

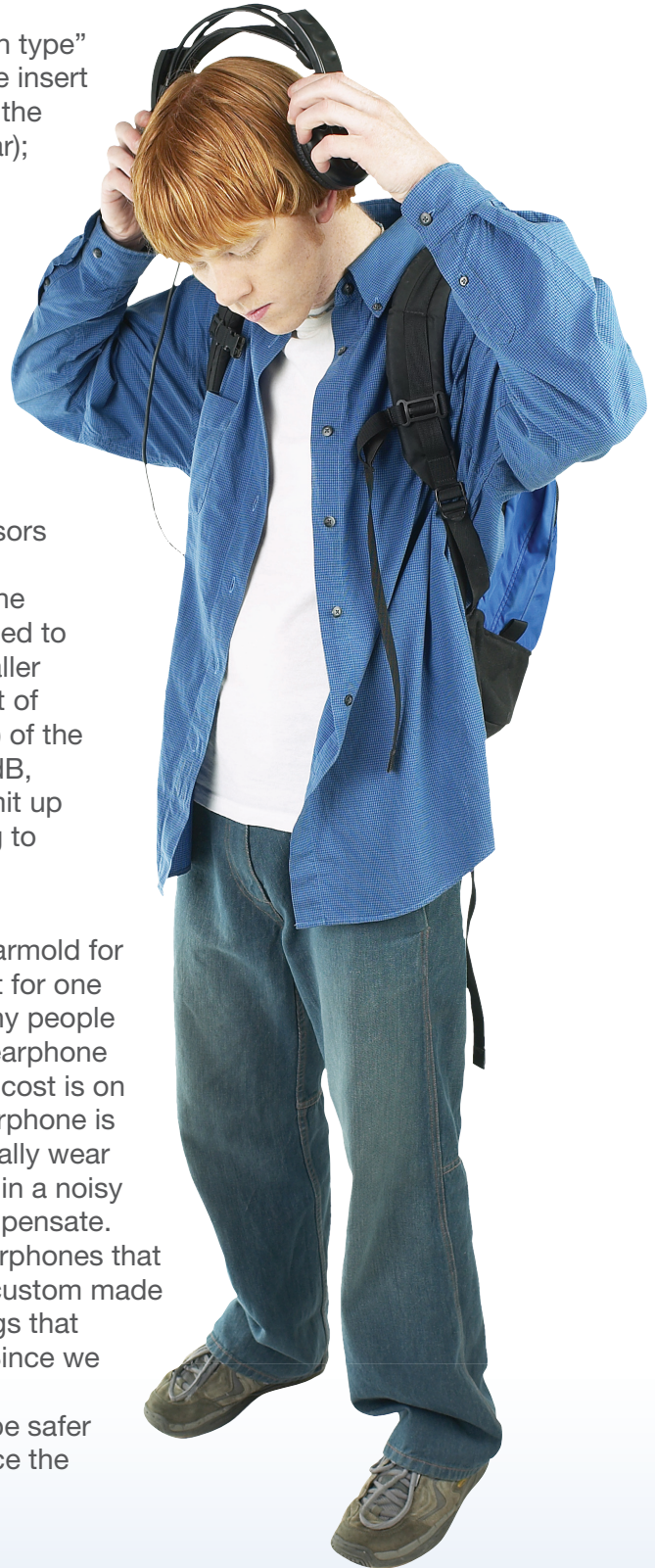
# Fact Sheet

## Fancy Earphones for Music

No longer are people wearing the large “Walkman type” earphones that were used in the 1980s. There are insert earphones that are much smaller and sit deep in the concha (the bowl near the bottom of the outer ear); custom made earphones that fit in to an earmold made for the wearer’s ear; earphones that are actually microphones; and there are noise cancelling earphones. With so many sizes and technologies it is always hard to tell which would be best for you, and whether they are worth the cost.

With improvements in miniaturization smaller earbuds (round earphones situated in the concha or bowl of the ear) became available. These felt more comfortable than their predecessors that had to be held in place over the ear with a headband. And, as a rule of thumb, the smaller the earphone loudspeaker, the less energy was needed to “drive” it, so the output was greater with the smaller earbuds of the late 1980s. The maximum amount of sound (measured in a unit called a decibel or dB) of the old style “Walkman type” headphones was 112 dB, whereas the smaller earbuds were able to transmit up to 130 dB - a level that could easily be damaging to the ear.

With the advent of smaller earphones came the possibility of being able to construct a custom earmold for an individual much like a hearing aid is made just for one person. An earmold impression is made and many people can now listen to their favourite music using an earphone that fits their ears like a good pair of shoes. The cost is on the order of \$120. With custom earmolds the earphone is a great background noise isolator - you can actually wear the earphone with your MP3 player or CD player in a noisy place and not have to turn up the volume to compensate. There are actually a number of “after market” earphones that can be purchased that either are designed with custom made earmolds in mind, or use foam or flanged earplugs that isolate the wearer from the noisy environment. Since we tend to turn up the volume of our music in noisy environments, these isolator earphones tend to be safer for the ear. A drawback is that you may not notice the truck backing up, so beware when jogging.



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Other than these isolator earphones, technology that was first reported on in 1933 is now commercially available. This is the use of active noise control, or “noise cancelling headphones”. These devices actually generate sounds that are indistinguishable to the environmental background noise, but 180 degrees out of phase – it is like the peak of an ocean wave meeting a trough; they tend to cancel each other out. These noise cancelling headphones have the result of being able to lessen the low frequency background noise by up to 12 decibels. This means that you can listen to your favourite music without the distraction of airplane cabin noise. Noise cancelling headphones don’t get rid of all of the noise but they take the edge off the irritating ones. These earphones sold for over \$500 a mere five years ago, but now can be obtained for less than \$100.

Finally for those who like to talk to their friends while driving a motorcycle or bicycle, an earphone can also be used as a microphone for two-way communication. We have all experienced plugging our ears and hearing ourselves talk louder. This is because much of our voice not only goes out of the mouth, but is transmitted to the ear canal! When we plug our ear up with an earphone, not only can we hear someone else, but it acts as a microphone to transmit our voice to our friends on the other motorcycle or bicycle.