

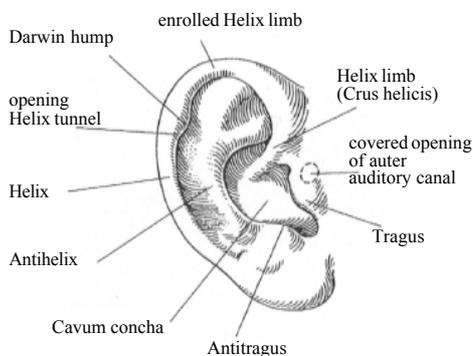
THE ACOUSTICAL FUNCTION OF THE EARLOBE:

The perceived sound information is divided by the "Anthelix" into two parts. The first part is going directly, from the edge of the "Anthelix", into the auditory canal.

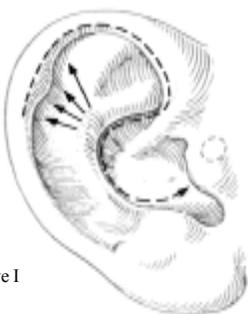
The other part of the sound information is diverted to the entrance of the "Helix tunnel" then follows through this tunnel and only then will it reach the auditory canal.

The distance of this soundwave is appr. 66 mm. Or 0.2 milliseconds time delay.

It is possible to demonstrate this by obstructing the passage of the 2nd soundwave with ones fingers.



sound-wave II



sound-wave I

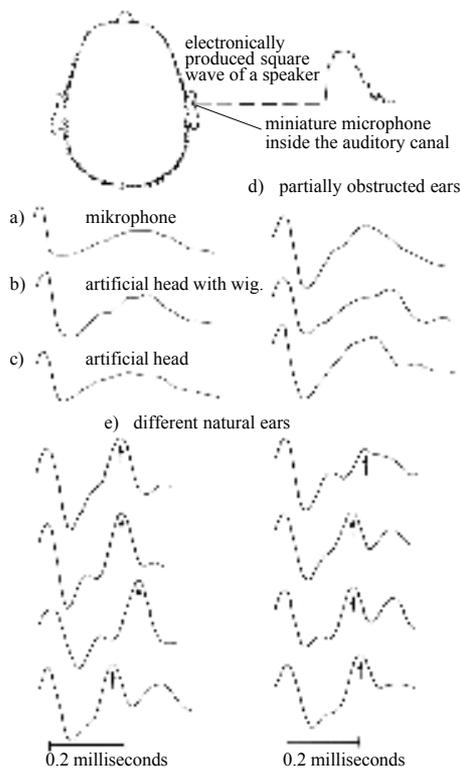
This experiment confirms the theory of the two soundwaves.

The test has been done in the following way: A square-wave of 0.14 milliseconds has been reproduced through a loudspeaker placed 90 degrees on the side to the test object. A mini-microphone, which does not obstruct the edge of the auditory canal, has been placed into the different models.

The first, direct sound-wave remains the same with all the models.

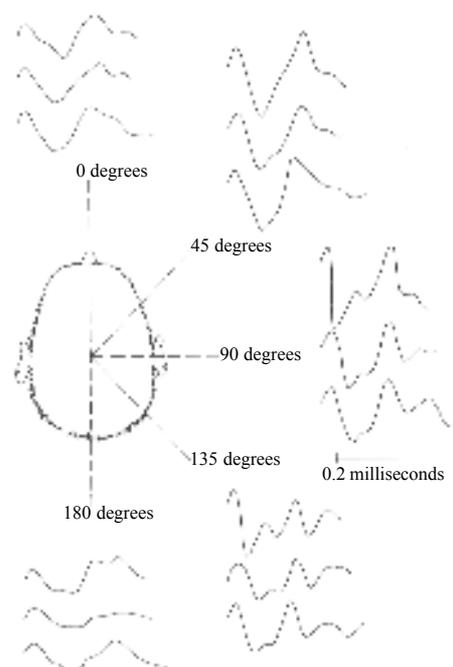
The 2nd, indirect soundwave however, changes dramatically from the models to the natural ears, in which the 2nd soundwave is also very pronounced.

(nearly as strong as the 1st sound-wave.)



THE HORIZONTAL SOUND LOCALISATION WITH ONE EAR.

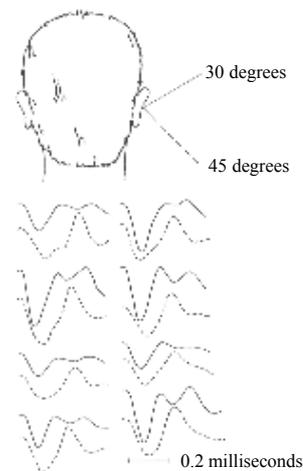
The intensity of the first direct sound-wave changes, depending of the angle of dispersion of the sound. With the 2nd indirect soundwave, this change is much more marked. The ideal angle of sound-dispersion should therefore be between 45 and 90 degrees. By watching people with a defect in hearing one can notice, that they turn their head to the source in such a way, that they can receive the soundwaves in the optimal angle. i.e. between 45-90 degrees.



THE VERTICAL SOUND LOCALISATION WITH ONE EAR.

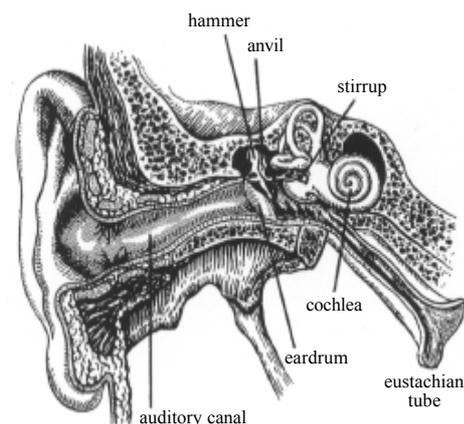
The top line shows the reception of sound originating 30 degrees above the edge of the auditory canal.

The lower, dotted line, shows the reception of sound originating 45 degrees below the edge of the auditory canal. The displacement of the indirect 2nd sound-wave in time delay is an important factor, also the intensity and form of the 2nd soundwave changes dramatically. The optimal angle of dispersion should be between the two extremes.



THE EAR.

The sound passes through the auditory canal and then reaches the eardrum. Here the mechanical charge is transferred with the "hammer, anvil" and "stirrup" to the inner ear "snail". The auditory nerves or "palpate cells" are distributed in the following manner in the inner ear. Near the larger opening we find the auditory nerves for the high frequencies and at the end the ones for the low frequency. Therefore, one can explain, why an overload of the ear with low frequencies, will damage the hearing of high frequencies first.





the HEADPHONE

Natural music listening at its very best. In developing the ERGO an extensive study of the anatomy and acoustical properties of the head and ear was considered essential to the total design process.

These studies showed that when embarking on the design of the ERGO range, there was no point in following the traditional design path by developing just another conventional headphone. It was clear from the outset that original thinking was vital to ensure a high quality headphone, with distortion free reproduction, maximum comfort and absence of listener fatigue.

Here are the important human engineering features that the TELOS design team together with Precide incorporated into their design.

A) The ERGO headphone rests lightly on top of the head, the weight, mere ounces, distributed over a large insensitive surface.

This light weight and soft foam headband cushion result in complete freedom from pressure and allows the scalp to "breathe" naturally.

B) A foam strip, at the rear of each speaker panel, rest lightly behind each ear. These do not contact the ears to cause any deformation, which would obstruct the natural soundfield created by the speakers.

C) the speaker panels are fixed in the correct position to maintain optimum vertical and horizontal angles of sound dispersion.

D) Since the speaker panels do not physically contact the ears, the intervening spaces permit a fresh air-flow from below the ears, which avoids the heat, perspiration and listener fatigue so commonly experienced with conventional headphones.

Conventional headphones distort the shape of the outer ear and pump sound directly into the auditory canal depriving the ear of its natural function.

Such headphones may have a wide frequency response, but by contacting and deforming the ear they lose or distort the second (indirect) soundwave information, resulting in unnatural sound reproduction and listener fatigue. In addition, by pressing the ears against the head or enclosing them completely, conventional headphones cause discomfort by closing off the free circulation of air around the ears, i.e. nature's health exchange system.

Most users of conventional headphones (especially Walkman-type units) listen at excessively high sound levels.

The reason is that the brain is subconsciously searching for the important missing second (indirect) soundwave information, for which the user attempts to compensate by increasing the sound level.

It is this elevated sound level which can produce irreparable ear damage.

ERGO headphones reproduce sounds, in a manner quite unlike other headphones quite free of coloration or distortion, clean and natural.

Their unique quality of design and construction ensure sounds superior to that of many speakers on the market.

With ERGO headphones, you can listen to music for extended periods of time without being conscious of wearing headphones and without the usual fatigue associated with conventional headphones.

The ERGO model 1 and 2 utilize rugged and reliable dynamic-type reproducers. Both models can be connected directly to the standard 6.3 mm headphone sockets of a stereo amplifier, receiver, tape deck, CD player or TV.

The ERGO 1

is equipped with two dynamic drivers, with thin membrane diaphragms. Thanks to the acoustical correct placement of the drive units, the sound is clear and uncoloured.

The high quality sound and reasonable price of the ERGO 1 surprises everyone.

The ERGO 2

is also equipped with two dynamic speakers, which employ neodymium magnets, even thinner membranes and are aperiodically damped to reduce distortion to a minimum. The result is sound reproduction which is open, transparent and uncoloured, it approaches that of an electrostatic system.

The ERGO A.M.T.

employs a completely new drive unit, the Air Motion Transformer.

The Membrane works with a transformation of 5:1, i.e. the air movement is 5 x greater than the movement of the membrane. The unfolded membrane is 175 x 88 mm large.

These speakers are manufactured by Precide to meet the highest quality standards, based on the Theory of Dr. Oskar Heil.

The most remarkable feature of the AMT Speaker units is the extremely fast reaction to impulses, this ensures correct phase relationships and excellent dynamics.

You can detect details in the music, which simply cannot be reproduced by other speakers.

Even after long hours of listening to this system, stress symptoms will not occur. This is specially due to the correct phase and in particular the total absence of the partial frequency distortion, always present in any suspended three dimensional object, when moved.

The ERGO A.M.T. headphone can be used with either its designated amplifier (ERGO AMP1) or with the adapter (AMT), which allows the use of your amplifier and incorporates a switch for speakers/headphones.