

Checklists for Making Library Automation Accessible to Patrons with Disabilities

Version 2.0

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INTRODUCTION

Librarians are likely continuing to find themselves serving a significant number of patrons with disabilities. This is due to a number of factors, among them the increased participation of disabled persons in society, the aging “baby boom” generation, and even the increasing number of people injured from excessive or improper computer use.

To comply with federal legislation mandating equity of access¹ to public resources for disabled and non-disabled persons, and to ensure that patrons with disabilities need not regard computers as a barrier instead of an aid to their successful library use, libraries need to plan for and implement accessibility measures. Since library staff members may also have disabilities, it is important to remember that the points made in this document about access for patrons apply to access for employees as well.

It is crucial that accommodations be made to provide equitable access to the library's facilities for all patrons. This means not only using technology that translates print into speech to provide access to traditional media; it also means ensuring that new technology used to support library programs (on-line catalogs, microcomputers provided for public use of application software and the Internet, etc.) are made accessible. The focus of this document will be predominantly on this latter need.

Since about 10% of the general population is disabled, a reasonable goal would be to have at least 10% of computer equipment and resources earmarked for accessibility, although unlike disabled parking places the adapted computers should be useable by non-disabled people when a person with a disability does not require them.² Indeed, you may find that the “adaptive equipment,” whether adjustable tables, enlarging monitors, or alternatives to the standard “mouse” pointing device, may be widely used and appreciated by non-disabled people who find these accommodations more comfortable to work with.

A goal that will be stressed throughout this document is communication among patrons, staff, and other human resources. The more viewpoints and areas of expertise that can be represented during the process of implementing and maintaining accessibility, the greater the chances for successful strategies and actions that will be satisfactory to all interested parties. Checklist 1 lists initial steps for building a team of consultants; this team will ideally have a role to play throughout the implementation process.

Note for Small Libraries

This document was primarily designed with the issues facing large libraries in mind. However, small libraries (such as campus or worksite libraries) also face accessibility issues. These libraries have an advantage in that their range of patrons is likely to be more predictable, and the initial steps

¹ In this document, the term “access” is used to mean access for patrons with disabilities, unless otherwise defined in context.

² This is not intended to suggest that there is a hard and fast line between “disabled” and “non-disabled” people. The goal should be to address the access needs of patrons fairly, regardless of the degree or permanence of their disability.

towards implementing access can be more tailored towards a specific group or person. However, these libraries may also be at a disadvantage in terms of resources, particularly human resources.

Checklist items likely to be of most interest and of most practical value to small libraries have been prefixed with an asterisk.

Planning Document

Many factors go into successful implementation of adaptive technology. Librarians need to make sure that there will be sufficient funding, personnel, and foresight to establish and maintain an accessible environment. There is also a need to ensure that policies are established and enforced to facilitate this implementation and to ensure both legal compliance and smooth communication between librarians and patrons. Towards this end, it is strongly recommended that a formal planning document be developed.

This document need not be long or overly detailed, and could be generated at least in part from the minutes or follow-up tasks of planning team meetings. Try tailoring this document so that it can be used both for the process of seeking funding and other forms of support and as a historical guide for librarians who may not become involved in the accessibility process until after the initial steps have been taken.³

Potential Access Problems

Patrons with disabilities may have access needs in one or more of the following categories:

- ❖ INPUT issues affect people who have trouble with the devices used to input characters or commands into the computer. This is most likely to affect patrons who have difficulty using the standard keyboard or the standard mouse due to a diminution or loss of control of movement in their hands.
- ❖ OUTPUT issues affect people who cannot access the computer's output. This includes people who have difficulty reading the screen due to visual impairment or learning disability, people who cannot hear auditory cues or people who have difficulty reading or handling a standard computer printout.
- ❖ ENVIRONMENT includes a variety of non-computer components. Examples of potential problems include whether a person using a wheelchair can be seated comfortably at a computer table, and whether a visually impaired person can easily find appropriate signage indicating how to find the computer area. Environmental issues are often covered by the Americans with Disabilities Act Accessibility Guidelines (ADAAG); where appropriate, the relevant section of the ADAAG is cited. (The ADAAG can be found online at <http://www.access-board.gov/adaag/html/adaag.htm>, or can be ordered from your local Disability Business and Technical Assistance Center by calling 800-949-4232.)

³ Many thanks to Ray DeBuse, Woodard Bay Company, for originally suggesting the paragraphs on small libraries and the planning document.

- ❖ **DOCUMENTATION/SUPPORT/TRAINING** affects the user's ability to find help in using equipment. Documentation covers alternatives to having to read and handle printed documentation. Support ensures that staff will have the knowledge to provide guidance and troubleshooting for equipment use and the sensitivity to work effectively with patrons with disabilities. Training components provide new users of adaptive equipment with basic information and strategies for equipment use, which should both increase user success in equipment use and reduce the staff resources required for support.

Microcomputers and Dedicated Terminals

The modern library tends to deal with two types of computer systems. The first is accessed via microcomputers; the second, via dedicated terminals—i.e., terminals tied directly into a specific application, database, etc. For all practical purposes, no equipment exists to permit access into dedicated terminals; the equipment has been almost exclusively designed to permit access to microcomputers.⁴

Several options exist for making the information on these dedicated terminals accessible. The ideal is to try out any system before purchase and see if the program can be accessed via a microcomputer. For example, many libraries have on-line catalogs that users can access on-site via dedicated terminals. However, there is now often a dial-in service or a Web site that permits users to access the catalog from a microcomputer. An added advantage is provided when accessible equipment is located on-site, so that the user can find out the location of a book and access the book itself within the same building. Care should be taken to ensure that when the program is used on the microcomputer, it will be compatible with existing access strategies. For example, any system that relies heavily on highlighting and color cues to impart information will be difficult to understand by persons using speech-output screen review programs, as well as by people with color blindness.

If the system is already in place and the input and output cannot be accessed via a microcomputer, you can ensure that environmental considerations are in place—e.g., ensuring that some terminals are located on adjustable tables to provide access for people using wheelchairs, people of short or tall stature, children, people with temporary leg casts, etc. For users who still cannot access the input or output from these dedicated systems, staff may need to provide assistance.

Generic Access Strategies (Checklists 1-4)

For many users, solutions need not be complicated or expensive. For example, a strategically placed lamp or large print labels placed over certain keys on the keyboard may do wonders for some patrons with visual disabilities. Most well thought-out solutions will not hamper the ability of a non-disabled person to use the computer, and may indeed prove to be a boon to all users. The first part of this document, which consists of four checklists, explains “generic” strategies to fully or partially cover the needs of the majority of users.

⁴ CD-ROM stations may also pose problems. For an interesting, if somewhat outdated, article on one strategy for making a CD-ROM station accessible see Wyatt, Rochelle and Charles Hamilton, “Building an Accessible CD-ROM Reference Station,” Information Technology and Disabilities, 1 (1), 1994, available online at <http://bubl.ac.uk/journals/lis/com/itad/v01n0194/>.

Many patrons will have already found strategies to cover some or all of their needs, and may be willing to share these strategies. While a single solution is unlikely to accommodate all individuals with learning disabilities, for example, discussions with and among these individuals may likely uncover solutions that will benefit many of them.

The Checklists

This document provides four checklists covering generic systems. Each checklist includes an outline with items to be checked off as they are implemented, followed by explanatory comments on each checklist item. The first checklist covers team preparation measures, while the other three cover different levels of implementation, as defined by the typical expense and sophistication needed for the level of implementation being discussed.

CHECKLIST 1 (Team Preparation) covers building a framework from which decisions can be made and evaluating the environment into which adaptive computing will be introduced or enhanced. The steps in this checklist form the groundwork for making decisions about all other access measures suggested throughout the document.

CHECKLIST 2 (Low Cost/Easy to Implement Measures) covers access steps that will take a minimum of time (less than thirty minutes) and computer sophistication to implement. (Note that Checklist 2 is the longest of the four implementation checklists; almost half of all implementations fall into this category.)

CHECKLIST 3 (Moderate Cost/More Involved Measures) consists of steps that require somewhat expenditure and somewhat more computer, legal, or administrative knowledge.

CHECKLIST 4 (Annual Budget and Long-Term Purchasing Measures) covers steps that should be planned into annual budgets. It also covers steps to be included in the plans for construction or remodeling of the library, or in the widespread implementation of new software and/or hardware (such as implementation of an on-line catalog).

The items in Checklists 2 through 4 are meant as indicators rather than anything hard and fast; depending on your situation, one or more steps may be implemented at different levels. In addition, not all solutions are available for all types of computerized systems. It is impossible, therefore, to think in terms of a single “adapted computer.” You may wish to provide some solutions from Checklist 2 for the majority of computers, and designate a smaller number of computers to house solutions from Checklists 3 and 4.

Individualized Systems

Even the suggestions included in the Checklists will not accommodate every individual disabled patron. There will be some individuals whose situation requires equipment that is highly individualized and specialized. For example, some people with severe physical disabilities must use a switch to access a computer. There are dozens of types of adaptive switches available, activated by different types of body movement, and more are constantly coming on the market. It would be impossible for a library to keep all these switches in stock.

Just as the library could not be expected to perform an eye exam for a patron who clearly needs glasses, it will not be able to independently assist patrons who require their own equipment. If a patron appears to need or demonstrates interest in obtaining an individualized system, the library may wish to provide information on finding an appropriate clinician or other local professional. These professionals are able to evaluate an individual's abilities and to prescribe appropriate computer equipment. The section of this document on Individualized Systems (following the 4 checklists) contains information on assisting patrons who may need their own systems. In some cases, this individualized equipment can then be interfaced with library equipment to provide on-site access.

Bibliography Lists More Resources

The Bibliography includes sources of information on computer equipment for individuals with disabilities in general, and libraries in particular. This information includes books, articles, Web sites, databases, and conferences.

No attempt has been made to suggest specific brands or manufacturers, in part because of the varying needs of libraries and in part because adaptive technology manufacturers appear, merge, change product focus, or disappear almost as rapidly as mainstream manufacturers. Resources from the "Sources of Product Information" list should be used as a first step in contacting manufacturers. If the desired product does not appear to exist, consider contacting a manufacturer that has developed similar products, or other products for the same type of computer. A computer manufacturer could also be contacted; many have divisions specifically to serve people with disabilities. Either or both sources may be able to suggest an alternate product or may show interest in developing an appropriate product.

Funding

Although widespread implementation of accessible equipment will ideally encourage price reductions, some of the solutions will require substantial financial investment. Creative funding solutions might include some or all of the following:

- Ask the vendor if they have discount programs applicable to libraries or your parent organization
- For hardware expected to have low-incidence use, share the cost and use of the equipment across multiple branches or with other libraries or organizations
- Offer to act as a demonstration or test site for a vendor in exchange for waived or reduced cost
- Write funding for adaptive technology into grants, especially those where ADA compliance or service to people with disabilities is a requisite
- Solicit "gently used" adaptive equipment from vendors who may be looking to get rid of old models or patrons who may no longer have use for the equipment

Request for Input

This document is slated to be reviewed and updated periodically (with luck, more frequently than in the past!!!). Therefore, input is sought and warmly appreciated. Please write with suggestions, comments, and descriptions of access strategies that you have developed or implemented to Jane Berliss-Vincent at janeber@aol.com.

CHECKLIST 1: TEAM PREPARATION

This list is not meant to be exhaustive; additional measures may be required depending on specific campus situations. Blank lines have been provided for users to write in their own measures; we would greatly appreciate a copy of any measures you have added to this list. Checklist items likely to be of most interest and of most practical value to small libraries have been prefixed with an asterisk.

* ___ A. Initiate contact between library personnel and interested users.

* ___ B. Develop team of consultants on library adaptive computing.

1. This team should include persons with expertise in the following areas:

- * ___ a. Equipment currently being used in the library
- * ___ b. Programs offered by the library that involve any use of computer technology
- * ___ c. Adaptive computer equipment and peripherals
- ___ d. Access needs of people with ALL types of disabilities
- * ___ e. Current and projected demographics of users with disabilities
- * ___ f. Library funding
- * ___ g. Library computer use policy

2. Team members should ideally be drawn from the following groups of people:

- * ___ a. Library administrative staff
- ___ b. Library computing staff
- * ___ c. Potential users
- ___ d. Outside consultants
- ___ e. Professionals with clinical expertise in disability-related areas
- ___ f. Rehabilitation technologists/engineers
- * ___ g. Representatives of library's parent organization (company, college, etc.)
- * ___ h. Other groups as appropriate

* ___ C. Team walk-through of existing facilities to determine existing accessibility accommodations/problems.

* ___ D. Survey patrons to determine existing accommodations/problems.

* ___ E. Placement of article(s) in standard information sources about intention to implement computer accessibility.

* ___ F. Identification of personnel to implement accessibility measures.

___ G.

___ H.

___ I.

CHECKLIST 1: EXPLANATION OF ITEMS

A. Initiate contact between library personnel and interested users.

The initial impetus for the process of establishing adaptive computing in libraries is likely to come from representatives of at least one of these two groups; the process certainly affects both groups. There is nothing more costly than a piece of adaptive technology that users either don't know about or feel doesn't meet their needs. Getting users involved early on can go a long way towards preventing problems in the long run.

B. Develop team of consultants on library adaptive computing.

To be effective, most plans for the implementation of adaptive computing require awareness of needs and demographics of people with disabilities (both in general and among current and projected library clientele), awareness of types of adaptive computing equipment and their compatibility with standard equipment, awareness of the existing library computing environment, and awareness of related issues such as library funding. Since one individual or group is unlikely to be versed in all these areas, a team of experts drawn from the library staff and the community should be assembled to evaluate and discuss issues, share information, and represent their particular concerns. This group may be fairly large during planning phases and may become smaller as goals are met, but will need to continue to exist on a long-term basis.

1. Team should include persons with expertise in the following areas (ideally more than one in each area):

a. Equipment currently being used in the library. The type of standard equipment that patrons will need to access will influence purchasing decisions of adaptive equipment, since the standard and adaptive equipment will need to work together.

b. Adaptive computer equipment and peripherals. This team member will need some level of familiarity with equipment and strategies for access to input, output, environmental, and documentation/training/support for people with all types of disabilities (hearing, visual, physical, learning, etc.)

c. Access needs of people with ALL types of disabilities. Many people whose disabilities would initially seem irrelevant to computer use may actually need some sort of accommodation. For example, patrons with hearing-related disabilities may be able to access the computer without needing further accommodation, but may need to find ways of asking questions about where to find software or how to use a new catalog.

d. Current and projected demographics of users with disabilities. This information facilitates the process of determining the order of priority in which equipment should be acquired. Keep in mind that all libraries are likely to experience a sharp increase in the need for adaptive technology due at least to two of the fastest-growing categories of disabled computer users: aging baby boomers and individuals with computer-related injuries such as carpal tunnel syndrome or other wrist/hand/arm injuries.

e. Library funding. The way in which the library chooses to fund acquisition, maintenance, and training for computers in general is likely to influence, if not dictate, the ways that these considerations are budgeted for adaptive technology.

f. Library computer use policy. Policies for issues such as priority use of adapted computer workstations when requested simultaneously by both disabled and non-disabled patrons need to be developed in accordance with existing policies.

2. Team members should ideally be drawn from the following groups of people:

a. Library administrative staff. These persons will know about issues such as library funding, policies, and plans for future developments in the library infrastructure.

b. Library computing staff. This group will know about day-to-day operations of and problems in the computing areas.

c. Potential users. These persons are not only the most likely to know about potential barriers to effective computer use, they are also the most likely to have had actual user experience with adaptive technology.

d. Outside consultants. This may involve members of local disability-related groups (see Appendix, “Disability-Related Organizations,” for examples), vocational rehabilitation counselors, etc.

e. Professionals with clinical expertise in disability-related areas. This may include interface specialists (generally occupational therapists with knowledge of physical barriers that may prevent an individual from effectively using technology) and seating/positioning/mobility specialists (therapists or engineers who work with issues relating to proper positioning in chairs or wheelchairs for maximal access). The list may also include physical therapists and occupational therapists. See section on “Individualized Systems” for ways to locate these professionals in your area.

f. Rehabilitation technologists/engineers. These are persons with a thorough knowledge of technology use by persons with disabilities. The strategies suggested in “Individualized Systems” may also work to locate these professionals locally.

g. Representatives of library's parent organization (company, university, etc.). These persons may have a broad overview on ways that technology in general, and adaptive technology in particular, is being implemented throughout the organization.

h. Other groups as appropriate. Depending on the library's individual situation, it may become necessary for representatives of other groups need to be involved. For example, if adaptive technology is being implemented over a multi-branch library system, then representatives of all branches will need to be involved.

C. Team walk-through of existing facilities to determine existing accessibility accommodations/problems.

A variety of accommodations are likely to already exist in the computer labs, particularly since some computer manufacturers are building in accessibility features as part of their standard hardware or system software (check their manuals for further information) and since the buildings may already fully or partially comply with accessibility laws (see Checklist 3, Item C1). One or more members of the consultant team may also be aware of equipment purchased for the benefit of a few patrons but never publicized or made generally available. Use the ADAAG and a copy of Checklists 2 through 4 to measure current accessibility and to determine the necessary steps for implementing further accessibility.

D. Survey patrons to determine existing accommodations/problems.

The survey should not only serve as a way to gather information; it should also be a means of notifying patrons of what is being planned, and of giving them as early an opportunity as possible to express opinions. The survey may also pique interest among patrons experienced with adaptive computer use, who are likely to have useful suggestions and may make excellent new members of the consultant or training team. The survey should be administered anonymously. Survey questions could cover the following areas: disability types, previous experiences with both standard and adaptive computer use, problems encountered in using computers in the library, priorities for types and location of adaptive equipment to be purchased, and library-specific questions as appropriate.

E. Placement of article(s) in standard information sources about intention to implement computer accessibility.

It would be difficult to over-publicize the implementation (and later, the availability) of accessible technology. The survey discussed above may only reach those patrons who have identified themselves as having a disability. Patrons with temporary disabilities may not realize that such equipment is available even when they need it. For public libraries, a continuous stream of information about the implementation process and equipment availability can be distributed through such media as the library newsletter, local newspapers, and local radio or TV stations. Smaller libraries should exploit in-house information sources.

F. Identification of personnel to implement accessibility measures.

Responsibility will need to be assigned so that it is clear who will be executing the implementation measures at every step and for every item. A follow-up procedure should also be instituted to ensure that measures are implemented in a timely, efficient, and thorough manner.

CHECKLIST 2: LOW COST/LOW IMPLEMENTATION TIME MEASURES

Implementations covered by this checklist usually cost less than \$100 each (many are free) and require minimal computer sophistication. This list is not meant to be exhaustive; additional measures may be required depending on specific library situations. Blank lines have been provided for users to write in their own measures; we would greatly appreciate a copy of any measures you have added to this list. Checklist items likely to be of most interest and of most practical value to small libraries have been prefixed with an asterisk.

A. Input

- * ___ 1. Access solutions built into the operating system
- * ___ 2. Alternative labels for the keyboard and keypad keys
- * ___ 3. Keyguards
- * ___ 4. An illuminated magnifying lamp that can be easily positioned
- * ___ 5. Devices to allow easy handling of floppy disks
- * ___ 6. Surge protector power strip placed in an easily accessible location
- * ___ 7. Cable adapters
- * ___ 8. "Do-It-Yourself" solutions
- ___ 9.
- ___ 10.

B. Output

- * ___ 1. Adjustable redundancy of auditory output
- * ___ 2. Earphones for speech synthesizer users and people who need to set the auditory output to a loud level.
- ___ 3.
- ___ 4.

C. Environment

- * ___ 1. Ensure that there is an accessible path between the wheelchair entrance and the computer area(s)
- * ___ 2. Heavy earphones (such as those worn by jackhammer operators)
- * ___ 3. Position terminals to best take advantage of lighting source
- * ___ 4. Temporarily "adapt" tables to make them accessible by placing them on blocks (see Checklist 4, Item C1)
- ___ 5.

D. Documentation/Support/Training

- * ___ 1. Indicate accessible equipment/entrances in any general brochure of library hours and features
- * ___ 2. Post large-print signs on library doors indicating that adaptive equipment is available
- * ___ 3. Label computers and workstations designated as accessible
- * ___ 4. Identify personnel to construct and install simple modifications
- * ___ 5. Find or create "cheat sheets" for common adaptations
- ___ 6.

CHECKLIST 2: EXPLANATION OF ITEMS

A. Input

1. Access solutions built into the operating system. This usually includes at least the following, available through the control panels:

- “Sticky keys” (allows standard key combinations, such as SHIFT-[letter], to be pressed sequentially rather than simultaneously)
- Control of key repeat rate and key input acceptance rate
- Cursor control via keypad keys as an alternative to the mouse
- Auditory indication of the status of toggle keys (NumLock, Caps Lock, Scroll Lock)
- Support for alternative keyboard layouts, particularly the Dvorak layout (available in two-hand, left-hand, and right-hand configurations; often used by one-handed typists)

In addition, some operating systems may have a “Serial Keys” control panel option that allows some communication devices to be used for computer entry. Some operating systems also have a sophisticated set of keyboard shortcuts that work with almost all applications; for example, in Windows, pressing the ALT key moves the cursor directly up to the menu bar and selects the leftmost menu.

2. Alternative labels for the keyboard and keypad keys Transparent Braille or other raised labels placed on some or all keys may provide a tactile method of orientation to the keys for users with total blindness, while still permitting other users to orient themselves visually. For users with some vision, large-print labels make keys easier to find. Labels are also available to reconfigure any keyboard to reflect any of the three Dvorak layouts.

3. Keyguards Keyguards are keyboard-sized sheets of plastic or other smooth materials that have holes cut in them; each hole corresponds to a key. Users who have difficulty hitting keys accurately may find keyguards useful for reducing the number of unwanted keys they type. Keyguards may be purchased or made in-house from Plexiglas or a similar material.

4. An illuminated magnifying lamp that can be easily positioned. An illuminated magnifying lamp may make keys or printed materials easier to see for persons with a variety of disabilities.

5. Devices to allow easy handling of floppy disks Devices are available to permit handling of floppy disks and other materials by users with little or no use of their arms or hands. Most of these are mouth-controlled and allow disks to be inserted and removed. Check with the vendor for suggestions on maintaining sanitation of these devices for multiple users.

6. Surge protector power strip placed in an easily accessible location Besides protecting the computer from voltage surges, a surge protector power strip permits all equipment for the computer to be plugged into a single place so that the user only needs to hit one switch to turn on all equipment. The power switch may be placed in a variety of accessible locations near the computer, eliminating the difficult or impossible task of reaching around to the back of the computer, printer, etc. to turn it on.

7. Cable adapters. Some patrons may have specialized keyboards that they can bring with them to the library to use with library computers. Since some of these may have cables that are a different standard than the cable ports used by the library computers, it can be useful to have some cable adapters available. These are usually under \$5 each and come in a variety of configurations (PS/2 to AT, AT to serial, etc.). “Y-split” cables are also available; these allow multiple keyboards or mice to be attached at a time, which may be useful for situations where, for example, two individuals are working together. It is recommended that a policy be implemented to have the actual attaching and detaching of equipment to the computer performed by a trained library staff member to avoid equipment problems.

8. “Do-It-Yourself” solutions. Some access problems can be solved by creative use of inexpensive materials. For example, individuals who have difficulty typing without moving the keyboard can be accommodated by using Velcro to hold the keyboard in place, and “locator” nubs on home row keys can be enhanced with three-dimensional fabric paint. Hardware stores, craft shops, and office supply stores can be good sources for these types of solutions.

B. Output

1. Access solutions built into the operating system. This usually includes at least the following, available through the control panels:

- Visual redundancy for error indications and other information communicated exclusively through sound
- Volume control

In addition, control panels often permit display adjustment of on-screen elements, including icon size, type size and typeface, and system colors.

Some application programs are also beginning to include output access features; for example, most mainstream Internet browser programs now allow the user to specify display text size, text and background colors, etc., overriding the original page display specifications.

2. Earphones for speech synthesizer users and people who need to set the auditory output to a loud level.

Speech output users, persons who require that the auditory output be at a high level, and persons accessing programs or Web sites with sound output will require headphones so as not to disturb other patrons. These headphones may be supplied with many speech synthesizer packages, or may be available at low cost. Patrons should be warned, however, against the prolonged use of headphones with high levels of auditory output.

C. Environment

1. Ensure that there is an accessible path between the wheelchair entrance and the computer area(s) Determine the most accessible path between the wheelchair entrance and the computer areas, and provide maps or signage. Confirm that people with physical disabilities can open all doors along this path. (See also Checklist 4, Item C1 and ADAAG, section 4.3)

2. Heavy earphones (such as those worn by jackhammer operators)

If there are no quiet rooms available in the library, heavy earphones should be provided so that an appropriate environment can be created for people who require a very quiet atmosphere to work effectively.

3. Position terminals to best take advantage of lighting source

Terminals should be positioned in such a way that glare on the screen is minimized. If the main lighting is provided by sunlight, position monitors at right angles to windows with adjustable blinds or curtains. (If this is not possible, polarizing lenses that fit over the screen are available inexpensively.) Fluorescent lights with wattage of at least 75 should provide overhead lighting; a higher-wattage bulb may be needed for labs with unusually high ceilings. Any lamps provided should be adjustable.

4. Temporarily “adapt” tables to make them accessible by placing them on blocks

“Adapt” tables to make them accessible by placing them on sturdy blocks to raise them so that the bottom of the table is 28” from the floor. This should be a TEMPORARY measure until adjustable tables can be purchased (see Checklist 4, Item C1)

D. Documentation/Support/Training

1. Indicate accessible equipment/entrances in any general brochure of library hours and features

General library literature is an excellent place to list information on types of available accessible equipment, location of wheelchair-accessible entrances, etc.

2. Post large-print signs on library doors indicating that adaptive equipment is available

Signs on computer lab doors indicating that adaptive equipment is available should be low enough to be read by people who use wheelchairs or who are short, and should be large enough for people with low vision to read. The signs should briefly indicate what types of equipment are available, what the procedure is for accessing the equipment (e.g., “Ask the reference librarian for assistance”), and where additional help can be obtained. (See also Checklist 3, Item C2.)

3. Label computers and workstations designated as accessible

This should let individuals know what adaptations are available on which station.

4. Identify personnel to construct and install simple modifications

Simple modifications to standard equipment in accessible workstations may need to be made to accommodate users. For example, it may prove impossible to find a surge protector power strip (see item A10 above) with an on/off switch large enough to be accessed by persons with some motor or manual disabilities; simple, inexpensive modifications can be put in place to give the user a larger area to work with. Personnel or outside volunteers should be identified who can make these modifications when necessary. A small budget should be allocated for construction materials.

5. Find or create “cheat sheets” for common adaptations

“Cheat sheets” may already be posted in product documentation or on a developer’s Web site or can usually be created quickly.

CHECKLIST 3: MODERATE COST/MODERATE IMPLEMENTATION TIME MEASURES

For each item, implementation cost is \$100 - \$500 and/or require more sophistication about computers, legislative requirements for accessibility, or library administration. This list is not meant to be exhaustive; additional measures may be required depending on specific library situations. Blank lines have been provided for users to write in their own measures; we would greatly appreciate a copy of any measures you have added to this list. Checklist items likely to be of most interest and of most practical value to small libraries have been prefixed with an asterisk.

A. Input

- * ___ 1. Test existing software with accessible equipment
- ___ 2. Three or four different types of alternative keyboards
- * ___ 3. Three or four different types of alternative mice
- * ___ 4. Spell checker and thesaurus software
- ___ 5. Word prediction software
- ___ 6.
- ___ 7.

B. Output

- * ___ 1. Adjustable character magnification software that permits large-type copies to be viewed
- * ___ 2. Provide speech output programs for use by individuals with learning disabilities
- ___ 3.

C. Environment

- * ___ 1. Make sure the computing area is up to current ADA regulations
- ___ 2. Permanent signage near entrances indicating location of computer area(s) and route(s) from that entrance
- ___ 3.
- ___ 4.

D. Documentation/Support/Training

- * ___ 1. Train computing staff on sensitivity to people with disabilities, and equipment function and procedures
- * ___ 2. Arrange for library information to be available in alternative formats
- * ___ 3. If the library has a general goal statement, prepare a goal item on accessibility
- * ___ 4. Obtain documentation on disk
- * ___ 5. Recruit individuals to train users and library staff in adaptive equipment use
- * ___ 6. Implement fair policies affecting use of adaptive equipment and library services
- ___ 7.

CHECKLIST 3: EXPLANATION OF ITEMS

A. Input

1. Test existing software with accessible equipment

Test whatever software is used by the library with accessible equipment as it is purchased or, better yet, as it is borrowed on a trial basis from the manufacturer. Ask the manufacturer about any known incompatibilities; if they have not yet tested a particular product with the software you use, ask if you can test it for them in exchange for a free or discounted product.

2. Three or four different types of alternative keyboards

A wide variety of alternative keyboards are available, and more are coming on the market every year. Three of the categories to consider are:

- Adjustable keyboards, which can be positioned in a variety of ways to accommodate a variety of users. (Avoid fixed “ergonomic” keyboards.)
- Small-footprint keyboards with standard-size keys, which can be useful to one-handed typists and people with range of motion problems. (Colorful small-footprint keyboards with smaller keys are also available for children and may be worth considering for children’s libraries.)
- On-screen (software) keyboards, which can be operated with a mouse or switch. Make sure that you select an on-screen software package that includes scanning (automatically moves among “keys” until the user selects the desired option); this facilitates switch use.

Make sure that these keyboards have a sufficient key set to support software used by the library. It is also recommended that a policy be implemented to have the actual attaching and detaching of physical keyboards to the computer performed by a trained library staff member to avoid equipment problems.

3. Three or four different types of alternative mice

A number of alternatives to the standard mouse (used to control cursor movement) are available. These are beneficial both to individuals who have physical difficulty using a mouse, and those who do not have sufficient hand-eye coordination to use a mouse effectively. Some of the categories to consider are:

- Trackballs
- Touch pads
- Touch windows (which fit over the screen and permit the user to click directly on the item they wish to select)

Again, it is recommended that a policy be implemented to have the actual attaching and detaching of mice to the computer performed by a trained library staff member to avoid equipment problems.

4. Spell checker and thesaurus software

If not already an integral part of any word processing program being used, spell checker and thesaurus software should be provided. This will assist both persons with learning disabilities and persons using optical character recognition systems (see Checklist 4, Item A1).

5. Word prediction software

Word prediction programs can greatly speed up typing for some individuals with physical or cognitive disabilities. When a letter is typed, the word prediction program brings up a list of words starting with that letter; the user then either chooses the desired word or keeps typing until the word appears or the word is completed.

B. Output

1. Adjustable character magnification software that permits large-type copies to be viewed

Character magnification software permits large-type copies to be viewed and permits the range of magnification to be adjusted, usually up to about 16 times standard size, although the material will usually be printed out at unmagnified size and the actual document will need to be modified to permit large-print printing. These programs usually have several magnification “modes” that allow all or some of the screen to be magnified at a time. Some types of character magnification software may also permit the cursor to be enlarged or modified. (Note that the “Magnifier” utility included in Windows 98 and higher is not sufficient for most needs.)

2. Provide speech output programs for use by individuals with learning disabilities

Speech output can be useful to some people with learning disabilities. Unlike speech output solutions for blind individuals, speech output for individuals with learning disabilities tend to be simpler and less expensive since they do not need to provide alternatives to mouse use (see Checklist 4, Item B.1.). Some of these programs will read system elements, such as menu bars. Some also include other utilities of use for learning disabled individuals, such as homophone checkers (similar to spell checkers, these help users distinguish between homophones such as “there,” “their” and “they’re”).

C. Environment

1. Make sure the computing area is up to current ADA regulations

Any barriers found during the team walk-through described in Checklist 1, Item C should be discussed with the person or department responsible for building operations. Follow-up should be done to ensure that existing problems are recognized and fixed in a timely manner. Keep in mind that the ADAAG mandates not only accessibility within the computing area, but also an “accessible path of travel” to the computing area and accessibility of other public-use areas, such as bathrooms.

2. Permanent signage near entrances indicating location of computer area(s) and route(s) from that entrance

Permanent signage near all entrances should indicate the location of the computer lab and the most accessible route from that entrance. The signs should have text in both large raised letters and Braille, and a visual/tactile map of the route. (The Yellow Pages lists companies that specialize in ADA signage.) The ADA regulations for permanent signage are listed in ADAAG Section 4.30.

D. Documentation/Support/Training

1. Train staff on sensitivity to people with disabilities, and equipment function and procedures

All library staff should be trained in sensitivity to needs of people with disabilities, and should be available to provide services as needed. This might entail listening closely to what a manually disabled patron wishes to have typed into the system and typing it according to her exact specifications (rather than trying to guess what she would like to type in), or asking a person with blindness exactly which parts of the screen he wishes to have read off. These services should be widely publicized, and should be able to be requested with a minimum of patron embarrassment.

Staff should also receive general information on adaptive equipment as well as on procedures for obtaining help if equipment malfunctions. Ideally, at least one staff member trained in operation of adaptive equipment should be available at all times. New employees should be told who the trained staff members are and how they can be contacted for assistance.

2. Arrange for library information to be available in alternative formats

Have crucial information—hours, sources of help, basic computer operation procedures—read onto a tape. Implement a policy for distributing the tape—e.g., if users bring in a blank tape, the library will copy the tape for them. Where appropriate, materials should also be made available in Braille.

3. If the library has a general goal statement, prepare a goal item on accessibility

This goal statement should be consistent with the findings and actions of the consultant team, and should be reviewed annually.

4. Obtain documentation on disk

Documentation on disk can be used on the computer or printed out in large type or Braille. Contact manufacturers to see if documentation is available on disk. If not, the documentation may be available on disk from Recordings for the Blind (<http://www.rfbd.org> lists the nationwide branches) for a nominal fee.

5. Recruit individuals to train and support users and library staff in adaptive equipment use

These individuals should be screened for their ability to work comfortably with patrons and staff, and for their technical ability. Ideally, they will themselves be users of the adaptive technology with which they are providing assistance; otherwise, they should be given the same training mentioned in D1 above. If at all possible, funds should be made available to pay these individuals.

6. Implement fair policies affecting use of adaptive equipment and library services

Among other situations, these policies should cover the following:

- Priority usage of adaptive equipment by people who need to use it over people who prefer to use it. (Strong demand for a particular piece of technology—e.g., trackballs—by non-disabled patrons may indicate a need to acquire more units of the technology!)
- Modified time limits or fee structures for computer use by people whose disabilities impede their typing speed
- Training and other requirements as a prerequisite for using specialized equipment
- Procedures for acquiring equipment when requested by one or more users

CHECKLIST 4: ANNUAL BUDGET MEASURES

To be planned into annual budget, plans for construction or remodeling of the library, widespread implementation of new software and/or hardware (such as implementation of an on-line catalog), or for special solicitation of funds. This list is not meant to be exhaustive; additional measures may be required depending on specific library situations. Blank lines have been provided for users to write in their own measures; we would greatly appreciate a copy of any measures you have added to this list. Checklist items likely to be of most interest and of most practical value to small libraries have been prefixed with an asterisk.

A. Input

- * ___ 1. Specialized optical character (OCR) reading system
- ___ 2.
- ___ 3.

B. Output

- * ___ 1. Plan the best setup for accommodating blind users
- * ___ 2. Large-size monitors
- * ___ 3. Magnifying closed-circuit cameras
- ___ 4.
- ___ 5.

C. Environment

- * ___ 1. Adjustable tables
- * ___ 2. Adjustable chairs
- * ___ 3. Consider accessibility when constructing or remodeling the library
- ___ 4.

D. Documentation/Support/Training

- * ___ 1. Design and implement a training program for users of complex equipment
- * ___ 2. Plan the best strategy for supporting hard-of-hearing and deaf users
- * ___ 3. Make sure the library Web site is fully accessible

CHECKLIST 4: EXPLANATION OF ITEMS

A. Input

1. Specialized optical character (OCR) reading system

An optical character reader (OCR) system permits printed materials to be scanned and converted into computer-readable format and stored as a computer file. OCRs designed specifically for blind and low-vision users can read the material aloud and provide mouse emulation; others have a variety of features to meet the needs of individuals with learning disabilities (and may also be useful for patrons learning literacy skills, patrons learning English as a second language, etc.) It is recommended that a spell checker be used with the translated files, since the error rate in the translation may vary based on the quality of the original materials.

Many materials (e.g., many daily newspapers and weekly periodicals) are now available via the Internet and may be better accessed through the appropriate Web site than through OCR.

Self-contained OCR units are also available. These may be more appropriate for some libraries; however, because they are not connected to a computer they do not allow scanned text to be manipulated, spell-checked, etc.

B. Output

1. Plan the best setup for accommodating blind users

A wide variety of access solutions for blind users are now available. Some involve use of speech output, some support use of Braille output, and some have both capabilities. Some speech output solutions work generically with almost all applications; others only work with a particular type of application, particularly the Internet. All solutions need to provide not only an output alternative to the screen, but also an input alternative to the mouse. These applications tend to have a high learning curve, particularly for individuals with little or no prior computer experience. Experienced blind users of adaptive technology may have strong preferences for one brand of technology over another.

All speech output solutions also require some type of speech synthesizer technology. These days, the synthesizer usually takes the form of software that is included with the speech output program. The quality of this synthesizer will likely be sufficient for most users; however, users who also have hearing loss may need a hardware synthesizer that provides higher quality at a considerably higher price.

When developing their accommodation setup for blind users, libraries should consider the following factors:

- Preferences and expertise of blind patrons or potential patrons (these individuals may also be recruited to provide training or support; see Checklist 3, item D.5. above)
- Current and projected computer-related services provided by the library (e.g., if the library does not currently provide public Internet access, Internet access solutions are currently not necessary)

- Support level of various vendors—upgrade policies and prices, online or telephone support availability, warranties, etc.
- If possible, a demographic overview of the likely user population (e.g., if the majority of your user population consists of individuals who have lost their sight because of age, they may be less likely to use Braille but more likely to need a higher-quality synthesizer)
- Other factors of relevance to the particular library setup

Keep in mind that if you offer some library functions over the Internet (e.g., an online catalog), many blind users may choose to access them at home or at the office via their own equipment. Web site accessibility is therefore imperative (see D.3. below). Keep in mind as well that some users may be unable or unwilling to use your adaptive technology setup and will therefore need alternatives, such as assistance from a staff member.

2. Large-sized monitors

Large-sized monitors (19" and larger) are useful when working with magnification technologies. Keep in mind that for every two inches of monitor over 19", the monitor price roughly doubles. The monitor should have a low dot pitch (under .25) for image clarity and a refresh rate over 72 Hertz to avoid flicker.

3. Magnifying closed-circuit cameras

Magnifying closed-circuit cameras (also called CCTVs) will permit users to conveniently examine any printed materials (such as manuals or materials being typed) while working on the computer. The more sophisticated (and slightly less expensive) systems can be connected to the computer and have split screens, allowing computer and printed materials to be displayed on the same screen, at different rates of magnification if desired; however, CCTVs are not OCR devices and will not transfer magnified materials into computer-readable format.

C. Environment

1. Adjustable tables

Adjustable tables should accommodate both wheelchair users and people whose height makes use of standard tables difficult. These tables should also provide adequate workspace.

2. Adjustable chairs

Adjustable chairs should provide both support and stability. The backs should be large and adjustable, and the base should have five legs with rolling casters. An assortment should be provided, including models with and without arms.

3. Consider accessibility when constructing the library

The computer area should be constructed in an accessible location; ideally, on the first floor or close to an elevator, and within a short distance of an accessible bathroom. There should be a minimal number of doors between the outdoors and the lab, and all of these doors should have handles that are easy to operate, or buttons that may be pushed for automatic door opening. ADAAG will be of considerable help in providing specifications for accessibility; input from patrons should also be solicited.

D. Documentation/Support/Training

1. Design and implement a training program for users of complex equipment

The training program should include provisions for alternative formats of both print materials (such as large print) and communication (such as American Sign Language). The training program should be offered regularly, and should be listed with other training courses given by the library. On demand, “mainstream” courses should be adapted so they can be offered via alternative formats.

2. Plan the best strategy for supporting hard-of-hearing and deaf users

Consult with your hearing-disabled patrons to find out what strategies they would prefer to use in communicating with staff. Depending on the situation, it may be useful to have staff members learn a rudimentary sign language vocabulary, or have a telecommunications device for the deaf (TDD) installed for communication with staff in another part of the building. Evaluate your resources and requests, and experiment to find out what works in your environment.

3. Make sure the library Web site is fully accessible

Web accessibility covers both inherent usability (e.g., use of text and background color combinations that provide good contrast) and compatibility with adaptive technology. The current guidelines for Web site accessibility are available online at <http://www.w3.org/TR/WAI-WEBCONTENT>. A wealth of resources to assist in implementing Web accessibility are listed at <http://www.webable.com>.

INDIVIDUAL ACCESS MEASURES

Even the wide range of generic equipment described in the checklists will not be sufficient for some users; these people will often require their own equipment. For some users, this may be as simple and inexpensive as a mouth-held or head-mounted stick for typing. For others, however, a more sophisticated personal system may be required. To ensure a correct fit between individual needs and abilities and personal systems of access equipment, an evaluation by a professional is strongly recommended.

There will be a period while library access is being implemented when a large number of patrons will not be able to use existing equipment; therefore the first priority in equipment purchase should be to buy systems flexible enough to meet current requests and adjustable for future users with disabilities.

However, there will always be patrons who will have an interest in obtaining their own equipment for daily personal use. The following is a list of likely sources of information on local professionals who understand computer adaptations:

- Alliance for Technology Access (ATA) member centers (current list available at <http://www.ataccess.org> or by calling 415-455-4575)
- State Tech Act centers (current list available at <http://www.resna.org/taproject/at/statecontacts.html>)
- RESNA lists individuals who have passed its credentialing examination at <http://www.resna.org/cert/index.htm>
- Independent Living Centers (partial list and information on ordering a full list available at <http://www.ilru.org/silc/silcdir/index.html>; you can also try searching the Web under “independent living” and your state’s name)
- Occupational Therapy, Communication Disorders, or Rehabilitation Engineering departments of local rehabilitation centers or hospitals.
- Local branches of the state Department of Vocational Rehabilitation
- Occupational Therapy, Communication Disorders, or Rehabilitation Engineering departments of local colleges or universities
- Local disability-related organizations (see Appendix, “Disability-Related Organizations,” for suggestions and addresses.)

Suggest to patrons that they contact potential evaluators to find out the following information:

- Credentials
- Areas of expertise
- Ability to permit clients to have hands-on experience using several types of equipment
- Restrictions on clients served
- Funding (fee for service, grant funds, etc.)

BIBLIOGRAPHY

Please inform the author (janeber@aol.com) of any additional resources.

Sources of General Information

The Alliance for Technology Access. Computer and Web Resources for People With Disabilities: A Guide to Exploring Today's Assistive Technology. (book that provides a great summary of adaptive technology options) Available from most major book sources, such as amazon.com, or from the publisher, Hunter House, at 800-266-5592

Disability periodicals, often available partially or entirely online. Three of the best are New Mobility (<http://www.newmobility.com>), Ragged Edge (<http://www.ragged-edge-mag.com/>) and Mouth (<http://www.mouthmag.com/>).

Paciello, Michael G. Web Accessibility for People With Disabilities (invaluable resource on making Web pages accessible)

Available from most major book sources, such as amazon.com

Project EASI (superb resource on adaptive technology in public areas)

General Web site: <http://www.rit.edu/~easi/>

Library section: <http://www.rit.edu/~easi/lib.htm>

Trace Center (outstanding nationwide, federally-funded center on adaptive technology)

Check out their home page at <http://trace.wisc.edu>

Resources of Particular Relevance to Libraries

Castorina, Carmella, and Norman Coombs. Information Access and Adaptive Technology.

Available from some major book sources, such as amazon.com

Church, Jennifer, Sharon Drouin, and Katherine Rankin. "Electronic resources on disabilities"

Available online at <http://www.ala.org/acrl/resfeb00.html>

Dempsey, Roth and Yoder. "Library Service to Patrons with Blindness and Visual Impairments."

Available online at <http://alexia.lis.uiuc.edu/~lis405/special/blindres.htm>

Information Technology and Disabilities (journal)

Available online at <http://bubl.ac.uk/journals/lis/com/itad/>

Lisiecki, Christine. "Adaptive Technology Equipment for the Library." Computers in Libraries, 19 (6), June 1999.

Available online at <http://www.infotoday.com/cilmag/jun99/lisiecki.htm>

Mates, Barbara T. Adaptive Technology for the Internet

Available online at http://www.ala.org/editions/openstacks/insidethecovers/mates/mates_toc.html

Nussbaum, Ruth. "Reference Bibliography: Library and Information Services to Individuals with Disabilities."

Available online at <ftp://ftp.loc.gov/pub/nls/reference/biblio/library.services>

Strauss, Carol. "Reference Circular: Assistive Devices for Use with Personal Computers."

Available online at <http://www.loc.gov/nls/reference/assistive.html>

Disability Demographic Information

ASPE's Disabilities and Managed Care Web Site (part of the Department of Health and Human Services) links to many relevant sites at <http://managedcare.hhs.gov/research/data/index.html>

The Disability Statistics Center has a Web site at http://dsc.ucsf.edu/UCSF/spl.taf?_from=default

Sample Web Sites of Libraries that have Implemented Adaptive Technology

N.B.: These sites are for reference; inclusion does not necessarily indicate author endorsement.

- Carleton University: <http://www.library.carleton.ca/data/welcome/allstations.html>
- Chicago Public Library: <http://cpl.lib.uic.edu/012disability/cpldis.html>
- Library of Congress: <http://www.loc.gov/loc/visit/ada.html>
- San Francisco Public Library: <http://sfpl.lib.ca.us/www/services.html>
- University of Michigan: <http://www.umich.edu/~sites/info/atcs/>
- University of Washington:
<http://www2.cac.washington.edu/computing/atl/DOCS/atl.use.html>

Access Departments of Major Computer System Developers

N.B.: These pages usually have links to information about built-in access features

Apple Computer Special Needs Solutions

Web site: <http://www.apple.com/education/k12/disability/> (covers all age ranges)

IBM Accessibility Center

Web site: <http://www-3.ibm.com/able/>

Microsoft Accessibility

Web site: <http://www.microsoft.com/enable/>

Sun Microsystems

Web site: <http://www.sun.com/access/>

Sources of Access Guideline Information

ADA Accessibility Guidelines for Buildings and Facilities (ADAAG)

Published by the (Federal) Access Board to provide guidelines for Americans with Disabilities Act (ADA) compliance. Section 8 specifically covers access in libraries.

Available at <http://www.access-board.gov/adaag/html/adaag.htm>

“Electronic and Information Technology Accessibility Standards”
Guidelines published in December 2000 by the (Federal) Access Board to provide “final accessibility standards for electronic and information technology covered by section 508 of the Rehabilitation Act Amendments of 1998.”

Available at <http://www.access-board.gov/sec508/508standards.htm>

“Managing Information Resources for Accessibility”

Published by the IT Accommodation Division (CITA), General Services Administration (GSA).

Available online at <http://www.itpolicy.gsa.gov/cita/front.htm>

National Center for Accessible Media (NCAM) is continually producing guidelines for multimedia access (animation, CD-ROMs, etc.)

Web site: <http://main.wgbh.org/wgbh/pages/ncam/>

“Web Content Accessibility Guidelines”

The latest version is available at <http://www.w3.org/TR/WAI-WEBCONTENT>

Sources of Product Information

ABLEDATA (searchable database of thousands of products of interest to people with disabilities)

Available online at <http://www.abledata.com>

CTG Solutions (Database) and Closing the Gap (Bimonthly newsletter)

A wealth of information is available online at <http://www.closingthegap.com/>

disABILITY Information and Resources (rich source of links)

Available at <http://www.eskimo.com/~jlubin/disabled/>

Disability-Related Organizations

The Web sites and phone numbers for national headquarters of organizations are listed; some of these groups have local chapters. This list focuses primarily on organizations run by people with disabilities rather than charitable organizations. It is not intended to be comprehensive. You may also contact local initiatives, e.g., disabled student services offices of postsecondary institutions.

American Association of People with Disabilities (AAPD)

<http://www.aapd.com/>

1-888-712-4672

International Dyslexia Association (IDA)

<http://www.interdys.org/>

Messages (800) ABCD123, Voice (410) 296-0232

National Association of the Deaf (NAD)

<http://nad.policy.net/> (click on the “Affiliates” link for other organizations)

301-587-1788 Voice; 301-587-1789 TTY

National Federation of the Blind (NFB)
<http://www.nfb.org/>
(410) 659-9314

National Multiple Sclerosis Society
<http://www.nmss.org/>
1-800-344-4867

National Spinal Cord Injury Association (NSCIA)
<http://www.spinalcord.org/>
(800) 962-9629

Self-Help for Hard of Hearing People (SHHH)
<http://www.shhh.org/>
(301) 657-2248 voice; (301) 657-2249 TDD

Organizations and Conferences Relating to Computers and Disability

American Library Association (ALA)
Professional organization of librarians. Disability-related interest groups within ALA include ASCLA's Americans with Disabilities Act (ADA) Assembly (many useful links are located at <http://www.ala.org/ascla/issues.html>). Conference held biannually (winter and summer) in varying locations.
For more information: <http://www.ala.org/>

Closing the Gap (CTG)
Conference focused on computers and disability, particularly in K-12 education. Conference held annually, late October, in Minneapolis.
For more information: <http://www.closingthegap.com/>

RESNA (an association for the advancement of rehabilitation technology)
Professional interdisciplinary organization concerned with all aspects of rehabilitation technology; conference features some presentations and equipment displays related to computers; has special interest group on computer applications. Conference held annually, mid-June, in varying locations.
For more information: <http://www.resna.org>

Technology and Persons with Disabilities (CSUN)
Conference focused on computers and disability, particularly in postsecondary education and employment. Conference held annually, mid-March, in Los Angeles.
For more information: <http://www.csun.edu/cod/>