The Who, What, Why, and How of Hearing Assistive Technology
The WHO....
WHO Needs Hearing Assistive Technology or HAT?

• Potentially all children and adults with hearing loss regardless of degree and type of hearing loss
• Whether or not hearing aids, Cochlear implants, or bone anchored implants are used
WHO Else Benefits from HAT?

HAT candidacy should also be considered for the following populations (AAA, 2008)

- Auditory processing deficits
- Auditory Neuropathy Spectrum Disorder (ANSD)
- Learning disabilities
- Language deficits
- Attention deficits
- English language learners
The WHAT....
WHAT is HEARING Assistive Technology (HAT)?

Any devices, except hearing aids, that help a hearing impaired person communicate more effectively through direct sound amplification or visual or vibrotactile alerts

Also known as:
- Assistive devices
- Assistive listening devices (ALDs)
- Auxiliary aids
- Auditory Rehabilitation technology
- Hearing Assistive technology (HAT)
- Hearing Assistance Technology (HAT)
CATEGORIES OF HAT

HAT refers to a broad range of devices designed to facilitate reception of auditory information and to optimize communication:

◦ Assistive Listening Devices
◦ Alerting/Signaling Devices
◦ Telecommunication Devices
◦ Captioning Devices and Services
Four Types of Hearing Assistive Technology

Devices to assist with face-to-face communication
- Example: FM systems, Ubi-Duo, CART

Devices to assist with the reception of broadcast media
- Example: infrared systems for theater, television, movies

Devices to assist with telephone communication
- Example: Telephone amplifiers, captioned telephones

Devices to assist with the awareness and identification of environmental sounds and situations
- Example: alerting devices for phone, door, wake up, fire alarm, etc.
The WHY....

FEDERAL LEGISLATION
ROOM ACOUSTICS
EFFECTS OF HEARING LOSS
The Goal: Communication Accessibility

- Even with the arsenal of technology available today in cochlear implants and hearing aids, many individuals need hearing assistive technology to supplement the hearing aid/cochlear implant
  - Consider problems of noise & reverberation
  - Consider distance from sound source
  - Consider when cochlear implant/hearing aid is not being worn
Factors That Impact How We Hear

- Background room noise
- Reverberation (echo) time
- Distance between the speaker and the listener

Interactions among these variables
WHY? Effects of Hearing Loss

Incomplete access to speech even with amplification
- Audibility of soft speech
- Speech at a distance further than 3-6 feet
- Fragmented hearing; 20-25% of information might be missing

Decreased listening comprehension

Increased listening effort leaves fewer cognitive resources to understand speech and to perform tasks

Increased fatigue from listening/processing

Pace of learning decreases
Signal-to-noise ratio Requirements

Younger children are more vulnerable to the effects of poor classroom acoustics and require greater signal-to-noise ratio and lower reverberation time than adults.

Children with hearing loss required the SNR to be 7 dB GREATER than normal hearing peers to achieve the same speech perception in rooms under the same reverberant conditions.
WHY? It’s the Law!

Federal laws mandate that the schools create an effective learning environment for ALL students.

Federal laws mandate that employers provide reasonable accommodations for essential job functions:
  ◦ Individuals with Disabilities Education Act (IDEA)
  ◦ Rehabilitation Act
  ◦ American’s with Disabilities Act
    ◦ Title II and Title III
The Role of HAT and HAT Services

The use of HAT and HAT services.....

Strongly impacts the ability of the hearing impaired or Deaf student to access the material being taught in the general education classroom

Provides the support needed to allow the student to function as their typical peers in general education

Strongly impacts the ability of the employee to do their job with reasonable accommodation
The HOW....

ASSISTIVE LISTENING DEVICES
HOW? Hearing Better In Noisy Environments

One key to improving speech intelligibility in poor room acoustics is to improve the amount by which the desired signal exceeds the background noise.

The Signal to Noise Ratio can be improved by using Assistive Listening Devices.
Goal of Assistive Listening Devices

To Improve SNR by placing a microphone close to the sound source

- Increases the loudness of specific sounds only
  - Improves SNR
  - Minimizes background noise
- Eliminates distance between the speaker and the listener
  - Consistency of signal level
- Minimizes influence of poor room acoustics
  - Eliminates reverberation (echo)
Types Of ALDS

Principle of *remote microphone placement* is common to all types

Difference between types is the *means of signal transmission*
- Hardwired
- Wireless

If the microphone is not placed as close to sound source as possible then it is not a true ALD and benefit of improved SNR will not be achieved!
Need for ALDS

Remote microphone HAT is not just assistive technology it is ESSENTIAL technology for students and employees with hearing loss.

ALD systems allow for:

- An increased signal-to-noise ratio
- Will meet ASHA/ANSI recommended SNR of +15 dB in the classroom
- Consistency of signal level regardless of distance from the speaker and room reverberation
Why ALDs Work

Normally, due to distance, noise, and echo in a room, by the time the speech arrives at the ear of the listener it may be the same loudness as the other interfering sounds or softer, which makes it difficult to hear.

ALDs use a remote microphone to catch the desired sound at its source before it crosses the room and becomes attenuated and distorted due to distance, noise and poor room acoustics.

Listener can sit close to or far away from the speaker; the signal is the primary signal heard!

Source: http://www.bradingrao.com/
PERSONAL ALDS--common USES

Face-to-face communication

Group communication
  ◦ Classrooms, assembly rooms, meeting/conference rooms

Broadcast Media: Television/stereo/radio

Telecommunication--when used with telephone interface

Anyplace where SNR improvement is desired!!!
Hardwired Systems
HARDWIRED SYSTEMS

Generic, moderate-gain amplification devices

Listener is physically tethered to the sound source

The sound source—person talking, TV, radio—is picked up via a remote microphone either lapel, handheld, or Velcro attached

May directly connect to a sound source such as TV, radio, telephone using an electrical plug/jack connection
HARDWIRED SYSTEMS

There may be some ability to adjust loudness and some simple high-low tone settings; they are not known for their sound reproductive quality.

Useful as a last resort (temporary amplification)

Low cost should not justify their use as a permanent, primary amplification.
# Hardwired Systems

## ADVANTAGES

- Alternative amplification system
- Good for providing temporary amplification
- Fine for one-on-one communication or small groups where mobility between listener and speaker is not needed
- Portable system, easy to use
- Inexpensive option to improve SNR

## DISADVANTAGES

- Not classified as medical devices by the FDA
- No standards for electroacoustic characteristics
- Distance between the listener and the sound source is limited by the length of the cord
- Limited seating options
- Not suitable for large rooms
- Location & positioning of wires
Wireless Systems
A Wireless ALD Consists of Two Basic Components:

A battery or AC-powered transmitter with microphone at the sound source

A battery powered Receiver used by the listener

Wireless ALDs eliminate the need for a cord between the sound source and the listener
Principles of Wireless Systems

Wireless Technology
1. Frequency Modulation (FM)
2. Infrared (IR)
3. Induction (Audio) Loop
4. 2.4 GHz
3 Types of Wireless ALDs

- There are 4 basic types and which system is the best depend on the situation it is to be used, cost, maintenance, security requirements, interference, etc.

  - FM (Frequency Modulation) and 2.4 GHz Systems
    - Use radio waves
  - Infrared Systems
    - Use invisible light waves
  - Induction Loop Systems
    - Use electromagnetic signals
ALD Coupling Methods

Coupling choices are the similar for all technologies

Coupling choices will depend upon
- The hearing loss degree and configuration
- The features in the hearing aid/cochlear implant (HA/CI)
- T-coil and direct auditory input capabilities

Coupling directly to HA/CI is usually desired in order to meet individualized amplification needs
ALD Coupling Options

Without hearing aids or without telecoil/DAI equipped HA

- Headsets
- Earbuds
- Under-the-chin receiver style
- Custom earmold/snap-ring receiver
ALD Coupling Options

With telecoil/DAI equipped hearing aids
- Neckloop
- Silhouette
- Direct auditory input
Infrared Wireless Systems
Wireless Systems--Infrared

Uses invisible light waves to transmit sound from the IR transmitter connected to the sound source (TV/radio) to an IR receiver worn by the listener

Consists of a wireless mic, IR converter/transmitter, IR receiver

Transmitter connects to TV or existing PA system

95kHz transmission was universal--now systems that use 250 kHz or 2.3/2.8 MHz

System compatibility is an issue as the receiver frequency must match transmitter
Wireless Systems--Infrared

IR receiver can be an under-the-chin style or used with a headphone/neckloop

May use multiple receivers

Line-of-sight restriction because the IR beam cannot penetrate barriers

IR transmitter is AC-powered only therefore portability is restricted

Indoor use only; IR cannot work in sunlight
## Infrared Systems

### ADVANTAGES
- No seating restrictions for users
- Isolation of signal to room (privacy ensured)
- Freedom from interference from outside transmitting sources
- Can be used in adjacent rooms
- Ease of installation and use
- Excellent fidelity—widest bandwidth and sound reproduction
- Moderate cost

### DISADVANTAGES
- Receivers required for everyone
- Portability factor--transmitter cannot run on batteries
- Cannot be used outdoors or brightly sunlit rooms
- High intensity or fluorescent lights cause interference
- Line of sight requirement
- Not useful for 1:1, car, restaurant--mostly used for entertainment
Induction Loop Systems
Induction Loop Systems

Induction Loop systems use a loop of wire encircling a room that is connected to the output of an audio power amplifier.

The signal fed to the amplifier can originate from a microphone, TV or other audio source.

Once the sound enters the system it is converted to an electrical current that is passed through the loop wire to create an electromagnetic field.

Individuals sitting in the loop can receive the signal if they have a telecoil in their hearing aid or cochlear implant.

No headset/receiver needed.
Induction Loop Systems

**ADVANTAGES**

- Ease of use to the user
- Least costly system because additional receivers are not required
- Few components
- Freedom to move around within a specified area

**DISADVANTAGES**

- Vulnerable to electromagnetic interference
- Limitations of inductive receiving equipment (HA telecoil)
- Requires professional loop installer
- Magnetic field created only inside looped area
- Signal spill-over to adjacent rooms.
- Limited portability--best for fixed installations
FM and 2.4GHz Wireless Systems
Wireless Radio Systems

Consists of transmitter, mic, FM receiver and coupling accessory

Use with lapel/boom mic or connect to PA system

Transmitter & receiver must match frequency

Can use multiple receivers but not multiple transmitters

Transmission range varies: 50 to 150 feet. Antenna will extend range
Types of Personal Radio Systems

Body worn
Integrated
- receiver built into the instrument

Dedicated
- Receiver designed only for use with specific hearing aid model

Universal
- Receiver that can be used with products from other manufacturers

Sound field or TADS
- Receiver in box placed on desk
Body Worn Receivers

• Non-Fittable: No internal controls except gain for environmental mic vs. FM mic

• Output transducer
  • Personal hearing aid
    • Direct audio input
    • Neckloop/silhouette
  • No hearing aid
    • Earbud, headphone

• Hearing aid must have appropriate coupling capabilities & switch options
Body Worn Receiver Options

- Receiver with built-in induction neckloop
- Use with telecoil in cochlear implant and/or hearing aid
- Permits binaural use if a cochlear implant is used in one ear and a hearing aid in the other ear
- User adjustable volume control
- Output jack for headphone
Dedicated Receivers

- Incorporates the hearing aid/cochlear implant with the FM system
- Dedicated (receiver is compatible with one case design)
- Hearing aid requires a specific receiver model
  - If client changes hearing aid model a new dedicated FM receiver is also needed
Universal Receivers

• Miniature universal receiver that will work with any behind-the-ear hearing aid or cochlear implant that permits direct audio input

• Plugs into hearing aid audio shoe with universal plug

• Audio shoe is specific to the hearing aid model; however, this universal FM receiver is not
Universal Receiver Advantages

• Advantages:
  • If the user gets a new hearing aid or implant processor the SAME universal FM receiver can be used
  • All that is needed is a new audio shoe
  • Best option for school districts
Transmitter Styles

HANDHELD/LAVALIER TRANSMITTER

TRADITIONAL BOX STYLE
Transmitter Microphone Options

Location defined by how the mic is positioned on the teacher

External mic
  ◦ Lapel mic
  ◦ Cheek mic (ATC)
  ◦ Head or neck boom (HB)

Internal mic
  ◦ Built-in mic(s)

HB and ATC provide the closest and most consistent positioning to the speaker’s mouth
Transmitter Mic Location

• Group conversations with multiple speakers
  • Can pass around mic
  • Use conference microphones
  • Multitalker network
    • Comfort Audio
    • Phonak Roger system

• Best to connect to existing PA system if one exists
FM and 2.4 GHz Systems

ADVANTAGES

- Most flexible technology—useful in variety of situations
- Can connect to any sound source
- No line of sight restrictions
- Ease of installation/ease of use
- Portability—uses batteries, can use outdoors or indoors
- No seating restrictions
- Appropriate for mild to profound hearing loss
- No fluctuation in signal strength
- Unlike BT and other wireless digital technologies there is no transmission delay

DISADVANTAGES

- Potential for outside radio/TV FM interference
- Privacy
- High initial purchase price
- Transmitter & receiver must match frequency and bandwidth
- An FM receiver is needed for each listener
The HOW....

ALERTING & SIGNALING DEVICES
Alerting Devices

Alerting/signaling devices assist with the awareness and identification of environmental sounds and situations. These devices convert the signal into a visual or vibrotactile signal or make it otherwise easier to hear.
Awareness Of Environmental Sounds & Situations

• Goals:
  • Provide an alternative method of being alerted to environmental sounds
  • ADA accommodation/equal communication access
Alerting Devices

Needed

- When distance, background noise, and architectural barriers make it difficult to detect warning signals
- When signals are very soft and difficult to hear
- Signals cannot be heard due to hearing loss
- When hearing aid or cochlear implant is connected to a sound source (TV/music)
Types of Alerting Devices

Person-to-person signaling devices
  Examples: Pagers, baby cry monitor

Environment-to-person signaling devices
  Examples: telephone and doorbell, fire alarm, alarm clock
Alerting Devices: Device-to-Person

- Telephone/TTY alerts
- Doorbell/door knock
- Smoke/fire
- Weather alerts
- Wake-up alarms
- Timers
- Call waiting/computer prompts
- Police, ambulance sirens
- Security alarm
Types of Alerting Stimuli

Visual
   Flashing light/strobe

Auditory
   Adjust volume
   Adjust pitch
   Remote receivers to bring sound closer

Vibrotactile
   Body worn waist or wrist vibrators
   Pillow vibrators

ANY combination of the above
Telephone Ring Signalers

Ring signalers for existing phones

Make phone ring heard easier by through adjustment of

  - Volume
  - Pitch
  - Remote signaling by bringing sound closer

Options exist for visual and vibrotactile signaling of the telephone ring
Doorbell Signalers

Wired and wireless models

Signal doorbell using auditory, visual, or vibrotactile alerts

Visual signalers have a built-in outlet for a lamp/strobe

Some will work with the existing doorbell and others use a separate button

Some models transmit to remote receivers while more basic models do not
Wake-up Alarms

Wake-up person using
Visual (lamp/strobe)
Vibrotactile (bed shaker)
Auditory
  Louder alarm
  Adjustable pitch

Most signal with only one type of alert others use all 3

Standard and travel size models

Some clocks double as a remote receiver for other alerting transmitters
Alerting Systems

Use combinations of transmitters and receivers to alert individuals to incoming auditory signals.

1 transmitter required for each auditory signal that you wish to alert.
Wireless Alerting Systems

May use multiple receivers to provide signaling throughout a building

One receiver will work with multiple transmitters

Identification of sound source is made by

  Different flashing rates

  Illuminated lights that indicate door/phone/wake-up, etc.
Receiver options

Can receive inputs from multiple transmitters

Styles
- Wall mount with outlet for lamp/strobe or built-in strobe
- Desk models with built-in strobe or outlet for lamp or built-in indicator lights

Signal options
- Auditory
- Visual
  - Override switch
- Vibrotactile
Body Worn Receiver options

Body worn tactile receivers with built-in indicator lights
Worn on the wrist or waistband
Vibratory alert for the user
Visual signals indicate the source of the sound
Multi-function Devices/Systems

Single function devices signal only 1 type of sound source such as the phone or doorbell.

Multi-function devices are capable of signaling two or more sound sources.

  Multiple devices in one unit

Use if more than 1 or 2 alerting needs

Clarity Alertmaster System
The HOW....

TELECOMMUNICATION DEVICES
Telecommunication Devices

There are a variety of hearing assistive devices for use with the phone.

For people who understand fairly well on the phone but just need more volume, **auditory devices** will help:

- Amplified telephones
- Cordless amplified phones
- Replacement handsets
- In-line amplifiers
- Amplified headsets

For people who hear but have difficulty understanding speech on the phone, non-auditory devices can provide captions to supplement hearing:

- Captioned phones and services
Amplified Landline Phones

Corded vs. cordless
Usually for residential use only

Degree of amplification varies
20-55 dB

Features vary among products
Adjustable volume and/or tone
Adjustable ringer loudness/pitch
Audio output to connect neckloop/DAI
Visual signal indicators
Call waiting
Caller ID
Memory dial buttons
Built-in answering machine
Speakerphone
Bluetooth-enabled

Clarity Professional XLC3.4
Fanstel ST250 Amplified Home Office Phone
Geemarc AmpliPOWER60
Clarity Fortissimo Remote Controlled Speakerphone
Auxiliary Amplifiers

Connect amplifier to existing phone

- In-line amplifiers
- Portable amplifiers

Vary in power source

- Batteries
- AC adapter
- Line powered
In-line amplifiers

Connects between the base of the phone and the handset of the phone

Telephone’s signal processing must occur prior to the amplification provided by the auxiliary amplifier

Will **NOT** work with cordless or phones with the dial pad in the handset of the phone
Linking the Phone to the Hearing Aid/CI

TELECOIL-ENABLED AND BLUETOOTH ACCESSORIES
Telecoil-enabled Accessories

Electrical signal from audio device is passed through the neckloop or silhouette transducers which convert the electrical signal into an fluctuating electromagnetic signal to be picked up by the telecoil.

Microphone-equipped accessories permit hands-free phone use.

Allows for binaural use
- Bilateral hearing aids
- Cochlear implant and hearing aid
- Bilateral cochlear implants

Connect to any audio source with a headset jack
- Cell phones
- Corded and cordless phones
- MP3 player
- Tablet
- PC

Wireless telecoil-enabled accessories use Bluetooth to connect cable free to a BT-enabled audio source.
Induction Neckloops

Will work with landline and cell phones and any audio source

In-line microphone

2.5 mm or 3.5 mm jack plugs directly into the headset jack on the phone

Bluetooth induction neckloops also available

ClearSounds Amplified Power Neckloop CLA7v2

Geemarc TLoop Powered Neckloop with Microphone

ClearSounds Quattro 4.0 Adaptive BT System
Induction Neckloop “Headset”

ClearSounds Amplified Power Neckloop CLA7v2 with Plantronics M22 in-line amplifier and ClearSounds 3.5mm to RJ9 Connection Cord

ClearSounds Professional Office Neckloop System with IL95 Clearsounds in-line amplifier and handset splitter
Induction Silhouettes

Sit behind the ear between the HA/CI and the head

Monaural and binaural configurations

Yields a stronger signal than a neckloop due to the proximity to the telecoil

2.5 mm/3.5 mm silhouette jack plugs directly into the headset jack on the phone/cell phone

In-line mic permits hands-free use
What is Bluetooth?
What is Bluetooth?

Radio-based technology that permits short-range wireless mobility

Allows Bluetooth-enabled devices to communicate and transfer information wirelessly through personal area networks

Designed to be a Cable Replacement Technology:

Bluetooth requires no *physical* connection between Bluetooth-enabled devices and Bluetooth transceiver
Wireless Connections

Many hearing aids and cochlear implants have the option to link wirelessly to Bluetooth-enabled devices.

Typically requires the use of a Bluetooth gateway device:
- Many are proprietary to the hearing aid manufacturer.
- Non-proprietary (universal) options exist that communicate to HA/CI via the telecoil.

Options include:
- Oticon Streamer Pro
- Phonak ComPilot
- Clarity CE50 HearIT BT Neckloop
- Clearsounds Quattro BT Amplified Neckloop
Landline Phones

Phones with built-in BT
- AT&T has several models
- ClearSound iConnect A6BT Amplified Phone
- Plantronics Calisto P835 Speakerphone
Linking to Landline Phones

BT adapters
- Plantronics PL-MDABDL (BoostEar)
- ClearSounds QH2 BT Hub and Phone Amplifier
- Work with analog or digital phones and/or computer
- Pair with Gateway device
The HOW....

CAPTIONED PHONES AND CAPTIONING SERVICES
TTY/TDD (Text telephone)

Text-to-text telephoning

Device that receives and transmits text via standard telephone lines

Operates on “baudot code” a sound-based coding system that converts text into audible beeps that are transmitted over the phone line

Options to send the text via the phone line

Acoustic coupling
TTYs

Direct communication requires the use of a TTY by each user.

If one party doesn’t have a TTY, callers must use the relay service.

- FREE service: cost is covered by the Telecommunications Relay Service (TRS) funds as part of Title IV of the Americans with Disabilities Act (ADA).
Relay Services Available

Traditional Telecommunication Relay service (TRS)
- TTY to hearing person and vice versa using standard telephone lines
- Accessed by dialing 7-1-1 which is the national number for relay service
- 3rd party Communication Assistants (CAs)
  - Converts message from non-TTY user to text for the TTY user
  - Verbalizes message from TTY user to non-TTY user
Relay Services Available

Voice Carry Over (VCO)

• Allows a person to use his/her own voice on the telephone and to read the other person’s response
• Used by HOH or deaf/late deafened persons who have clear, understandable speech
Hearing Carry Over (HCO)

- Allows users to carry on a conversation between a hard of hearing person who can hear on the phone but prefers to not use their voice and a hearing person over the phone
- Used by persons with speech or voice impediments
Internet and video relay services

• In 2000, internet and video relay were added as available relay services. Similar to TRS, except the text portion is conducted over the internet.

• With VRS, an interpreter uses ASL and spoken language that is relayed over the internet.
Video Relay Service (VRS)

Enables an individual who uses ASL to communicate via videoconferencing with a certified Video Interpreter (VI) through the internet.

VI voices/relays the signed conversation over the phone in real time to the hearing caller.

Source: www.csc.edu
Internet or Web Relay

• No need for a TTY

• All relay calls are made using the computer, Smartphone, netbook, or tablet and the internet and a relay service

• Free service (e.g. Hamiltonrelay.com, i711, IP-Relay)

• Can set up a locally-based phone number rather than requiring caller to dial an 800-number and then requesting that the service call the person’s number

• Internet relay is strictly text; there is not an option for either person to hear each other
Captioned Phone Options
Combination of Auditory & Non-Auditory
CapTel (Captioned Telephone)

• CapTel is special captioned VCO phone that allows the caller to read the conversation while using the telephone
• Still requires use of a relay service but uses voice-recognition technology
• Slight delay in the captions
Web CapTel

Computer captioning; requires high-speed internet

FREE web-based service provides word-for-word captions of a phone call on a web browser during the call

Can use with landline or cell phone

Can send the text to a PC or Mac or CISCO IP phone

Several service providers available
  ◦ www.sprintcaptel.com
  ◦ www.hamiltoncaptel.com
  ◦ www.clearcaptions.com
Captioning On-The-Go

Several options are available to receive phone captions on a smartphone mobile device; free apps

Requires 3G network service or WiFi connection that supports *simultaneous* voice and data transmission or 4G networks
Captioning On-The-Go

- www.sprint800.com
  - Android app for Android 2.2 or higher smartphone; iOS devices
- www.clearcaptions.com
  - iPhone, iPad, Android
- www.hamiltoncaptel.com/mobile
  - Android, iPhone
  - English or Spanish captions
- www.i711.com
  - Blackberry
- www.ip-relay.com
  - Android™, iPhone
InnoCaption

Only mobile phone app provide that uses live stenographers for captioning

Faster with greater accuracy (95%)

iPhone
- Requires iPhone operating system 6.0 or higher

Android
- Requires Android operating system 2.3 or higher
Captioning On-The-Go

Use with wired or wireless accessories to route audio signal to HA/CI

- Bluetooth gateway devices
- Induction neckloop
- Induction silhouette
- Direct Audio Input
VISUAL (CAPTIONING) SYSTEMS

Real time captioning (C.A.R.T.)
- Verbatim captioning, using court stenographer and specialized computer hardware/software to type proceedings word-for-word
- Lectures, TV broadcasts
- Purchase service from a captioning vendor

Source: www.captionfirst.com
CART Options

Live CART: operator present in person in classroom providing CART

Remote CART: (CART operator off-site)

Remote Conference Captioning (RCC) for multiparty teleconference calls

Source: www.captionfirst.com
Interpretype or ITY

Communication system that offers

1. Text messaging between devices

2. Streaming video and internet telephone connections allow remote video captioned interpreters and translators

Communication can be face-to-face or at a distance

ITY can be used with WiFi, Ethernet, Bluetooth, or USB to USB for different levels of privacy and transmission range

www.interpretype.com
Ubi Duo Face-to-Face Communicator

Wired or wireless communication device by sComm

Facilitates face-to-face communication between deaf/HOH and hearing people

Wireless model has a range of up to 300 feet

7 inch color touch screen

8-hour battery life

www.scomm.com
Dragon Dictation

Voice-to-text app that recognizes and transcribes spoken words to text

Works with iPad, iPhone, etc.

Has multiple languages available including Spanish

Does NOT translate from one language to another
The HOW....

CONNECTING TO MULTIMEDIA
Hardwired Connection

Individuals who wear hearing aids and cochlear implants may not be able to use headphones to access the audio from computers, tablets, TVs, etc.

Hardwired—direct connection direct to the audio device

- Via telecoil
  - Induction neckloop
  - Induction silhouette
- Direct auditory input
  - Requires an audio boot specific to hearing aid
Hardwired Connection

Hardwired connection between FM transmitter or Bluetooth gateway device and the audio device

Wireless transmission to the student’s FM receiver or hearing aids
Wireless Connection

Bluetooth-enabled devices
- mP3 players, tablets, laptop, etc.

BT wireless connection
- Pair and connect BT gateway to 3rd party BT devices

Non BT-enabled device?
- Attach a BT transmitter/adapter

Clearsounds QLink
Computer connections

Hardwired: plug gateway device or FM transmitter to computer via audio output jack

Wireless: BT built into laptop or PC paired to gateway device

If not A2DP supported
- Sennheiser BTD500 USB BT dongle
- Kensington BT USB dongle
Just because you have devices that each have Bluetooth does NOT mean they will work together to accomplish the same goal.
Bluetooth Profiles

**Bluetooth Application Profiles** – to use Bluetooth technology, a device must be able to interpret certain Bluetooth protocols or rules; the profiles define the possible applications

Think of profiles as capabilities or features

BT Device used must support the appropriate Bluetooth profile of the Bluetooth transreceiver

- Profiles indicate the range of applications of a device
- At least 33 different profiles exist
Bluetooth Application Profiles To Look For

**HSP Headset Profile (most common)**
- Provides support for BT headsets to be used with cell phones
- Allows the ability to ring, adjust the volume, answer a call and hang up

**HFP Hands-free Profile**
- Commonly used to allow communication with a car hands-free system
- The extra features that HFP allows are last number redial, call waiting, and voice dialing

Most BT headsets support both HSP and HFP profiles
Bluetooth Application Profiles To Look For

A2DP Advanced Audio Distribution Profile

◦ High-end audio profile with broader bandwidth and stereo capabilities
◦ Defines how high quality audio (stereo or mono) information can be streamed from one device to another
◦ Examples:
  ◦ Music from mobile phone to a car audio system or a wireless headset
  ◦ Music from an MP3 player to a wireless headset
  ◦ Audio from a TV/stereo, computer to a wireless headset