



Use of Telecommunications Products by People with Disabilities

Ensuring access to everyone

It is estimated that more than fifty million Americans have disabilities. Despite their large numbers, people with disabilities continue to face challenges in accessing the full range of opportunities available to people without disabilities. Specifically, barriers to standard electronic and information technology limit opportunities to education and employment for some people with disabilities. This includes telecommunications equipment and services.

Telecommunications products have become essential tools in education, employment, and recreation. Today, almost all Americans use telecommunications products for routine daily activities. For example, telephones are used for making dentist appointments and airline reservations, ordering take-out food, calling relatives, communicating with customers and colleagues, participating in conference calls at work or in school, and making emergency telephone calls to 911 services. In addition, a wide range of specialized telecommunications tools such as those used for distance learning, telecommuting, and videoconferencing enable Americans to connect with one another from almost anywhere and at anytime.

Some individuals face challenges in accessing standard telecommunications equipment. For example, a person who is hard of hearing might require amplification to hear people speaking on a telephone; someone who is deaf cannot hear them at all. An individual who cannot speak cannot participate in voice communication, unless alternatives are provided. Someone who is blind cannot access the visual content of a videoconferencing class. And, an individual with limited hand function cannot press the keys on a standard telephone system.

Legal Issues

Congress has responded to the need to increase access to products and services for people with disabilities by passing legislation in a range of areas, including education, employment, transportation,

assistive technology, and electronic and information technologies. Some guarantee the civil rights of individuals with disabilities; others establish procurement requirements for specific agencies; still others impose accessibility requirements on manufacturers of products and providers of services. Some legislation is at the federal level and some is at the state level. Some focus on disability-related access issues specifically; other legislation includes access issues as part of broader applications. Relevant federal laws include, but are not limited to, the Rehabilitation Act of 1973, Section 508 of the Rehabilitation Act, the Telecommunications Accessibility Enhancement Act of 1988, the Hearing Aid Compatibility Act of 1988, the Television Decoder Circuitry Act of 1990, the Americans with Disabilities Act (ADA) of 1990 and 2008 amendments, the Telecommunications Act of 1996, the Individuals with Disabilities Education Act (IDEA) of 1997, and the Assistive Technology Act of 1998. This publication summarizes the provisions of several key pieces of legislation that relate to accessible telecommunications products and services—Section 504 of the Rehabilitation Act, the Americans with Disabilities Act, the Telecommunications Act, and Section 508 of the Rehabilitation Act.

Section 504 of the Rehabilitation Act of 1973 requires that programs and services that receive federal funding make those options available to individuals with disabilities, providing reasonable accommodations as necessary. The **Americans with Disabilities Act of 1990 (ADA)** is civil rights legislation that builds on and extends the reach of Section 504. It requires that public programs and services be accessible to people with disabilities and that they provide accessible, “effective communication,” regardless of what medium is typically used for that communication. For example, if an Internet-based distance learning course is offered to the public, then this opportunity must be made accessible to qualified students who have disabilities. The ADA also covers issues related to nondiscrimination on the basis of disability in employment decisions and



requires that employers provide reasonable accommodations, that may involve access to technology. Title IV of the ADA mandates a nationwide system of telecommunications relay services (TRS), which makes it possible for standard voice telephone users to talk to people who have difficulty hearing or speaking on a telephone. With this system, a person who is deaf can use a text telephone device (TTY) to call a voice telephone user through a TRS provider; a communications assistant places the call to the voice user and relays the conversation by transcribing spoken content for the TTY user and reading text aloud for the voice user. The federal Communication Commission (FCC) enforces the rules under this title of the ADA.

The **Telecommunications Act** of 1996 is designed to promote the accessibility of telecommunications equipment and services to individuals who have been underserved. For the purposes of this legislation, “telecommunications” is defined as the transmission, between or among points specified by the user, of information of the user’s choosing, without change in the form or content of the information as sent and received. “Telecommunications equipment” is defined as equipment, other than customer premises equipment, used by a carrier to provide telecommunications services. “Customer premises equipment” is equipment employed on the premises of a person (other than a carrier) to originate, route, or terminate telecommunications. A “telecommunications service” is the offering of telecommunications for a fee directly to the public, or to such classes of users as to be effectively available directly to the public.

Two provisions of the Telecommunications Act focus specifically on access to telecommunications products by individuals with disabilities. **Section 713** of the **Telecommunications Act** aims to ensure that video programming and services are accessible to individuals with disabilities and promotes the use of captioning and audio description. Section 713 requires that the FCC study 1) the level at which video programming is closed captioned and then establish a timetable for closed captioning requirements and 2) the use of video description in order to assure the accessibility of this service to people with visual impairments.

Section 255 of the **Telecommunications Act** requires that manufacturers of telecommunications and customer premises equipment and providers of telecommunications services ensure that such equipment and services are accessible to people with disabilities, if readily achievable. “Readily achievable” means easily accomplishable and able to be carried out without much difficulty or expense. When it is not readily achievable to make telecommunications equipment accessible, the Act requires that manufacturers ensure that the equipment is compatible with existing peripheral devices commonly used by individuals who have disabilities to achieve access (i.e., assistive technology), if readily achievable. As mandated by the Telecommunications Act, the Architectural and Transportation Barriers Compliance Board (Access Board), in conjunction with the FCC, developed guidelines for accessibility, usability, and compatibility of telecommunications equipment covered by Section 255. The guidelines address the access needs of individuals with disabilities that affect hearing, vision, mobility, speech, and cognitive skills.

In 1986, **Section 508** was added as an amendment to the **Rehabilitation Act** of 1973. Section 508 was amended in 1998 as part of the Workforce Investment Act. Section 508 requires that when federal agencies develop, procure, maintain, or use electronic and information technology, they ensure that federal employees with disabilities have access to and use of information and data that is comparable to that of federal employees who do not have disabilities, unless doing so would impose an undue burden on the agency. Section 508 also requires that members of the public with disabilities who seek information or services from a federal agency, have access to and use of information and data that is comparable to that provided to members of the public who do not have disabilities.

As required by Section 508, the Access Board developed technical and functional performance criteria necessary for electronic and information technology to comply with Section 508. The accessibility standards for procurement of telecommunications products are:



1. Telecommunications products or systems which provide a function allowing voice communication and which do not themselves provide a TTY functionality shall provide a standard non-acoustic connection point for TTYs. Microphones shall be capable of being turned on and off to allow the user to intermix speech with TTY use.
2. Telecommunications products which include voice communication functionality shall support all commonly used cross-manufacturer non-proprietary standard TTY signal protocols.
3. Voice mail, auto-attendant, and interactive voice response telecommunications systems shall be usable by TTY users with their TTYs.
4. Voice mail, messaging, auto-attendant, and interactive voice response telecommunications systems that require a response from a user within a time interval, shall give an alert when the time interval is about to run out, and shall provide sufficient time for the user to indicate more time is required.
5. Where provided, caller identification and similar telecommunications functions shall also be available for users of TTYs, and for users who cannot see displays.
6. For transmitted voice signals, telecommunications products shall provide a gain adjustable up to a minimum of 20 dB. For incremental volume control, at least one intermediate step of 12 dB of gain shall be provided.
7. If the telecommunications product allows a user to adjust the receive volume, a function shall be provided to automatically reset the volume to the default level after every use.
8. Where a telecommunications product delivers output by an audio transducer which is normally held up to the ear, a means for effective magnetic wireless coupling to hearing technologies shall be provided.
9. Interference to hearing technologies (including hearing aids, cochlear implants, and assistive listening devices) shall be reduced to the lowest possible level that allows a user of hearing technologies to utilize the telecommunications product.
10. Products that transmit or conduct information or communication, shall pass through cross-manufacturer, non-proprietary, industry-standard codes, translation protocols, formats or other information necessary to provide the information or communication in a usable format. Technologies which use encoding, signal compression, format transformation, or similar techniques shall not remove information needed for access or shall restore it upon delivery.
11. Products which have mechanically operated controls or keys, shall comply with the following:
 - a. Controls and keys shall be tactilely discernible without activating the controls or keys.
 - b. Controls and keys shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force required to activate controls and keys shall be 5 lbs. (22.2 N) maximum.
 - c. If key repeat is supported, the delay before repeat shall be adjustable to at least 2 seconds. Key repeat rate shall be adjustable to 2 seconds per character.
 - d. The status of all locking or toggle controls or keys shall be visually discernible, and discernible either through touch or sound.

Although these standards apply to the procurement and use of telecommunications products by federal agencies, they provide a model of accessibility that has been adopted by other organizations as they create policies to meet their obligations under the ADA. In addition, states who accept funds under the Assistive Technology Act are required to provide an assurance of compliance with Section 508.

Benefits to Everyone

Recent legislation, public awareness, and technology advancements have served to make telecommunications accessible to increasing members of individuals with disabilities. Today, people who cannot use telephones with their voices have access to a nationwide TRS; those who prefer sign language interpretation can communicate remotely using a new video relay service; telephones are hearing aid compatible; digital wireless text communications options exist; and efforts are being made to remove accessibility barriers to cell phones.



When telecommunications products are designed to be accessible to individuals with a broad range of disabilities, they become more useful to everyone. For example, speaker phones are useful to individuals who cannot use their hands because of a mobility impairment, but they are also useful to people who want to listen to and participate in a phone conversation as a group or use their hands for a purpose other than holding the receiver. A vibrator option of a pager or cell phone can be useful for people who do not want to interrupt coworkers or classmates. It is hoped that including accessibility considerations in the design of telecommunications products will create a more accessible world for everyone.

Additional Resources

For the most recent version of this publication, visit www.uw.edu/doi/Brochures/Technology/telcom.html.

For the comprehensive website, **Designing More Usable Telecommunications**, a joint project between Gallaudet University and the Trace Center, consult trace.wisc.edu/world/telecomm/.

For information on the Americans with Disabilities Act consult the Department of Justice ADA home page at www.ada.gov. For information from the FCC on Title IV of the ADA, consult www.fcc.gov/cgb/dro/title4.html.

For information about **Sections 255 and 713 of the Telecommunications Act** provided by the FCC, consult www.fcc.gov/cib/dro/dtftele.html.

For the Access Board's **Telecommunications Act Accessibility Guidelines** (for Section 255), consult www.access-board.gov/telecomm/rule.htm.

For the Access Board's standards for implementing **Section 508 of the Rehabilitation Act**, consult www.access-board.gov/sec508/standards.htm.

About DO-IT

DO-IT (Disabilities, Opportunities, Internetworking, and Technology) serves to increase the successful participation of individuals with disabilities in challenging academic programs and careers. Primary funding for DO-IT program is provided by the National Science Foundation, the U.S. Department of Education, and the State of Washington.

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