

*E A R   A N D   H E A R I N G   -  
S C R I P T S   F O R  
A U D I O - V I S U A L  
P R O G R A M M E S .*

REG. NO.8808

INDEPENDANT PROJECT SUBMITTED AS PART  
FULFILMENT FOR THE FIRST YEAR OF THE MASTERS  
DEGREE IN SPEECH AND HEARING TO THE  
UNIVERSITY OF MYSORE.

ALL INDIA INSTITUTE OF SPEECH & HEARING

MYSORE 570 006

*DEDICATED TO :*

MY PARENTS  
&  
MY SISTERS

Who encouraged me throughout.

AND

To ALL The People

Who get to see the completed AV programmes.

\*\*\*\*\*

## CERTIFICATE

This is to certify that the Independent Project entitled "Ear and Hearing - Scripts for Audio-Visual Programmes.", is the bonafide work, done in part fulfilment for the First Year of the Masters' Degree in Speech and Hearing, of the student with Register no. 8808.

  
Dr. N. Rathna,

Director,

A.I.I.S.H.,

Mysore 570 006.

## CERTIFICATE

This is to certify that the Independent Project entitled "Ear and Hearing - Scripts for Audio-Visual Programmes" has been prepared under my supervision and guidance.



Dr. (Miss) S. Nikam,

GUIDE,

Professor & Head,

Audiology Dept.,

A.I.I.S.H.,

Mysore 570 006.

## DECLARATION

I hereby declare that this Independent Project entitled "Ear and Hearing - Scripts for Audio-Visual Programmes", is a result of my own effort under the guidance of Dr.(Miss) S.Nikam, Professor and Head of the Department of Audiology at A.I.I.S.H., Mysore, and has not been submitted earlier at any university for any other Diploma or Degree.

MYSORE.

Register No. 8808.

DATED - May, 1989.

## **ACKNOWLEDGEMENTS:**

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INTRODUCTION.

Man has come a long way from his animal skin and stone axe days. His life now consists of electronics, chemicals, as well as a variety of art and social functions. No longer are meagre food, simple shelters or bare clothing enough for him. The human being is always striving towards sophistication in his lifestyle these days.

He has achieved a great deal in areas of science and technology along with those of the fine arts and economy. There are so many improvements in our life these days, in fact, that no one person alone can actually keep count of all of them.

With sophistication, the need for accuracy and precision has increased tremendously. The advance in all the different disciplines is simply too much now for a single person to improve his skill on. Thus came the need for specialisation in particular areas.

In the course of time, those specialising in particular areas of study have not been able to give enough attention to other areas. These areas are neglected as a result, even if they happen to be important. The area of audition and the process of hearing is one field which has been ignored because of increased specialisation.

Not many people spend any time on their ears nor do many give much of a thought for hard of hearing individuals. This may have occurred because hearing has for a long time been accepted as a matter of fact. The sense of hearing is not something that is noticed easily, as is vision. Individuals with hearing impairments are often able to escape notice by using their vision and not committing themselves to anything. It is at this point that lives may be affected by lack of knowledge. The lack of hearing affects our communication and therefore our efficiency in living our lives well.

Only those working in the field of communication can fully appreciate the importance of hearing. It is up to these specialists, therefore, to bring to the general public, an awareness of the role of hearing in our lives. Educating the public in this aspect will aid in the early diagnosis and early rehabilitation of hearing impairment. The hearing impaired person need no longer be as handicapped as he would be without early rehabilitation.

This project deals primarily with educating the public on the function of the ears and how they may be cared for. Included are the problems that could arise and harm our ears and consequently, our ability to hear. It also is directed to teach people about the use of hearing aids and their maintenance. Something about the role of speechreading in all our lives is also considered.



The presentation of this information to the public should be convenient to the presenter and efficient in its purpose of teaching the public. There are many public education pamphlets which have been published and circulated. These, however, are available only in certain centres and are usually given only to those who already have a problem. Further, pamphlets give only a two dimensional idea of what is communicated. It is found that only those who have been briefed earlier and given demonstrations can understand the material in the pamphlets.

This project has therefore used the audio-visual mode. Auditorily presented material with visual supplements has been found efficient in aiding learning. Slide projectors and videos have proved their worth in classrooms and in public education programs. Thus, the following scripts given have been prepared with these instruments in mind.

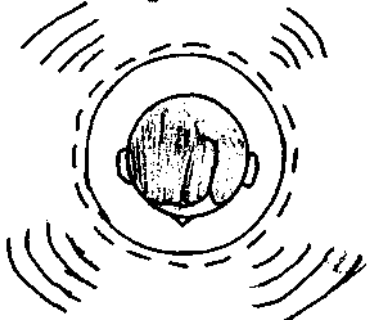
The following pages contain the scripts for four different programmes which may be made use of as video programmes or as slides.

## NORMAL ASPECTS OF THE EAR.

Title :-YOU AND YOUR EAR

## VISUAL

- \* A person playing an instrument-veena.
- \* A group of people talking.
- \* The focus is on two girls in the group speaking conspiratorily.
- \* The focus is on the speaker.
- \* A person speaking to a large group of people.
- \* Two girls speaking together quietly.
- \* See Figure



- \* Face of a clock with dials moving very fast.

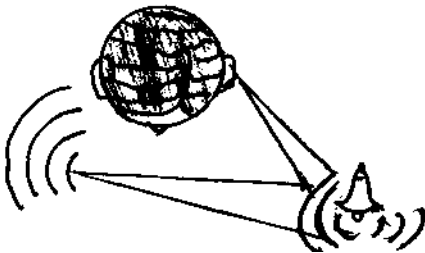
## AUDIO

- \* The wonderful world of music! (background music)  
We enjoy it because we can hear.
- \* We can communicate with others because we can hear and listen to what they say.
- \* "Have you heard? Dinesh has come down on a holiday."  
Being able to hear helps us learn of events.
- \* Besides hearing others though, we get to monitor our own speech in terms of loudness and pitch.
- \* We tend to speak louder when in front of a large audience, while
- \* we speak softly when talking to a friend at a close distance.
- \* All this listening to speech and music, however, is only a minor duty of the ear. Its most important and foremost duty is giving a full 360\* warning sense of distant danger. Our ears are the only sense organs which warn us early enough of a fire (fire alarm) or an oncoming vehicle (bus horn).
- \* Important as this duty is, the ears cannot rest at all, unlike our eyes, when we sleep. All sounds are heard, even in deep sleep. (The clock's alarm rings). This is probably what makes it possible for us to wake up to an alarm clock.

## 2.2

- \* The focus is on the ear of a person
- \* Crossectional model of the ear. (a pointer is used to show the outer ear.)
- \* Crossectional model of the middle ear is shown.
- \* A crossectional model of the inner ear is shown with the pointer.
- \* The auditory pathway is shown on the model with the pointer.
- \* The whole model of the ear is shown. as an example.
- \* A person's pinna with a decorative earring in focussed upon.
- \* What makes the ear tick and why does it yet remain so neglected?
- \* The ear is divided anatomically into 3 parts excluding the auditory pathway. The outermost portion is the external or outer ear.
- \* This air filled cavity is the middle ear,
- \* and this is the inner ear.
- \* Beyond is the auditory nerve which reaches the brain, via the auditory pathway.
- \* Do not be deceived by the size of the structures in the figure. They are extremely small, the pinna being the largest.
- \* The pinna may be mistaken to have only the function of decorating, but in fact it acts as a receiver and concentrates the sound into the ear canal.

- \* See Figure.



- \* The graph of the frequency response of outer ear
- \* In addition, it helps in locating the direction of a sound. The ridges and irregularities deflect some of the sound frequencies and allow others to enter the ear canal. This filter function is performed along with the auditory meatus, the ear canal.
- \* The frequencies between 3000 and 5000 hertz are emphasized most, as shown in this frequency response curve.

## 2.3

- \* A figure of the ear canal is shown.  
  
Cerumen, on a piece of paper is shown.
- \* A figure showing the eardrum at the end of the ear canal.  
  
A drum being stuck.
- \* A figure of Sound waves striking the eardrum.
- \* A figure of the middle ear cavity.
- \* Crosssectional figure of the eustachian tube.
- \* The ear canal is an irregular path leading into the main parts of the ear. Deeper inside are glands that produce cerumen, a toxic and waxy substance, commonly called wax. This substance has been known to reduce the swelling caused by insect bites.
- \* The irregularity of the canal and the cerumen prevent the entry of foreign objects and bacteria which may damage the tympanic membrane. This membrane marks the end of the outer ear. It has the appearance and function of a drumhead and is hence called the Eardrum. Being quite large, it is made up of three layers and has a God given ability to repair a tear by itself.
- \* Its function is to vibrate when sound waves strike it. It is so sensitive that even A weak sounds that vibrates it only a fraction of an inch, is heard. It passes on the vibrations to the middle ear, which lies on its other side.
- \* The middle ear is a six sided cavity filled with air. It contains several structures.
- \* On the anterior wall is an opening which leads out into the eustachian tube. This ventilator of the middle ear opens into the nasal cavity, which in turn connects to the throat and oral cavity.

## 2.4

\* A pointer shows the words "atmospheric pressure"

\* Figure of the ossicular chain is shown.

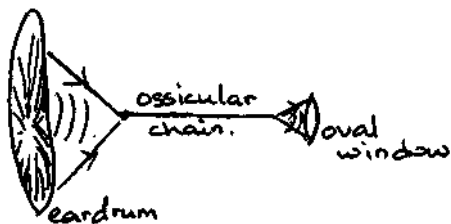
\* The pointer points to all the bones one by one.

\* The main function of the tube is to keep the air pressure in the middle ear equal to atmospheric pressure. This is required for the maximum functioning of the eardrum.

\* The other structures are mainly concerned with the transmission of the sound vibrations into the inner ear.

\* These structures are the ossicles; the tiniest bones in the body. They are supported by ligaments. The malleus or hammer receives the vibration from the eardrum. This is the incus or anvil and this is the stirrup, more technically called, the stapes. This last ossicle has the reputation of being the body's smallest bone. It transfers the vibrations onto the inner ear through a small oval opening, the oval window.

\* Show Figure



\* A figure of the middle ear muscles and ossicles is shown.

\* The ossicles act as a transformer and impedance matcher. They concentrate the vibrations of the eardrum onto the much smaller oval window in such a manner that the force on the oval window is not so great as to tear it.

\* Apart from this protective device, the middle ear has the ability to reduce the danger of extremely strong vibrations that may occur because of very loud noise.

## 2.5

- \* Arrows indicate the direction in which the ossicles are pulled by the muscles.
- \* The middle ear muscles play the main role despite their small sizes. The stapedius, incidentally, is the smallest muscle of the body. Along with the tensor tympani, it reacts very quickly to loud noise. Both muscles then pull the ossicles towards each other to build up a high resistance to the vibrations. Thanks to this action, the delicate structures of the inner ear are protected from excess force.
- \* A figure of the oval window and the inner ear.
- \* We come across these delicate structures on entering the oval window. Two paths lead away from it.
- \* A figure of the vestibular system.
- \* Along the posterior path is a bulge followed by three semicircular canals.
- \* A picture of a person running.
- \* These are the organs of balance and posture. They help us keep our balance while we walk, run, skip, or do any of a myriad things.
- \* A figure of the cochlea.
- \* The other path leads up to the hearing apparatus, the cochlea. This coiled up structure contains three compartments. The lowermost one ends in the round window, a flexible membrane. This membrane bulges into the middle ear if the pressure of the fluids increase.
- \* A cross-section of the cochlea is shown.
- \* The fluid that I mentioned is what the whole labyrinth, or inner ear, is filled up with. The perilymph and the endolymph help support the structures inside, most importantly, the hair cells and their cilia.

## 2.6

- \* A Crosssection of the organ of Corti is shown.
- \* A figure showing the process of neural excitation at the hair cell level is shown.
- \* A schematic figure of the auditory pathway is shown.
- \* A Crosssectional model of the whole ear is shown.
- \* A picture of the temporal bone on the skull.
- \* Show a picture of a pinna with perichondritis.
- \* A picture of a cauliflower ear is shown.
- \* The fluids are set into motion when the stirrup vibrates against the oval window. This causes the cilia to bend.
- \* Bending of the cilia causes an electrical discharge in the nerve. The auditory nerve carries the impulse upto the brain along what is known as the auditory pathway.
- \* The nerve fibers halt at several centres on the way. Most cross over to the opposite side. This means that a sound heard in the right ear will be represented on both sides, or hemispheres, of the brain.
- \* This complex mechanism then allows us to hear. Important as it is, nature has thoughtfully provided many protective measures against damage.
- \* One of these is the casing for the ear. The petrous part of the temporal bone is the hardest bone in the body and houses the ear. Not all that nature gives is enough for our ears, though. Many a time infection or trauma are the cause of hearing loss but these are preventable.
- \* Damage to the pinna can be caused by regular hitting. Boxers especially are prone to perichondritis.
- \* Infection of the layer above the cartilage often can lead to the painful cauliflower ear. Prevention of damage and early treatment of infection can prevent this.

- \* A picture of a person inserting a hairpin into the ear.
- \* A picture of ear canal blocked by some foreign body. Earmolds are shown also.
- \* A picture of a torn eardrum.
- \* A picture of a ear with acute otitis media
- \* A schematic figure of the eustachian tube in adults and children.
- \* A figure of the ossicular chain which has been fractured.
- \* A person closing his ears because of loud noise
- \* Damage can also occur to the ear canal by the simple act of inserting a foreign body in.
- \* Infection can result from or may be caused by fungi. Swimmers are also prone to infection of the ear canal causing pain and itchiness. Covering the ears with molds while swimming prevents this.
- \* The delicate eardrum may be torn beyond repair by sharp inserted objects is used.or a blast near the ear.Infection of the middle ear can also tear the eardrum.
- \* This is usually the result of bacterial entry from the eustachian tube.
- \* Or due to the malfunction of eustachian tube, there may be a lower pressure than that of the atmosphere. Infection from the nose,throat or even from an infected tooth can travel upto the ear.  
In children, the tube is shorter and more horizontal, so the infection passes more readily to the middle ear. Hence, early treatment of any infection in the outer ear, nose, or throat should be taken care of.
- \* Apart from direct infection, fracture of the ossicles can result from head trauma or excessively loud noise.
- \* Loud noise has been known to cause damage to the delicate middle and inner ear structures. In doing so, there results hearing loss, giddiness and strange noises heard in the head.



- \* A chart showing the drugs harmful to hearing, e.g. streptomycin and garamycin.
- \* A picture of an old man with a hand behind a ear.
- \* A chart showing the warning signs of infection :-  
Hearing loss,  
Ear discharge,  
Ear ache,  
Noises in the ear,  
Giddiness.
- \* Damage to these structures can be brought about by the consumption of certain drugs as well. Sometimes these life savers are used as an emergency and hearing is sacrificed.
- \* As age advances, the ability to hear acutely diminishes. Hair cells and nerves are destroyed. The ossicular joints may get more rigid and the eardrum less tensile. Although this is not always preventable, one may take care to ensure that nothing else contributes to hearing loss.
- \* So take care, and watch out for the warning signs. A specialist in hearing will easily help you out before it is too late. Your ears do so much for you. So help them to help you.

\*\*\*\*\*

**TITLE :- SPEECH RAEDING : AN AID TO SUCCESSFUL LISTENING.**

**VISUAL**

- \* Two men talking to each other. One of them gesticulating.
- \* A girl who has been watching them faces the camera to speak
- \* Focus is back onto the two men.
- \* The girl faces the camera again.
- \* Chart showing the word speechreading.
- \* The girl faces the camera.
- \* The two men talking. Focus is on the speaker. He makes faces to show anger, boredom, joy and sadness.
- \* The girl in front of the camera.
- \* The two men talking without gestures. The listener cups his hand over his ear. The speaker gesticulates.

**AUDIO**

- \*(Music)
- \* "Hello, I'm . . . . , your host. Did you see those men talking? They look quite ordinary. But there is something special that they are doing
- \* and which all of us do too.
- \* We all speechread. Now, speechreading is not done only by the deaf as many people think. All of us rely on visual clues also in understanding others.
- \* What is this speechreading, one may ask.
- \* Well, this a way by which we get clues, apart from what we hear about what the speaker is talking.
- \* 'Lipreading is just a part of speechreading. So is observing the gestures of the speaker. With speechreading, we can make out if a person is happy, interested or angry.
- \* Although we rely more on our hearing to understand speech, sometimes these auditory clues get disturbed.
- \* Noise.

## 3.2

- \* The girl speaking nearby.
- \* Too much noise will not let you hear those valuable auditory clues. It can be a real mess, especially if the message is important. This is when speechreading gives us the necessary clues, so that we get the gist of the topic at least. Here's another scene where speechreading comes in handy.
- \* A classroom scene. The teacher asks a question and a student answers. The others turn to look at the student.
- \* The talking in the classroom by the teacher and the students.
- \* Back to the host.
- \* There was no excessive noise in there, but a lot of valuable information was being passed along. People tend to speechread in such situations so that they will not be affected greatly on missing any auditory clues.
- \* Chart with "How does speechreading help ?"
- \* "How does it do this ?" Well, as said earlier, the most important clues to understanding speech are obtained through the auditory mode. Even so, some clues come in the visual form. Read this sentence:
- \* Girl mouths out "How are you ?"
- \* It is possible to make out the different sounds without auditory clues. In case of important information being transferred or too much disturbance around, it is possible to make use of speechreading only. It is hardly necessary to try to speechread, as most people do it without special training.

- \* Chart with "Who uses speechreading?"

Who are these people who use speechreading so much?  
The answer- practically everybody!;
- \* The two men talk and smile at camera.

\* Our two friends use speechreading.
- \* Girl points to herself and then at camera.

\* I use speechreading and I'm sure you use it too.
- \* A hearing impaired child listening to his mother.

\* It is especially useful for hard of hearing individuals. Because these people do not have a normal auditory system, they tend to rely more on the visual sense, for more clues.
- \* The hearing aid worn by the boy is focused on.

\* Hearing impaired children like this young boy here, learn to speechread from a very young age. They speechread even if they are given a hearing aid or taught a sign language.
- \* The girl talks facing the camera.

\* This activity should in no way be discouraged but encouraged instead. The child must, however learn to implement the clues from his hearing aid along with speechreading.
- \* Chart showing the words: ton - none  
pat - bat  
kate - gate

\* We stress this because speechreading alone cannot tell us the difference between these words:-
- \* Girl mouths out these words silently after saying them.

\* 'ton' and 'none' , or 'pat' and 'bat', or even 'kate' and 'gate'.  
Certain people cannot tolerate the amplification of a hearing aid even if an automatic volume control is present.

3.4

\* Person with a vibrator on the waist.

\* For these hearing handicapped people, other aids may be tried or they may be taught sign language. With these, speechreading becomes almost a must.

\* Girl facing the camera

\* At such times, it becomes absolutely necessary that conditions favourable for speechreading exists.

\* Girl points to a lamp/tubelight.

\* Lighting, for example, is one such condition. The light should be in such a position so as to cause no disturbance at all.

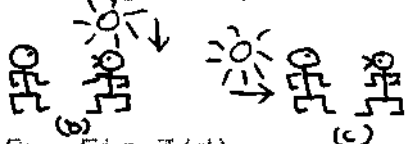
\* Move towards some charts

\* In this case, the light being behind the speaker, a shadow forms over the face and makes it quite difficult to observe the facial movements.

See Fig.3(a)



\* See Fig.3(b), (c)



\* These two conditions are much better but they too cause some amount of shadow to fall on the face.

\* See Fig.3(d)

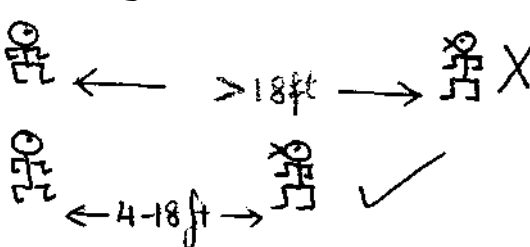


\* This condition is the most favourable. The light is in front and at a slightly elevated angle.

\* Girl talking facing the camera. The lights turn dim

\* Make sure the lighting is good, for poor lighting hardly allows you to see, let alone observe the facial movements.

\* See Fig.3(e)



\* The face cannot be seen clearly at a great distance either. That is why the recommended distance between speaker and speechreader is 4-18 ft.

### 3.5

- \* Girl facing the camera and talking
- \* The two men speaking are joined by another man. All three speak and stop. One speaks.
- \* Focus on the speaker. He covers his mouth. Removes his hand on hearing the advice.
- \* Girl in front of camera.
- \* Chart reading "What the speechreader should do ?"
  - 1) Have visual defect, if any, corrected.
  - 2) Adjust to the situation- lighting, etc.
  - 3) Don't hesitate to tell a person that you need to speechread.
  - 4) Pay attention to the speaker.
  - 5) Keep a pleasant countenance
  - 6) Maintain a wide range of interests and keep up with the news.
  - 7) Practice makes perfect.
- \* It is no use trying to communicate with a speechreader if he cannot see you, especially your mouth, clearly.
- \* Try to make things easier for the speechreader by letting only one person speak at a time, if in a group.
- \* Don't cover up your mouth and obscure important clues. You don't have to exaggerate. Just speak a bit slowly and naturally.
- \* Also, if you are not understood, then don't just repeat what you have just said, rephrase it. Using short, simple sentences helps a lot.
- \* The speechreader should help himself to an extent, of course. These pointers are usually enough. (Read through chart).

It encourages the speaker to be more helpful.

You will find it easier to keep up the conversation

### 3.6

- \* Girl facing the camera.
- \* Chart showing: Mueller-Walle method, Kinzie method, Nitchie method, Jena method.
- \* Chart of Hindi alphabets. Pointer at /p/, /ph/, /b/, /bh/ and /m/.
- \* Chart with a list of simple words.
- \* Host facing camera
- \* She moves her head towards the three men who were talking. One flings his hands up in despair and walks off. leaving the other two looking bemused.
- \* Focus on the girl
- \* "Practice makes perfect", it is easy to say. But how does one go about practising speechreading.
- \* There are many methods by which one may learn. These are long standing methods. Other new methods have come up as well.
- \* Basically, however, one can always practise by first learning to differentiate, through speech reading, the letters in each line of the alphabet. For example, these letters.
- \* Next, practise on simple words. Follow this up with more complex words.
- \* After this you should be able to read simple sentences. Try to concentrate on the meaning of the whole sentence rather than the words by themselves. With more practice, you should be able to read speech that is spoken at a faster rate.
- \* Make sure you practise in different environments and with different people. And if you should miss out on certain words don't worry. Even the best speechreaders have their bad days!
- \* Well, thanks for being with us. Goodbye for now.

**TYPES OF HEARING AIDS.  
TITLE:- AIDS TO HEARING**

**Visual**

\* A chart showing :  
Before we go into

The hearing aid question  
bank:-

- 1) What is a hearing aid?
- 2) How does a hearing aid help ?
- 3) What types of aids are these? (body level, b.t.e, spectacles and i.t.e. aids shown.)
- 4) This is the (microphone).
- 5) This part is the .... (battery compartment).
- 6) Which cell should be used by this aid ? (b.t.e. aid shown)
- 7) The volume control is for ....
- 8) This is the..... (receiver of body level aid shown).
- 9) This is an ...( earmold)
- 10) This earmold is used with a ....(skeleton earmold shown)
- 11) These are .... (single, V- and Y- cords shown)
- 12) Can all people with hearing losses benefit from hearing aids ?
- 13) Are there any special hearing aids for those who cannot use the conventional aids ?
- 14) What are these ?
- 15)How can you get the maximum out of an aid ?

**Audio**

\* (Music).

hearing aids, let's see how much we actually know about them.

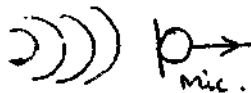


Now let s see how many were correctly answered.

- \* Four photographs shown:-
  - 1) a child with a hearing aid.
  - 2) a teenaged girl with a b.t.e. aid
  - 3) a teacher with a spectacle aid
  - 4) an executive with an i.t.e.
 Focus is on the hearing aids worn

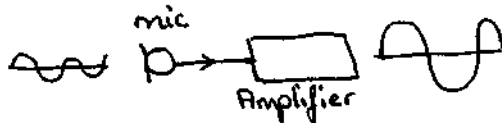
- \* Look at these four people. It is clear that the child is wearing a hearing aid. But, what about the other three ? At first glance, one would assume them to be quite normal and without any hearing aid whatsoever. All of them, though, are wearing hearing aids. The adults especially, have aids that blend inconspicuously into their hair or ear and all of them work on basically the same principle.

- \* Figure is shown.



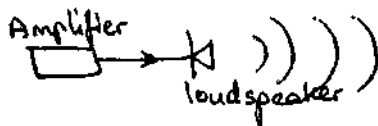
- \* They all have a microphone. This transducer collects the sound and converts it into electrical energy.

- \* Figure may be used.



- \* An amplifier increases the intensity of the electrical signal. Some aids use a two-staged amplifier while others use a single-stage one.

- \* Figure may be used



- \* The receiver is another transducer. This converts the electrical energy back into sound. This sound is more intense than the original signal. It will contain some amount of distortion. This is due to the electrical involvement.

### 4.3

- \* Photographs of the volume controls on different hearing aids
- \* Photograph of a child wearing a body level hearing aid.
- \* Photograph of a single cord
- \* Photograph of a V-cord
- \* Photograph of a Y-cord
- \* Photographs of two pin and three pin plugs of various cords
- \* Photograph of a receiver buttoned onto an earmold.
- \* All of the aids also have a volume control. This is provided to adjust the loudness of the signal from the receiver. You will notice that each aid is somewhat different from its relatives.
- \* This child is wearing a body level hearing aid or pocket aid, as it is sometimes called. Notice how his aid is clipped onto the hearing aid harness. Two wires or cords carry the electrical signal to the receivers. These are at the ear level.
- \* Different types of cords may be used. This, as you can see, is a single cord.
- \* This is used to connect one hearing aid to both ears. This cord looks like a 'V'. It is hence called a V-cord.
- \* This Y-cord comes along with some of the older hearing aid models.
- \* These cords come usually with two pin plugs. Some of the older models of hearing aids still use the three pin plug.
- \* Here, you can see the receiver buttoned onto a full earmold. The earmold fits into the ear of the hearing aid user and allows the sound from the receiver to enter directly into the ear.

#### 4.4

- \* Photographs of two pin and three pin plugs of various cords
- \* Photograph of a receiver buttoned onto an earmold.
- \* Photograph of the child with the body level hearing aid
- \* Photograph of the teenager wearing a b.t.e.
- \* Photograph of a b.t.e. fitted to a skeleton earmold.
- \* Photograph of a teacher wearing a spectacle aid
- \* Photograph showing only spectacles aid connected to a skeleton earmold via a tubing.
- \* These cords come usually with two pin plugs. Some of the older models of hearing aids still use the three pin plug.
- \* Here, you can see the receiver buttoned onto a full earmold. The earmold fits into the ear of the hearing aid user and allows the sound from the receiver to enter directly into the ear.
- \* The body level hearing aid is very useful for those with severe to profound hearing losses. They are especially useful for children.
- \* This is the behind the ear type or b.t.e.. It is more inconspicuous than the body level but can be just as powerful.
- \* The b.t.e. requires a small tubing which connects to the earhook on one end and 1 to the earmold at the other. (Now, this mold is different from the full earmold seen earlier. Only the frame being present, it is called the skeleton earmold.
- \* The hearing aid here is very cleverly contained in the framework of the spectacles.
- \* The microphone may be near the glasses or near the ear. The receiver is near the ear. It is also connected to a skeleton earmold by a tubing fitted onto the receiver.

- \* Photograph of a b.c. spectacle aid
- \* Sometimes instead of allowing the sound into the ear, one may want to pass on the vibrations to the bone so that they are conveyed directly into the inner ear. This does happen in cases with constant ear discharge or a blocked ear canal. This is called the bone conductance hearing aid as opposed to the conventional air conduction type hearing aid.
- \* Photograph of a tactile aid worn by a person
- \* Bone conductance or bone aids are also tactile aids. They are especially useful for those who cannot tolerate loud sounds or the amplified sound provided by even an AVC hearing aid. They aren't as powerful as air conduction (AC) aids.
- \* Chart showing "List of special problems fitted with CROS:-  
1) Deafness in only one ear.  
2) A very slight impairment.  
3) Uneven hearing losses in both ears.  
4) Loss only in the high frequency region.  
5) Very profound hearing loss for most frequencies."
- \* The spectacles aid is used for those with special problems, such as these. The CROS or CROS variations are used. (Read out chart).
- \* Businessman/woman with i.t.e.
- \* Last but definitely not the least is the i.t.e., the most inobtrusive of all.
- \* Photograph of i.t.e. fitted to earplug.
- \* This tiny aid is fitted straightaway into the ear canal, with a earplug. This is the canal aid.

## 4.6

- \* A canal aid shown fitted to a earplug
- \* Chart showing "Gain controls, A.V.C. Speech processors, Tinnitus Masker."
- \* Gain control on body level and b.t.e. aids.
- \* Gain control moved to 'L' to 'H'
- \* Photograph of speech processor.
- \* This is not a CROS variation by itself but is called the canal aid. It fits into the caved in space of the ear. Not as powerful as the other aids, these are used by those with losses that are not too severe.
- \* One cannot allow technology to advance without implementing it everywhere. Hearing aids have had their share, too. Several modifications have been introduced into hearing aids.
- \* The gain control is the simplest form of modification. This attachment allows the aid to be set for the users, in terms of the frequencies most needed to be emphasized.
- \* In short, it is a filter. L' is a low pass filter, and H' is a high pass filter.
- \* The speech processor is a more complicated type of filter. This cuts off the background noise, emphasizing the speech signals. It is especially useful for individuals working in noisy areas.

- \* AVC control on a hearing aid
- \* Tinnitus Masker.
- \* Direct input hearing aid with audio shoe.
- \* Auditory trainer
- \* The AVC is not a filter. It is the automatic volume control fitting on the hearing aid. You will recall that we had mentioned certain people who cannot tolerate loud sounds and yet require amplification. This modification is meant for these people. It limits the amount of amplification to within the tolerance of the individuals while still helping them hear.
- \* The Tinnitus Masker is meant for people who keep hearing a continuous sound inside the ear. This may be due to any one of the many reasons put forward earlier. What this modifier does is produce a low noise so that the ringing tone is not heard. In other words, it masks the tinnitus.
- \* Yet another modification to the ordinary hearing aid is an external microphone in addition to the one inbuilt, provided on the hearing aid. This direct input hearing aid is a variation of the b.t.e. It is used for those with very severe hearing losses.
- \* An instrument similar to the hearing aid is the auditory trainer. It is used in helping children learn to respond to different types of sounds.

Children with very great hearing losses and those without their own hearing aids benefit a lot from this desk model aid.

\* Photograph of induction loop and FM aids.

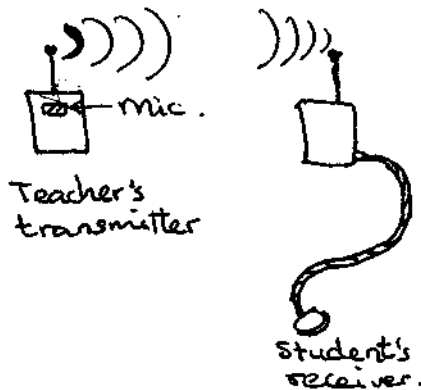
\* Aids for educating children can also be used in schools and maybe more complex than the single auditory trainer.

\* Only induction loop shown.

\* The induction loop works on the principle of electromagnetic induction. It is useful when teaching a group of hearing impaired children within a room.

\* FM Aid.

\* Another more sophisticated type of aid is the FM aid. In this the speech signal is transposed on a carrier signal, very much like signals that come through on the radio.



The teacher has the transmitting part with her while the child carries the receiver part. This way, the teacher can communicate the lessons with a large group of students.

These look end act a lot like transistor radios and the walkie-talkies that are used by the police.

\* Chart showing list  
of all aids  
"Body level aid,  
B.T.E.,  
K. T. E .,  
Spectacles aid,  
(CROS variation)  
Auditory trainer,  
Induction loops  
FM aids,  
AVC,  
Signal Processors,  
Tinnitus Maskers.

\* A large number and various  
types of hearing aids are  
available to the hearing  
impaired individual.  
But the job of selecting  
the best aid must be  
left to the professionals  
for they know the  
needs of the  
individual.



**HEARING AIDS: USE AND CARE.****TITLE :HEARING AID KEEPING****VISUAL**

- \* A child wearing a hearing aid (body level) turns towards a sound.
  
- \* Chart showing Care hints for hearing aids.'
  - 1)Free of dust. (Picture of dust storm)
  - 2)Keep it dry (a man watering plants)
  - 3)Free from shock (a b.t.e. dropped to the Floor)
  - 4)Switch off when not in use. Remove cell and store aid in cool,dry place. (Show case.)

**AUDIO**

- \* This child relies on his hearing aid to help him hear. It will over the years become his aid to safety, his tool of communication, his aid to socialising and living. A hearing aid that is not cared for will not give the maximum benefit that is required. An important aspect of hearing aid use therefore, should be the proper care of the aid itself.
  
- \* Some of these care hints apply to all types of hearing aids.
 

Always make sure that the aid is free of dust,

Do not expose the aid to moisture or humidity. Always keep it dry.

Mechanical shock is also bad for the hearing aid. Dust, water and shock are liable to damage the delicate parts inside the hearing aid.

Do not leave the aid on with its cell inside when not in use. The cell drains out faster. Also, don't leave the hearing aid lying around where it may get easily damaged. Keep it secure in the case provided.

- 5) Don't use the switches and knobs too often (Show switches on body level aid/)  
Turning knobs and switches too often loosens them and decreases their efficiency. Handle them delicately.
- 6) Keep cell terminals free of rust. (battery compartment of body level and b.t.e).  
Hearing aids run on battery power. Be sure that nothing like rust gets in the way of the power supply.
- 7) Keep earmolds clean (Picture of earmolds)  
A clear passage of sound into the ear will be of great benefit. Keep the earmolds free of wax and dirt so that sound passes easily.
- 8) Do not cover the microphone with any cloth. (Body level aid shown).  
The microphone should not be covered with cloth as this produces a crackling noise which disturbs the incoming important signal.
- 9) The one third position on the volume control is best. Show volume control on body level"  
The volume control should not be turned on and used at maximum. The one third position on the volume control is best, as least distortion and most amplification occurs here.
- 10) Change the cell every 15 days.  
In order to keep the volume control at its optimum level, make sure that the battery supply is constant. Change the cell every 10 to 15 days if the aid is constantly used.

- \* Do not adjust gain control, (gain control of a body level or b.t.e aid).  
Your audiologist would have adjusted the gain control to your type of hearing loss. Adjust it only if you have been asked to do so professionally.
  - \* T-coil. Show T-position on body level aid  
Some aids have a telecoil switch. This is used while speaking over the telephone or when an induction loop is used.
  - \* MT-position. Show on a body level aid.  
Some people want to listen to the environmental speech as well as that coming over the telephone. Since no environmental noise comes in with the T-position, an MT position is usually provided as well. This allows input from the microphone as well as the telecoil.
  - \* A person holding a telephone with receiver end near body level aid  
When using a telephone with a hearing aid, holding the receiver like this is convenient.
- 11) Body level aid  
Clip on body level aid-
- Cords.
- Single cord  
V cord  
Y cord
- The body level aid needs a special mention. A clip is usually provided to keep the aid fastened to a skirt or a pocket or a hearing aid harness. A loose clip should be tightened and then used.  
There are several types of cords:-  
The single cord,  
the V cord,  
the Y cord.  
Make sure you have the correct one when the cord needs to be replaced.

- \* Cord wound around a body level aid. Cord wound too tightly. Cord twisted in case.
- \* Pins and plugs  
  
2 pin and 3 pin plugs are shown.
- 12) B.t.e. and spectacles (tubing of b.t.e. and spectacle aid are shown.)
- 13) I.t.e. is shown.
- 14) Obtain professional help if the aid does not seem to give you maximum benefit.
- \* When not in use, the cord should be wound correctly around the aid like this and not too tightly like this or left twisted like this. These two ways may cut the cord and disturb the efficient transmission of the signal to the receiver.
- \* At the cord ends are plugs for plugging into the aid and into the receiver. There are 2 pin plugs and 3 pin plugs. Again, only one may be used by a particular aid and so should be carefully noted when replacement is required.
- \* There are no pins, plugs or cords for these aids. There is a tubing, however, and this must be cleaned regularly. An additional pointer for the spectacle aid is that the tension which holds the spectacles in place must be maintained. Regular tightening of the screws helps in this.
- \* The i.t.e. is so small that some may forget to remove the aid when going for a bath or while sleeping. All the general pointers need to be observed for the 'i.t.e.
- \* This piece of information is important as it prevents you from being further handicapped by a possibly ill-fitting aid. Remember— Help your aid to help you hear.

**BIBLIOGRAPHY**

1. Berger K.W. - "Speechreading - Principles and Methods", National Educational Press, Inc. - 2nd Edition. (1972)
2. Berger K.W. - "History and Development of Hearing Aids", in Pollack M.C. - "Amplification for the Hearing Impaired." - Grune & Stratton, New York (U.S.A.). (1975)
3. Bunger A.M. - "Speechreading - The Jena Method.", Interstate, Illinois (U.S.A.). (1952)
4. Diehl C.F. - " Introduction to the Anatomy and Physiology of the Speech Mechanism.", C.C.Thomas, Springfield. (1968)
5. Gopal N.K. - " Effects of Noise on the Auditory System.", Independant Project, Mysore University (India). (1985)
6. Hetherington J.J. - "Amplification in the Educational System.", in Pollack M.C. - "Amplification For The Hearing Impaired>", Grune & Stratton, New York (U.S.A.). (1975)

7. Lipscomb D.M. - "Noise: The Unwanted Sounds.",  
Nelson - Hall Co., Chicago (U.S.A.). (1974)
8. Pollack M.C. - "Electroacoustic Characteristics."  
and "Special Applications of Amplifications.", in  
Pollack M.C. - "Amplification For The Hearing  
Impaired.", Grune & Stratton, New York (U.S.A.).  
(1975)
9. Stevens S.S. & Warshofsky F. - "Sound and  
Hearing.", Life Science Libraries, Time Life  
Books, New York (U.S.A.). (1971).
10. Usha K.R. - "Ear, Hearing and Hearing Loss \_ What  
People Must Know" - Independent Project, Mysore  
University (India). (1985).

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