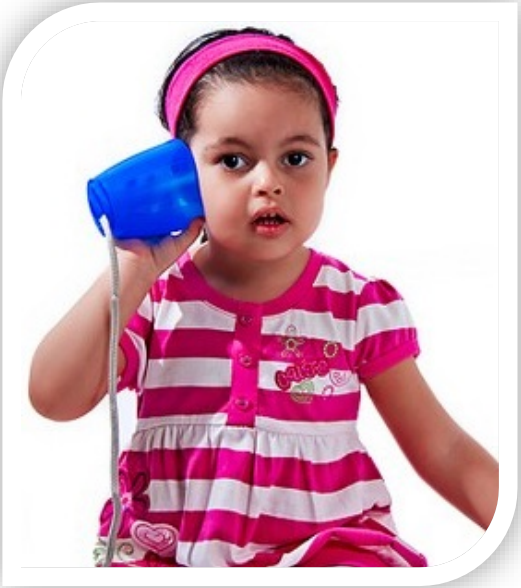
Find the Right Channel: Communication Aids for People who are Deaf or Hard of Hearing



Communication comes in many shapes and sizes: a multi-paged report, a hastily scratched memo on a post-it, a whisper, a shout, a shrug of the shoulder, or a smile. Whether transacted through speech, written text, body language, or facial expressions, we rely on these and other channels of communication to convey information, impart knowledge, voice opinions, express our moods, and interact with other people.

But what if you cannot hear or have difficulty hearing? Does that mean you have to limit your method of communication to paper and pen? By no means! A diverse array of assistive technology (AT) products are available to help you bridge the communication gap. From telephones to computers to other wearable devices, this guide will present a few of the AT products designed to help you communicate effectively; interact with others seamlessly; and live a more independent and productive life.

Telephones

Robert H. Weitbrecht was a physicist with the Stanford Research Institute and a licensed amateur radio operator; James C. Marsters was a prominent orthodontist and licensed pilot; and Andrew Saks was an electrical engineer and the grandson of the founder of Saks Fifth Avenue (a department store in New York City). These three men, each of whom was deaf, were the first to break the telecommunication barrier for the deaf community.

In 1964, 88 years after Alexander Graham Bell invented the telephone, Weitbrecht, Marsters, and Saks transformed a “teletype machine” into a device that could relay a

typewritten conversation through a telephone line. It was the first example of what became commonly known as a teletypewriter (TTY). Most TTY units consist of a keyboard, a display screen, and a screen. When a "sender" types a message on his or her keyboard, it is transmitted though his or her modem to the "receiver's" modem and appears on the receiver's display screen.

TTY units made it possible for the deaf, hard of hearing, and speech-impaired community to communicate independently for the first time via the telephone line. The only drawback was that both parties had to have TTY units. To solve this dilemma, the Telecommunications Relay Service (TRS) came into play.

The TRS service was first introduced as a volunteer program with limited hours and locations of operation. That all changed in 1990 when Title IV of the Americans with Disabilities Act (ADA) mandated relay services be available in every state and territory on a 24-hour, seven days per week basis.

TRS has operators, known as communication assistants (CAs), who coordinate communication between people who use TTY units with those who do not by converting messages from text-to-voice and voice-to-text between the two parties. Specifically, here's how it would work for you if you use a TTY unit:

- You would contact your state's TRS relay center using your TTY unit and give the CA the number of the person you want to reach.
- The CA would make a traditional outbound call to that person, and then serve as a liaison between you and him or her.
- The CA would verbalize your typed message (text-to-voice) to the person, convert what he or she says into text (voice-to-text), and send it to your TTY unit so you can read it off its screen.

Anyone – those who have a hearing or speech disability and those who do not – can initiate a TRS call by dialing 711 from a telephone or TTY unit. The 711 dialing feature, which is regulated by the Federal Communications Commission (FCC), enables you to reach TRS or any other non-Internet-based relay service nationwide. The benefit of this is you do not have to memorize the TRS number for each state. To learn more about the FCC and the various types of TRS they provide, please see the FCC's consumer guide.

The Ultratec's Superprint 4425™ is one example of a TTY unit. It provides notifications on its screen if another TTY unit you are calling is ringing or busy; a programmable auto-answer feature to take messages for you when you are unavailable; a built-in 24-character printer with three selectable print sizes; 32k memory for storing memos, conversations, and telephone numbers; function keys for sending and editing memos; a one-touch Greeting key; a sticky key feature for single-handed typing; and advanced calling features, such as auto-busy redial and three-way calling.

Captioned telephones (CapTel) are designed as an alternative to TTY to speed communications. If you are hard of hearing or deaf, but can speak, a CapTel unit may be a good option for you. You still need to use a relay service, but a CapTel unit allows you to speak directly to another party and have what he or she speaks back to you appear on its screen.

The CapTel 2400i is one example of a CapTel unit. With the CapTel 2400i, you can save up to 100 contacts; be alerted to incoming calls and new answering machine messages with the aid of a ring flasher; read captions of answering machine messages and conversations from previous phone calls; adjust caption font size (5-13.5 millimeters), the volume (up to 40 decibel), and frequency levels of incoming sounds; turn captions on or off; and automatically connect to a help line by pressing the CUST SERV Button.

Computer Operating System Accessibility Aids

Computers and the internet have granted us access to many new communication channels. Whether it is through e-mails, blogs, Facebook messages, Tweets, or other posts, we can travel through this virtual realm using multiple mediums to connect and communicate with other people.

Windows and Macintosh had accessibility in mind when they incorporated built-in operating system features for people who are deaf or hard of hearing. One major feature is visual alternatives for audio sounds. You can learn how to receive audio notifications as text or visual cues on the Windows and Macintosh accessibility pages.

Mobile Apps

Mobile apps have revolutionized the way we communicate. When it comes to retrieving and sharing information, mobile apps have upped the ante in terms of speed, convenience, portability, and availability. Below is a sampling of apps that can help you if you are deaf or hard of hearing communicate with others who are not. These apps provide alternate channels of communication that are available to you right at your fingertips.

Braci – This Android and iPhone app listens to the environmental sounds around you (e.g., smoke alarms, doorbells, telephone rings) and turns them into visual and sensory alerts, including vibrations, flashing lights, icon images, and text notifications.
Eye-Sign – This Android app translates text or spoken words, through voice recognition software, into sign language and displays them as a series of video clips. Eye-Sign is now available with both British Sign Language and American Sign Language dictionaries.
Live Caption – Using voice recognition software, this iPhone and Android app turns a mobile device into a live captioning device by transcribing everything a person says when speaking with you through a call into text you can read in real-time.

Pedius – This Android and iPhone text messaging app allows you to have real-time conversations without a communication assistant. Type or speak your message into your mobile device and Pedius will send it to one of your contacts using either your own voice or an automated voice through speech synthesis. Then, using voice recognition software, Pedius will translate your contact's verbal response into written text so that you can read it on your screen in real-time.
Subtitles Viewer – Use this iPhone app to download subtitles for TV shows or movies and display them on your device while watching on your TV or at the movie theater.
TV Louder – This iPhone app allows you to increase your TV's sound without turning the volume all the way up. Just set your TV to a standard listening volume, select the preferred volume level on your mobile device, and then listen to the amplified sound through headphones or earbuds.
VoxSci – Using a conversion engine called **V**irtual **E**ngine for **R**ecognition of **B**asic **S**peech (VERBS), this Android and iPhone app converts voice messages to text and delivers them to you either in e-mails or as text messages on your mobile device.

Specialized Devices

In addition to telephones, computer operating systems, and mobile apps, there are many specialized devices available on the market to assist you in communicating with others if you are deaf or hard of hearing. Below are a few examples to give you a sense of the types of specialized devices on the market.

Type and Communicate: UbiDuo 2 Wireless

The UbiDuo 2 Wireless is a portable, stand-alone communication device that allows you to have face-to-face communications with someone who is deaf or hard of hearing without an interpreter. It consists of two communication units, each of comprised of a keyboard and a seven-inch diagonal color touch screen. You and the person you are communicating with will each use a half to type down your messages on your keyboard and read the other person's response on your screen. Through its split screen interface, you can converse seamlessly with the other person face-to-face in real-time through the UbiDuo 2 Wireless.

The Standard Wireless model of the UbiDuo connects the units with a built-in proprietary networking protocol that has a range of up to 300 feet. And because of its unique patented hinge technology, you can also interlock the two units together for expedient transport and storage. Weighing a total of four pounds, the UbiDuo 2 features an eight-hour lithium-polymer battery pack; 128MB of total storage; a micro USB port for charging; customizable text, fonts (12-72 point), and background colors; and password protection on saved conversations and configuration settings (SComm).

Sign and Communicate: SignLanguageGlove

Sign language is an effective mode of communication, but like all languages, its effectiveness is limited exclusively to those who know and understand it. Hadeel Ayoub,

a student from Goldsmiths, University of London, sought to bridge this communication gap through her invention, the SignLanguageGlove.

The SignLanguageGlove, a prototype that is not yet commercially available, is a wireless device that translates sign language gestures into visual letters or speech via a smartphone app or tablet device. Currently in its fourth prototyping stage, the SignLanguageGlove is equipped with an accelerometer and five flex sensors that detect how you bend and twist your fingers while keeping track of how you orientate your hand as you sign. A computer program then translates these hand gestures into words and displays them as visual letters on the screen. In her latest prototype, Ayoub incorporated a text-to-speech chip into the glove's lining - hardware that can translate what you communicate via sign language into spoken language.

Ayoub is working on incorporating several new features into the latest version of the SignLanguageGlove, including Wi-Fi for sending texts and e-mails, a translation feature for real-time translation in multiple languages, and improved motion sensors for improved accuracy in translating sign language gestures. She also plans to develop a smaller version of the SignLanguageGlove for children.

Read and Communicate: STW-C140GI Entertainment Access Glasses with Audio

Sony has developed STW-C140GI Entertainment Access Glasses with Audio, a wearable captioning device in the shape of eyeglasses that utilizes holographic technology to deliver movie captions in real-time. When you put on this lightweight, see-through eyewear, you will see closed caption text overlaid on the cinema screen, which you can read as you watch the movie, regardless of where you are seated in the movie theater. These Entertainment Access Glasses work in combination with a STW-C140X receiver box and a STWA-C101 data transmitter. The data transmitter is not intended for consumer purchase. The theater must have a data transmitter in order for your glasses to work. This technology is still relatively new. Although more and more theaters have the data transmitters, many still do not. So, contact a particular theater prior to going to make sure they have a STWA-C101 data transmitter.

So how does it work? The receiver box, which comes with the captioning glasses, receives closed caption data wirelessly from the data transmitter in the theater. The receiver box then transmits the data to the captioning glasses via a radio frequency and utilizes holographic technology to display the captions through the glasses, which measures 1.75 x 7.5 x 7.5 inches (HxWxD) and weighs 3.0 ounces. The end result: you see a display of clear subtitles (31 characters by three lines) in green text through your glasses on the cinema screen for your viewing eyes only.

The receiver box is also equipped with an audio assist function specifically for those who are hard of hearing. You can plug any supported headphones into the receiver box and

amp up the volume to your preferred level, sit back, and enjoy the show. Note: The receiver box outputs only to one device at a time, either to the captioning glasses or headphones. The box has a battery life of six hours and measures 1.81 x 4.38 x 0.81 inches (HxWxD) and weighs 3.1 ounces.

For More Information

This guide has introduced you to some communication aids that you may find useful. Visit AbleData to learn more about these and the many other communication devices and accessories that are available for you if you are deaf or hard of hearing.

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This publication was written and produced by AbleData. AbleData is funded by the National Institute on Disability and Rehabilitation Research (NIDRR) of the U.S. Department of Health and Human Services (HHS) under contract number ED-OSE-13-C-0064 and operated by New Editions Consulting, Inc.

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