread these days – or in any event is becoming more widely acknowledged and discussed – is of course a major frustration to musicians and to laymen who regard music as an important part of their lives. This affliction is not limited to the elderly, or to participants in egregiously amplified rock concerts. Younger listeners and “classical” musicians (some eminent conductors among them) are among those affected. The demographics are by now so broad that in a growing number of theatres and other public spaces the individual infra-red hearing devices formerly given out to the “hard of hearing” have been replaced by the induction loop, a system installed for the benefit of hearing-aid users. An industry has arisen, in fact, out of the need to protect orchestral players from damage to their hearing during rehearsals and concerts. But the noises to which all of us are subjected in the course of daily living have had a part in the rising incidence of hearing loss, and so have a number of other causes, heredity and ageing among them. Whatever the cause in this or that individual case, this is something of special concern to members of the musical community. For composers, performers, their audiences, and even music critics (whose hearing has always been suspect to certain other members of this community), this is not a minor issue.

Sensory-neural hearing loss, the type most frequently encountered, affects the upper range most conspicuously, with relatively less harm to the mid-range and least of all to the lowest frequencies. These general characteristics, which may involve various levels of distortion more troubling than the mere dimming of the sound, form the basis of research and development in the hearing-aid industry, which now has its digital “high end” products, keeping pace with the audio world. Designers and manufacturers of hearing aids have demonstrated remarkable determination and resourcefulness, and significant improvements in this area have been coming at a steadily increasing pace from companies in Denmark, Germany, Switzerland, and the United States.

While hearing loss is something that must be dealt with on an individual basis, the general characteristic of the sensory-neural type, as sketched above, are such that most otologists and audiologists are in general agreement that of the several types of hearing aid, the BTE (“behind the ear”) type – with the electronics, including a tiny microphone or two and the speaker, in a compact container tucked behind the ear and sending the sound down an inconspicuous plastic tube into the ear canal—is the most advisable because it does not seal off the ear completely and thus allows the user to benefit from the remaining “low end” in his/her natural hearing. The latest models of this type, in fact, rather than merely using that plastic tube to direct the sound from the unit behind the ear, have a wire in the tube, placing the speaker (or “receiver,” as it is called in this usage) in the tip down in the canal.

Naturally, as greater degrees of sophistication were achieved in the design and production of hearing aids, more attention was directed toward addressing the specific

problems involved in recapturing the sounds of music, with significant input from musicians and the music-related audio industry. Edgar Villchur, remembered for the revolutionary Acoustic Research loudspeakers he introduced some 50 years ago, created the Foundation for Hearing Aid Research after selling his company. Mead Killion, the respected audiologist who runs Etymotic Research Inc., based in a suburb of Chicago, has made music a major focus of his company's activity, which ranges from devices to protect the hearing of orchestral musicians to designs for hearing aids intended specifically for listening to music. Etymotic-designed innards are used in the music-orientated "Timbre" line of hearing aids produced by General Hearing Instruments Inc. in New Orleans, and hearing aids from such European manufacturers as Siemens, ReSound, Oticon and Phonak incorporate "programmes" – i.e., specific settings – for music. The audiologist who has worked with me since my hearing loss was diagnosed holds degrees in music as well as audiology and has provided effective solutions for active musicians. Another hearing aid dispenser has a helpful background in audio.

In general, however, music has proved to be a good deal more of a challenge than speech. With regard to speech, we are concerned basically with intelligibility and voice recognition, while music involves both broader and finer concerns. In conversation, we may simply forget we are wearing effectively fitted hearing aids, but with music many listeners find, even after fastidious adjustment, that there is at least a trace of something mechanical, an absence of some nuance that gives life to the sound of specific instruments. High notes – from the violin's E string or a piccolo or a triangle – prove elusive, and huge boosts at the top all too often produce only noise and imbalance while leaving those elusive sounds utterly unrepresented.

Keep in mind that what one may want to hear, based on what one may have been accustomed to hearing, becomes a highly individual and subjective matter, and a "one size fits all" approach is not likely to be productive. While a great number of hearing-aid users – musicians among them – report excellent results from their respective devices, an acceptable reception of musical sound remains elusive for great numbers of others, and the applications for music and for speech sometimes appear to be at odds with one another, even though some of the newest and most sophisticated hearing aids are designed to take care of both music and speech without separate programmes and without any user-operated controls. Some individuals find that their otherwise helpful hearing aids tend to block out some of the defining sounds they are able to hear without those devices – the ping of a triangle, the growl of the double basses, the burr on the trombones – leaving them with a listening experience that is unsatisfying and frustrating, or at best a matter of compromises to which one becomes resigned, and perhaps looking for alternative ways of listening to music.

In my own case, I began experimenting with headphones even before seeing an otologist, and, like many other music-orientated individuals in the same situation, I found this simple option to be a lifesaver. In the years since first confronting my hearing loss, I have been able to continue enjoying recorded music using certain headphones on or in my otherwise naked ears, while continuing to experiment in seeking more musical results from hearing aids under the guidance of an audiologist who is determined, resourceful and, no less remarkably, endlessly patient.

To be sure, headphones can be a little limiting in respect to one's mobility, but the sound they deliver can more than make up for that. Depending upon the degree and nature of an individual's hearing loss, and on the specific hardware and connections

used, the results may range from adequate to downright spectacular. Most of us have a number of familiar recordings we have played with particular frequency – to show off or test our audio systems as well as simply for pleasure – and these should provide a reliable index to the degree of accuracy the various devices provide.

Headphones, of course, are by no means a novelty. Sound engineers use them in making and editing recordings, they are used in broadcasting, and there has for some time been a significant number of home listeners for whom headphones have provided a fully satisfying alternative to loudspeakers, irrespective of any hearing problem. In some instances, residents of apartments with thin walls began using headphones simply because of restraints on turning up the gain on their speakers, and discovered they actually preferred what the 'phones delivered, or the 'phones isolated them from intrusive noises while allowing others in the household to go about their business without the nuisance of music they may not have felt like hearing.

Like speakers and hearing aids, headphones too have undergone some dramatic and resourceful improvements during the last few decades, and now come in various sizes, shapes and styles. Spurred on by the miniaturisation required by such portable devices as the Walkman and the I-Pod, some models of the “in-the-canal” type (sometimes called “earbuds”) have been brought to such a level of accuracy that they now are used by professional broadcast and recording engineers in alternation with, or simply as replacement for, the conventional “over-the-ear” type (which some professional users call “cans”). The aforementioned Etymotic Research, a company that makes some outstandingly effective headphones of the miniaturised “in-the-canal” type, provides a caveat that these devices are *not* hearing aids and are not to be regarded a substitutes for hearing aids – but, again depending upon the individual listener’s degree of hearing loss and on the specific 'phones selected, this option can do the job for many individuals who want to hear recorded music as they remember it.

When I first became aware of my own hearing loss, I had the great advantage of being able to call on musicians, audio designers and sound engineers who had dealt with this problem and related ones. Before I got round to hearing aids, Mead Killion recommended his Etymotic ER-4S “in-the-canal” earphones. They are not very expensive (US\$330 “list price,” available on the internet for about \$210), and they actually did everything claimed for them: big, wide-open sound, excellent balance, particularly effective in the upper range and in capturing small percussion – the triangle in Beecham’s EMI recording of the *Polovtsian Dances*, the castanets in Argenta’s Decca recording of Moszkowski’s Spanish Dances, the tambourine, glockenspiel etc. in various other “demo” items in a list I had developed over the years.

About two years ago Shure Inc., another near-Chicago firm, which earned recognition for its excellent series of phono pick-ups in the glory years of the stereophonic LP, brought out its “professional” model “in-the-canal” 'phones, the SCL-4, priced a few dollars below the Etymotic ER-4S and producing a rich and “round” low end though rather less stunning in the highs.

Both of these “in-the-canal” units come with adaptors for different sizes of headphone jacks, and with a variety of ear tips. The most all-round satisfying performance, from both the Shure and the Etymotic, comes from the flanged (three-tier) conical tips, which are seated deep in the ear canal and make a secure seal, ensuring maximal bass response.

My initial impression was that the “delivery system” just described (rather like the BTE hearing aids in delivering the sound deep in the canal, but unlike them in sealing off “outside” sound) may have had as much to do as the actual electronic design with the remarkable quality of musical sound. That was surely a convenient conclusion, because this type of ’phone is so much less bulky than the conventional “over-the-ear” type: eyeglasses, wet hair, or even a hat would pose no problem in its use. On the other hand, there are probably just as many individuals who do not find the “over-the-ear” type bulky or uncomfortable, and do not care for the idea of sticking objects into their ears – and it has to be acknowledged that, while some “high-end” models of the “over-the-ear” type are priced in the thousands of dollars, there are some in the same price range as the “in-the-canal” units mentioned here which match or surpass the best that type can deliver.

Sony’s MDR-7506, a conventional “over-the-ear” model, was for years regarded as a benchmark by many respected recording and broadcast engineers, despite its modest price. This unit afforded a great sense of spaciousness and solidity, it was gratifyingly accurate throughout the range, and it was available on the internet for less than US\$100 – a phenomenal money’s-worth.

More recently, the German company Ultrasone came out with a new line in which the PRO 750 (list price US\$409, a bit less on the internet) strikes me as providing the most overall realistic sound I’ve experienced from headphones of any type. Ultrasone makes three specific claims for these ’phones, and the first and last are impressively borne out in the listening. First of all, there is “S-Logic Natural Surround Sound,” which places the speaker in each ’phone in a “decentralised position” instead of the conventional one parallel to the ear drum. This has the advantage of taking the sound from inside one’s head, where most headphones deliver it, to an impression of a more comfortably positioned, altogether more natural setting. Instead of being simply in one’s right ear or left, the sound appears to come from this or that sector of a broader listening area.

Ultrasone’s claim of “reducing magnetic radiation up to 98% in comparison to ordinary headphones” is hardly something one might sense in simply listening, but the third claim definitely is, and it is something particularly appreciated by users of the PRO 750: the “sound pressure” that has always been a part of listening to headphones with a high gain setting, is conspicuously reduced. Ultrasone claims “up to 40% less” of this effect than when using other headphones, with a consequent decrease in the likelihood of damage (or further damage) to the user’s hearing, as well as in listening fatigue. It would be difficult to exaggerate the added degree of comfort this provides, psychologically as well as physically and aurally.

Even apart from the sound itself, it is worth mentioning that the PRO 750 is the most comfortable set of “over-the-ear” headphones I’ve ever used, for this, too, reduces listener fatigue. In place of the leather or artificial leather (“leatherette”) ear pads on many other makes, which can become sweaty and crack in frequent use, the 750’s pads are plush velour, and if it should happen that replacement is called for, one simply rotates them off and rotates the new ones on. (A spare pair is included.) The frame that arches over the user’s head does not clamp down all the way across, but rests on a velour cushion under its centre, eliminating a common source of headphone discomfort and, as I understand, functioning as part of the acoustical design (rather like those spikes under my B&W 801 speakers).

Not everyone experiencing hearing loss will be able to realise the same benefits in listening to recorded music with headphones, but many do, and it's definitely worth a try. If you find that this works for you, you may then wish to proceed with some refinements that constitute more than "tweaks," as described below.

Getting the Most from Your Headphones

While the PRO 750 and the other excellent and reasonably priced options discussed here are impressive when simply plugged into the headphone jack on a system's preamplifier, or even a jack on a CD player, they are more richly satisfying when used with a headphone amplifier. Such a device, which may be large or small, battery-powered or using house current, is designed to "power up" headphones in more or less the same way a power amplifier feeds sound to loudspeakers, and ought to be part of the serious listener's set-up. The headphone amp I've been using is the Xin Feng Reference unit, priced at US \$280. It is smaller than a package of cigarettes, powered by four AAA batteries (which will last for quite a long time), very simple to hook up, and has its own gain control. Because each unit is individually handmade by Xin Feng in Corvallis, Oregon, USA (www.fixup.net), you may have to wait weeks or even months for delivery; your patience will be handsomely rewarded.

If you do choose to use a headphone amplifier, remember that it *is an amplifier*: you will find that its full benefits are revealed when you connect it and your headphones the same way you connect a power amplifier and loudspeakers, rather than simply plugging the headphone amp into a headphone jack. Most preamplifiers now offer connections to two or three different power amplifiers. My Bryston MP26 preamp, for instance, has outputs for one pair of balanced cables (XLR connectors) and two pairs of unbalanced ones (RCA pins). A headphone amplifier would normally be hooked up to one of the unbalanced pairs. (Be sure to use the outputs for an amplifier, *not* the "tape out" connectors.)

A similar connection, with similarly impressive results, might be made to the "variable output" on a CD player that provides that option as well as a "fixed output," but hooking up to your system's preamplifier allows you to use the headphones to hear all the input units in your system – LP, radio, tape, etc. – as well as CDs. In either case, set the gain control on the preamp or CD player to a "normal" listening level and use the gain control on the headphone amp for additional gain.

Do try to minimise the number of adaptors or connectors you use, as each may reduce the performance of your components to some degree. The cable supplied with the PRO 750 terminates in a full-size (6.3mm) plug, fine for connecting directly to the headphone jack on a preamplifier or CD player, but not for the little Xin Feng headphone amp, which has only 3.5mm jacks for both input and output. The ER and Shure "in-the-ear" units are designed for these smaller jacks. The Sony MDR 7506 cable terminates in a 3.5mm plug that screws into a 6.3mm one, providing a very solid connection, and some of Ultrason's less ambitious models have this feature, but Ultrason's treatment for the PRO 750 is to provide a step-down adaptor for attachment to the 6.3mm plug. I found it worthwhile, since the cable on the Ultrason unit is detachable, to replace it with one terminating in a 3.5mm plug; the cost was only about US\$20, the elimination of the adaptor did make a difference, and the replacement cable, about 15 feet long, allows for a little more mobility while listening.

To connect my Xin Feng headphone amp, with its 3.5mm input jack, to my preamp (or my back-up CD player, a Denon DCD 1650AR CD), I used a “Y” cable, made for hooking up an audio system to a computer. (To repeat, the output connectors on your preamp should be those for an amplifier, *not* the “tape out” option for connecting to a computer, and if you connect to a CD player be sure it is to the “variable output” jacks.) The increase in overall clarity, definition and richness, as compared with the headphone jack connection, is not merely appreciable, but downright stunning, for both the Ultrasonne PRO 750 and the Etymotic ER-4S, with the latter suddenly delivering a good deal more bass and the former pushing back limitations that hadn’t been suspected until they disappeared.

One of the most revealing tracks, using the PRO 750 in this configuration was the “Musique des Automates” from Delibes’s *Coppélia*, in an unedited transfer from the old monophonic LP with the Covent Garden Orchestra under Robert Irving: here was an outright revelation of details – small percussion, violin pizzicati – which I had never imagined, and certainly hadn’t heard before, either from this track *or* the LP itself. The overall richness in such recordings as Maazel’s Cleveland Orchestra *Russian Easter Festival Overture* on Decca, the wildly exuberant brass and drums, with that “sizzle” punctuation, in Vernon Handley’s account of the scherzo in Granville Bantock’s *Pagan Symphony* on Hyperion, the Hagen Quartet’s peerless realisation of the finale of Haydn’s *Horseman* Quartet (Op. 74 No. 3) on Deutsche Grammophon, and Frederic Chiu’s awesome Chopin (the first of the Opus 10 Etudes) on Harmonia Mundi was matched by a transparency which again brought to light details previously unnoticed.

I am told that this method of connecting the headphone amp to your system’s preamp may not work equally well with all makes, and I would echo Etymotic’s caveat that headphones are not substitutes for hearing aids, but this configuration, using the equipment identified here (the main system CD player is a Bryston BCD-1), has been undeniably impressive for me, and no less so for listeners with normal hearing who have tried it – and there is yet another benefit. Apart from the enhancement of the sound quality, this method of connecting the headphone amp to your system’s preamp will provide an option otherwise unavailable to users of headphones: listening together with family or visitors. When you connect to the headphone jack on most preamplifiers, your speakers are cut off, but connecting the headphone amp *to an amplifier outlet* does not cut off your power amplifier: you may of course simply turn it off when you are listening alone (and reduce unnecessary power consumption), but if you leave it on, others in the room are able to listen to your speakers, using the loudness control on your preamp, while you enjoy your headphones, using the loudness control on the headphone amp – and you don’t have to listen quite alone.