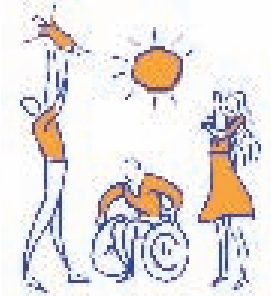


## The Evolution of AT: A Long Night's Journey into Day



### In this Issue...

In the beginning the technology had no defining name. Its pioneers included earnest engineers aiming to help their own kids with disabilities or their friends' children, or a neighbor or a school. Then, in 1982, a writer specializing in this emerging technology, while researching an article he was preparing for the Washington Post, tried to conjure an evocative name for what he was describing. "The story was about a blind user of a talking terminal. I began to jot down possible names for the technology, but I couldn't pronounce them," recalls the writer, John M. Williams a life-long stutterer. "All the words were associated with 'aids' or 'helps.' Then I arrived at the word 'assists.' I looked at that word on my writing pad and said to myself, 'Yes, that's what the technology does, it assists. But I couldn't pronounce the various forms of 'assists' – until I came to assistive technology. That was a term I could pronounce. I used the term in the story and the editor let it go by." Soon, he remembers, friends and colleagues began telling him how much they liked the name assistive technology. "They said it was unique, accurate and memorable."

Powered by federal and state disabilities legislation, the concept of "assistive technology" has evolved with the technology revolution driving the information age. Today, in its high-tech iteration, it is as sophisticated and effective as any technology in any category. In its no- or low-tech version it is simple yet effective. Those, like John Williams, who have witnessed AT's evolution and experienced AT's benefits and growing acceptance continue to marvel at the road traveled from darkness into light. This issue takes a look back at AT's evolution and offers a glimpse of what is to come.

### John M. Williams Speaks – and Writes

He remembers the exact day when his disability was ignited: February 14, 1954, Valentine's Day. For months before that watershed day his second grade teacher at a public

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elementary school in Kingston, Pennsylvania, using tactics that were not unusual then, attempted to coerce him away from using the left hand that he favored in everyday tasks, like writing. "For five months she tried to get me to change from being a left-handed writer to a right-handed writer. She made me sit on my left hand. She tied my left hand to my side. I never told my parents because I believed my inability to write with my right hand was my fault." Then came Valentine's Day 1954. "I was in her class and writing with my left hand. She charged down the aisle armed with a steel ruler, yanked the pencil out of my left hand and proceeded to crack my wrist and knuckles with that steel ruler until they bled. As she smacked me she yelled, 'You know you've done something wrong!'"

John remembers leaving a trail of blood droplets as he was marched from his classroom to the principal's office. "I received physical therapy for more than one year. While I was recovering I began stuttering." Although he regards his disability "as more of a curse than a blessing," John has spent his professional life writing prolifically about disabilities and the assistive technology that supports those who need AT as an equalizer.

Since the 1970s he has written more than 2,000 articles on disabilities. A former editor and publisher of Assistive Technology News, John has written numerous stories for the New York Times and Washington Post and was an award-winning columnist for BusinessWeek Online. His articles have also appeared in the Houston Post, Los Angeles Times, The London Times, People Magazine, Newsweek and the Boston Globe. Currently his work appears on [www.atechnews.com](http://www.atechnews.com), [www.nod.org](http://www.nod.org), [www.business.com](http://www.business.com), [www.unitedspinal.org](http://www.unitedspinal.org), [www.at508.com](http://www.at508.com), [www.eparent.com](http://www.eparent.com) and other websites. His interviewees have included former President Bill Clinton, President George W. Bush, former Vice President Al Gore, former U.S. Attorney General Janet Reno, actor/director Clint Eastwood, former Speaker of the U.S. House of Representatives Newt Gingrich and Microsoft CEO Steve Ballmer. His latest book is entitled Assistive Technologies: Exploring a Universe of Opportunities for People with Disabilities (CTC Foundation 2003). A graduate of King's College, Wilkes-Barre, Pennsylvania, John relaxes by reading French and Latin and historical biographies.

Supporting our interview with John Williams are resources aimed at tracing the evolution of AT. We also feature members of our Knowledge Network. The members spotlighted this month focus mainly on AT evolution and the history of disabilities. We invite you to contact these members for

further information.

Please share this newsletter with other organizations, families and professionals who may benefit from it. We invite you to visit us at <http://www.fctd.info>. We welcome feedback, new members and all who contribute to our growing knowledge base.

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# The Evolution of AT: "This Is....." Assistive Technology"

*An Interview with John M. Williams,  
Veteran AT Commentator and Longtime AT User*

Credited with coining the term assistive technology in a 1982 Washington Post article that he authored, longtime AT writer, author and commentator John Williams regrets that he never copy righted "assistive technology."

"A couple of years ago the hit TV quiz show Jeopardy featured disabilities as a weeklong category. A question about AT stated that assistive technology helps individuals with disabilities and then asked who invented the term. According to Jeopardy host Alex Trebek, the earliest use of the term was in a 1982 Washington Post article. That was the year that I wrote a piece for the Washington Post about a blind user of a talking terminal."



John M. Williams

The article, he recalls, was widely disseminated and read. "Trebek was referring to me," John says, "because the term was never used before I used it in 1982 but has been used ever since." Since then he has used the term in more than 1,500 articles he has written for dozens of publications.

Williams's need for the technology he would name, however, dates back to the 1970s when he gained his initial exposure to it.

## "I Was Embarrassed for Myself"

"In the late 1970s I was the communications director for the American Coalition of Citizens with Disabilities (ACCD). At that time we were the largest civil rights organization representing individuals with disabilities in the U.S. I stuttered severely, very, very severely. I had what's called a 90%-95% stuttering block. Part of my job involved giving testimony on Capitol Hill and to speak before industry groups. I was embarrassed for myself. On two occasions when I gave testimony on the Hill about disabilities I was really bad. In fact, I had to skip much of the testimony."

It was about that time that a friend told John about a program administered by Dr. Jim Hillis who headed the speech-language department at Washington DC's George Washington University. "My friend said Dr. Hillis was conducting some

experimentation that I might be interested in. I subsequently met with Dr. Hillis. He had a robot that resembled R2D2 from Star Wars." The robot spoke, John remembers, but only graphically.

"I was hooked up to electrodes. The robot-produced graphics showed me when I was about to stutter. From that point I was able to follow the build-up. With stuttering, especially if the speaker has severe blocks, the build-up eventually results in an explosion that destroys the block after which the speaker can pronounce the word. Until the block explodes the speaker can say nothing. Sometimes blocks can last 10 seconds and sometimes up to 80 or 90 seconds. I experienced blocks that lasted up to 30-40 seconds.

"As I saw the block forming I'd tell myself, 'If you stutter do it in a relaxed manner. Don't let this block develop so that it becomes explosive.' Sometimes, when I'd have an explosive block, I'd spit, which is common. I also had a secondary symptom: I moved my head forward and backward or from left to right, or I'd move certain parts of my body or I'd bring my fist down on a hard surface. When my fist hit the surface the block broke."

He learned the technique called relaxed stuttering through a form of self-hypnosis, "which I'm doing as we conduct this interview."

When John first met with Dr. Hillis, the GWU professor told him, "John, I think I can help you. It's going to take awhile, as long as a year to 18 months." Dr. Hillis added, "I won't charge you for this therapy if you agree to keep a daily diary for at least two days a week." John agreed to present his diary to Dr. Hillis after therapy was completed.

## "John, I Can't Teach You Any More"

"After about six months my stuttering decreased. After a year it decreased even more markedly. After 18 months Dr. Hillis said to me, 'John, I can't teach you any more. You know a lot about stuttering. You probably know more than any single person I'm acquainted with. Next week will be your final class.'"

Dr. Hillis then invited Williams to speak to a group of about 35 students with whom he was working. "I spoke to the group and it was a good experience for me. That started me thinking, when you stutter as severely as I stuttered before my program with Dr. Hillis, you become extremely fatigued, both physically and mentally. You also become depressed. The worse you stutter, the less others want to be around you."

With the sharp decrease in stuttering John experienced a dramatic change in his physical and psychological well-being. "Those 18 months were the most important in my life in

terms of finding ways to cope with stuttering.”

“Before R2D2 I had blamed every failure that I experienced to that point on my stuttering. That was stupid. As I began to feel better I started accepting more speaking opportunities. I appeared regularly on radio and TV. This was a major transformation for me.”

“Then I asked myself, if a computer can do this for me, what can it do for individuals who have severe disabilities? This was a very empowering tool for me because, surprisingly, I never considered my stuttering to have been a severe disability.”

### Seeking Out AT Manufacturers

With avenues to oral expression blocked early on by his stutter, John turned to non-verbal expression – to writing. “I have been a writer since I was 18. I managed all of the ACDD publications, newsletters and reports. I started seeking out companies that were manufacturing the kind of technology that might benefit others whose disabilities were far more severe than mine.”

He recalls phoning AT manufacturers and announcing, “I’m a writer who has had the benefit of using assistive technology to alter my speech patterns. What do your products do? Can you introduce me to a user?” The companies, he explains, were happy to comply.

“After I interviewed a user I’d phone a major newspaper, the Washington Post, for example, or the New York Times or maybe People Magazine. I’d tell an editor that I had a story idea about a person with a disability who uses a talking terminal, a special phone or any other type of device that helped that person compensate for their disability. I’d ask, ‘Would you like a story?’ The editors, he emphasizes, almost always said yes.

“Every story I wrote seemed to generate many responses. I was able to build my own list of AT users. That’s how I got into this field.”

After his 1982 Washington Post article on AT, John’s writing load steadily increased as his relationships with AT manufacturers and magazine and newspaper editors multiplied.

### Don’t Hype the Product

“I was approached by several companies, including IBM and Maryland Computer Services, which had developed the nation’s first talking terminal for blind people. These companies said, ‘We’ve seen your stories. Would you come and talk to us? We’re trying to get the word out about how our products benefit persons with disabilities and we are running up against a stone wall.’”

“I told them that they had not solved the problem because they had not approached the problem directly in that they were not generating news stories that explained the products’ features. Instead they were making the information in a ‘feel-good’ format.”

Several of those companies hired Williams as a part time consultant to review their products before those products went to market; to help manufacturers refine their marketing programs and find publications that were interested in articles on the uses of their technology and ask those publications if they needed stories illustrating product usage.

According to John, “Most publications said that, yes, they would want those stories but only if the stories I wrote were objective and focused on the products’ strengths and weaknesses. In other words, they wanted a solid user story that did not hype the product. That stipulation was very important.”

### Telling Their Personal Stories

He wrote many stories following that format. “The more stories I wrote the more often individuals with disabilities contacted me to tell me their personal stories.” As a result, late in the 1980s he started a newsletter covering AT and AT-related issues.

“Initially, though, I used the acronym SAINT -- Special and Individual Needs Technology -- to describe the technology in the newsletter. The trouble was, many people were put off by that acronym. So I changed the name of the publication to Assistive Technology News.”

In 1996 Williams wrote an article for Nation’s Business, the magazine of the U.S. Chamber of Commerce. It was a two-part story that dealt with the Americans with Disabilities Act and AT. Recalls John, “BusinessWeek saw the article and liked it. Subsequently, Nation’s Business and BusinessWeek came to me. Each publication told me that it liked the AT field and asked if I’d be interested in writing a regular column.” He elected to go with BusinessWeek Online.

“Every Wednesday my column drew tens of thousands of readers. I wrote the column for 44 months. We won nine awards”.

The column made an impact. In fact, during the 2000 presidential campaign he was the only reporter ever to conduct one-on-one interviews with Vice President Al Gore, former senator Bill Bradley (D., NJ), the current Republican nominee Senator John McCain.(R., AZ) and George W. Bush. When George Bush announced his New Freedom Initiatives program, aimed at increasing access to AT, “95% of the

nine-minute speech he gave announcing the program was directly derived from columns I'd written over the previous several years."

### Aging of Boomers Temper AT Resentment Residue

A major concern for Williams is a persistent ignorance of AT among many U.S. consumers despite a growing body of writing on the topic. Declares John, "AT is not yet as truly visible nationally as it ought to be." For example, he adds, "it is very difficult to persuade television writers to include someone with a major disability in a recurring role." The same holds true in other important sectors of American life, he notes.

Part of the reason for a continuing lack of visibility, he says, "is that most AT manufacturers don't know how to market AT products." Fortunately, he points out, "I think that is changing and the reason is the baby boomers. The change is evident at industry conferences like the one organized by California State University at Northridge. At this year's conference — the 23rd annual Conference for Persons with Disabilities — about 30% of the 138 exhibitors are companies that manufacture low-vision products. That is a growing field and the reason is baby boomers."

Resentment, he says, still exists among many individuals and groups about dealing with people with disabilities. As an example, he cites AARP which for years, he claims, refused to use the word "disability" in its public communications.

Thanks to aging baby boomers, however, the shelf life of such resentments may have reached expiration. Says boomer Williams, "The longer we live the more we will need access to AT. I'm not referring only to individuals but to everyone, to society as a whole. As Americans live longer in ever increasing numbers, we'll need access to it for vision and for hearing and for cognitive purposes, among other reasons. That market is already taking shape."

These technologies, he points out, add to our quality of life. "They also break down historical barriers that prevented, for example, blind people from having access to information and deaf people from communicating to someone hundreds of miles away. There are many, many products on the market that improve opportunities not only for people like me who stutter but also those who are afflicted with other disabilities, like cerebral palsy. Text-to-speech products give these individuals voice."

### Kids' AT Can Be Used by Seniors

This developing sea change in attitude to match the steady emergence of new technology will benefit children with disabilities and their families, John insists.

"The technology used by kids can be used by seniors, too,

and vice versa in many instances. Ideally, though, children should have access to the technologies they need as soon as they are diagnosed with a disability." To increase that access Williams urges the creation of a national database that is readily available to individuals who are connected to the Internet.

"We also need even better cooperation from entities such as Google and Microsoft that provide networks." He acknowledges that both organizations have contributed significant time, money and expertise to the cause of accessibility. "Microsoft does a great deal of work in the accessibility field. Google has a team that works on accessibility networks. The big companies like those two and others will have an increasing impact. In the next 10 years many more people with disabilities will have access to the Internet. Many more people will benefit from that access educationally, socially and entertainment-wise."

Google and Microsoft "see the market," he notes. "They see the numbers. The more people they can provide information to, the more the fortunes of those companies will improve and the more people will return to the networks those companies create and maintain. There are clear business opportunities for those companies. They are very astute companies and they will make the best of those opportunities. The ultimate beneficiaries will be individuals with disabilities and many, many others as well."

### Key barriers to AT's Wider Use

Unsurprisingly, cost, in John's opinion, remains the chief barrier to the achievement of wider AT use and acceptance. "The price range for most AT products is between \$600 and \$7,000, which is high for families and school districts."



The second factor, he adds, is lack of awareness. "I get thousands of emails, sometimes as many as 10,000, each year from individuals seeking information on AT products. Many of those correspondents are parents who feel guilty about having a child born with a disability. Those that do feel guilt are often reluctant to acknowledge that their child has a disability and that the child might benefit from AT."

Beyond cost and lack of awareness, Williams sees a third barrier: ineffective manufacturer marketing. "Too many companies that manufacture these products are not effective at marketing them. They feel that they have their own niches. I tell CEOs, whether their companies employ five people, 50,

100 or more that they need to look beyond the two major markets in which they do business – usually the education and rehabilitation markets – to also include business.”

“These CEOs ought to inform local business leaders that they have a business in their community, this is what the business is and these are the benefits for them, their family members, their colleagues, employees, friends and neighbors.”

### How to Be Smart AT Consumers

According to John, in order for parents, teachers and disability professionals to be smart consumers of assistive technology, they should be aware of the following:

- 1.) That AT exists
- 2.) How AT benefits the user
- 3.) How teachers can employ the technology so it can benefit students in their classrooms.

Schools, he declares, “have to be ready and willing to welcome a child with disabilities to their classrooms along with the technology the child brings with him/her. It’s such a simple concept but there are those who continue to resist it.”



Resistance persists, he observes, in part because special education teacher turnover remains high. “It’s a tough job,” he concedes. “I’ve seen numbers that say that after four or five years of service most special ed teachers leave the field.” Many of the frustrations endured by special education teachers can be attributed, he insists, “to the ways in which school administrations interpret IDEA and how the schools work with parents of students who need AT.”

The irony, he says, “is that the understanding and operation of assistive technology devices do not require a Masters degree in engineering.” Today, he comments, many software programs contain accessibility features. “Unfortunately, companies do not promote these features. I know of hundreds of cases where schools looking for special products had only to look at the accessibility features in the computers they were already using. Had they known to do that they would have found the opportunity to provide benefit to children with low vision, cognitive challenges and other disabilities.”

It doesn’t cost much to add speech capability to a product, he notes. “There are many programs available that are developed by manufacturers whose main market is the blind and visually impaired. It goes back to marketing. Too many consumers remain unaware of these products.”

### Removing a Stigma

The attitudinal stigma attached to AT use is slowly but steadily eroding, he says. “If students without disabilities can go through pre-school, grade school and high school and maybe even college years with AT, that is where the most profound attitudinal changes will occur. The more students who do not have disabilities see how these technologies impact positively on the lives of students with disabilities the more attitudes will change.”

Teachers, he notes, can be part of the solution. “Teachers need to show better leadership in regard to AT use,” he says. That can be accomplished, he states, in three ways: 1.) By changing their attitudes about educating students with disabilities; 2.) By enhancing cooperation and collaboration with parents; 3.) Being more supportive of both special education and general education teachers who instruct children with disabilities.

“I have relatives who are teachers,” he says. “They work with students with disabilities. Often as non-special ed teachers they feel very inadequate because they lack the requisite training they need to be effective at educating students with disabilities. There also seems to be a buzz of antagonism between parents of children with disabilities and their child’s school. That antagonism has to go away. Fully funding IDEA would be a step in the right direction.”

### “There Are Geniuses Out There Who Have Disabilities”

John sees a confluence of AT and educational technology occurring in U.S. general education classrooms that will create opportunities for all children, especially those with disabilities. “It’s underway. In the next 10 years in education we will see educational opportunities improve vastly for kids with disabilities.”

“We’ll see technology improving faster and becoming more and more useful. We will also see a recognition by consumers and by government at all levels that the nation cannot leave millions of children with disabilities behind. I’m optimistic about that. As a nation we need to educate everyone. There are geniuses out there who have disabilities. We need to find ways to unlock their abilities of self-expression.”

Additionally, he says, “there are companies like Canon, Microsoft, HP and IBM that are building accessibility features into their products so that their products can be used by the greatest number of consumers. We will see digital technology exerting greater influence in educating students with disabilities and providing access to information worldwide.”

Within the next decade, he predicts, “We’ll see far more companies speaking up. We’ll see more of AT being used worldwide.” For example, China is taking an increasingly

large role in making sure that Chinese citizens have access to technology, John says.

"Markets will expand. Assistive technology conferences will proliferate. More and more AT-type technology will be employed in a business environment."

Williams hopes to see AT used more in stores like Wal-Mart and Best Buy. "The technology could be used by an employee to work with a customer and also in filling out purchase paperwork. Thanks to technology we'll see more people with disabilities employed throughout society in places of high visibility."

### Autism and AT

Diagnosed autism is growing rapidly as are other disabilities involving communication barriers, John notes. Just a few years ago, he points out, there were perhaps 100 organizations nationwide dealing with autism. Today that number has skyrocketed to 800-900 organizations. "There are many companies that are manufacturing products to help children with autism. Those companies tell me that their most significant obstacle in schools is that schools tell them that they lack the funding to obtain the equipment."

"More and more parents of autistic kids are becoming active in educating their children. Every state now has offices dealing with numerous disabilities. We need to ensure that these state agencies have the money to meet the needs of the people they serve."

### Finding Thomas Jefferson

"One of the great strengths of this nation," says John, "is that we educate the citizens who want to be educated. We need to stress education at every level more than we stress athletics, for example. And we need to find a way to do all of this even at a time when government at all levels is straining to cope with the fallout from the sub-prime mortgage crisis, a nationwide credit crunch and creeping illiquidity, plus rising unemployment, all of which adversely impact revenue inflows to state and local governments."

The lack of access to AT is probably most keenly felt in the nation's underserved inner cities where there are so many individuals with disabilities, John says. "When it comes to disabilities, the African American community is probably the most underserved in the U.S. In the Hispanic community dealing with disabilities, or not dealing with them, is more of a cultural issue."

According to John, the bottom line is that the U.S. sees itself and is seen by others as a country that offers opportunities to everyone. Making that promise a reality, transforming it into a national creed, ought to be our overarching purpose.

"We should say, 'We will educate you. We will give you the opportunities to either succeed or fail.' That creed, that promise, should include citizens with disabilities, especially children. I read that for every 10,000 people with disabilities there is one Thomas Jefferson. In order to find that Thomas Jefferson the potential of millions of kids with disabilities has to be unlocked."

Speaking of U.S. presidents, Williams believes that those who write about them should inform readers about the leaders' disabilities. Building awareness that some of our most respected leaders coped with disabilities would do wonders in creating awareness of and support for AT-related initiatives, he explains. "Americans should be made aware that President Franklin D. Roosevelt governed the U.S. for 12 years throughout the Great Depression and World War II from a wheelchair, that Abraham Lincoln very likely was manic-depressive and that British Prime Minister Winston Churchill, one of history's most stirring orators, stuttered."

They should also know, he continues, that renowned performers like James Earl Jones also work to overcome disabilities. Jones, a stutterer with learning disabilities, collaborates with his wife in following an elaborate ritual that helps him learn his lines.

### A Compulsion to Connect

Today John Williams sees himself as "just a professional writer who tries to get the message out that there are products readily available in the marketplace that can change the lives of individuals with disabilities ranging in age from the earliest diagnosis in infancy to the oldest of old age." To that end, he says, his newsletter reaches individuals in business, government and education, "all the organizations dealing with every known disability."

It was not until his 30s, however, that he felt compelled to connect with others who had disabilities in the hopes of helping them gain access to AT. "After my incident with my second grade teacher I moved to Catholic schools. As far as I knew I was the only person who stuttered at those schools. Later, when I was a senior in college, I went to several job interviews. I had very good grades. I attended college on a merit scholarship. Yet I was told many times by interviewers – and I was very careful to select job interviews where I might be successful – 'You have good grades and an outstanding all-round record but because you stutter our company won't take this interview further.' That happened many, many times."

When asked how his life would have improved, beginning at age eight, had AT been as available as it is now, John replies, "It would have improved remarkably."

Without AT, he recalls, "I felt like an outsider for years. Stuttering, unsurprisingly, was a major detriment to my social life. For example, I did not begin dating seriously until after college. From time to time I have used a product called a SpeechEasy, which helps give me fluency. Unfortunately, the product has limited value because it can't be worn all the time. It's not effective in large crowds. In fact, in crowded areas I can hear people talking 4-5 feet in front of me, enabling me to hear things I'd rather not hear!"

Fortunately, he concludes, "technologies are improving so fast, as is the understanding of various disabilities. The opportunities for children today dwarf those of my youth and the opportunities for children with disabilities 10 years from today, thanks to improved knowledge and the increasing use of AT in the classroom and beyond, will make what is available now seem almost insignificant. The John Williams of today at age eight or nine would be looking at very different prospects than those that were available to me – and that is a very, very good thing."



## RESOURCES

### ARTICLES

#### Discovering the Power of Fluency through Assistive Technology

By John M. Williams

Stuttering Foundation of America (2006)

John M. Williams, a lifelong stutterer and prolific writer since the 1970s, writes about the impact of AT on his and other disabilities, "In 2001, I was introduced to the SpeechEasy. After a week of using it, I returned it to the manufacturer. For me, it had more negatives than positives. It was not the miracle cure for stuttering that I had heard. It felt cumbersome wearing it in my ear. It picked up too many strange noises that were distractions."

"In 2005, I was reintroduced to an upgraded version of the SpeechEasy. This time, the product was molded to fit comfortably into my ear. I was given practice sessions at East Carolina University, where I was taught to care for it. Wearing the SpeechEasy, my daily 10-minute practice sessions occur in the morning and evening. During practice, I read out loud. As I approach a word that I know is difficult, I stretch the vowel sounds before the word. I duplicate the stretching exercise while speaking."

"Also during practice, I use the 'uh' method. When I stop reading to take a breath, I resume reading by using 'uh.' This program increases my fluency in conversational speech, in delivering speeches and in reading."

"I wear the 'In the Canal' version of the SpeechEasy for a month. I warm up by reciting either the months of the year or a prayer out loud. The SpeechEasy resembles a hearing aid, and it emulates choral speech – a phenomenon that induces fluency in people who stutter. The device creates this choral pattern through Altered Audio Feedback (AAF) that consists of a combination of Delayed Audio Feedback (DAF) and Frequency Altered Feedback (FAF)." A stutterer with a 90%-95% block in his youth, Williams' stuttering rate has dropped 80%.

<http://www.stutteringhelp.org/Default.aspx?tabid=471>

### A Catalyst for Technology

American Foundation for the Blind, AFB Access World (2003)

AT pioneer Harvey Lauer is featured in this article highlighting his 36 years with the Veterans Administration center for blinded vets in Illinois. During his long VA stint, Lauer evaluated reading machines and provided feedback on a wide range of AT products still under develop-

ment. In the interview, Lauer draws on his experiences as a tester and a user to describe the products under development in the late 1970s that came onto the market in the early 1980s. He states that these products, as well as the products on the market in 2003, are less than ideal tools for reading. He outlines his concept of the ultimate reading machine, which would incorporate auditory and tactile feedback in order to provide access to a wider range of printed materials.

<http://www.afb.org/afbpress/pub.asp?DocID=aw040203>

### **Legends and Pioneers of Blindness Assistive Technology, Part 2**

By Anthony R. Candela

AFB Access World (September 2006)

The author interviewed 25 AT pioneers over a period of several months in 2003-04. Interviewees included: AT inventors and industry observers Tom Fowle and Bill Gerry, blind engineers specializing in AT products for individuals who are blind/visually impaired; David Holladay, creator of Raised Dot computing and Holladay's wife, Dr. Caryn Navy, inventor of Braille Edit and Megadots; industry leader Larry Scadden; closed circuit TV founder San Genensky; Dean Blasie, creator of Total Talk, the first talking computer terminal; and Saba Hock, inventor of optical computer recognition (OCR) for PCs.

<http://www.afb.org/afbpress/pub.asp?DocID=aw070509>

### **The Assistive Technology Continuum**

National Assistive Technology Research Institute (2007)  
This article describes the range of AT, from no-tech through high-tech. The authors comment, "Too often, when making technology decisions, there is a tendency to start at the upper end of the technology continuum when, in fact, it is better to start at a lower point. For example, when making decisions about a person whose handwriting is difficult to recognize, it is not uncommon to hear recommendations that a laptop computer should be provided that can be taken to various environments in which written products are required (cost: \$1,000-\$4,500). In reality, an electronic keyboard with memory that can be downloaded into a desktop computer later in the day may be more appropriate (cost: less than \$250). Although the student in this example may eventually require a laptop computer, the electronic keyboard may be a better place to start."

<http://natri.uky.edu/resources/fundamentals/defined.html#continuum>

### **History of Microsoft's Commitment to Accessibility**

Microsoft (2007)

For two decades the computer giant has worked to enhance user accessibility. The company's commitment parallels the evolution of AT from the technology's early days in the 1980s through the present.

<http://www.microsoft.com/enable/microsoft/history.aspx>

### **Using AT: Is It Working?**

By Margaret E. Bausch, ED.D., Ted. S. Hasselbring  
Cable in the Classroom (2005)

The authors evaluate the effectiveness of AT in the classroom and offer insight into and preliminary findings from their studies with the National Assistive Technology Research Institute (NATRI) in this article from the Cable in the Classroom publication Threshold. The article provides evidence of the current uses of AT in the classroom, explores the educator's perceptions of AT and notes the evolution of uses as technology changes, the widening concerns about proper training and assessment and possible implications for AT in the future.

[http://www.ciconline.org/c/document\\_library/get\\_file?folderId=30&name=T-Win05-IsATWorking.pdf](http://www.ciconline.org/c/document_library/get_file?folderId=30&name=T-Win05-IsATWorking.pdf)

### **Assistive Technology: Legal Mandate**

By A. Edward Blackhurst

National Assistive Technology Research Institute (2001)

This report is an overview of federal laws mandating accessibility for children and adults with disabilities in schools, the workplace and other venues. The author outlines the history of various discriminations addressed by federal laws and describes the existing laws such as ADA, IDEA, the Tech Act and Section 504 of the Rehabilitation Act.

<http://natri.uky.edu/resources/fundamentals/laws.html>

### **Illinois Student Develops Mind-Computer Interface**

National Instruments Corporation (2007)

In assistive technology a product very occasionally appears that profoundly changes the field and the profession. Recent University of Illinois Champaign/Urbana graduate Michael Callahan, a systems and entrepreneurial major, invented a mind-computer interface called The Audeo that may be one of those rare products. Placed around the user's neck, a sensor device intercepts signals from the brain that control the vocal chords. Once the signals are intercepted, they can be translated into speech. This speech can be used to navigate a wheelchair through directional commands or serve as voice output for an individual who has lost the physical ability

to generate speech. Although in its inception stage, this technology has mass life-changing capability and could serve as the foundation for future AT products. For his invention Callahan earned the university's Lemelson-Illinois Student Prize, which recognizes him for his role in developing The Audeo, a device that may profoundly benefit people with amyotrophic lateral sclerosis (ALS / Lou Gehrig's Disease), Cerebral Palsy, spinal cord injury, and other neurological disorders.

<http://zone.ni.com/devzone/cda/tut/p/id/6130>

### **Disability History: An Important Part of Our Heritage**

National Center for Learning Disabilities (NCLD) (2007)  
This article urges the designation of disabilities weeks at the state and/or federal level in commemoration of the struggle to create federal and state disabilities legislation. West Virginia has already established such a week and a similar effort in Florida is underway. This movement also advocates the institution of disabilities studies in schools during a state's disabilities history week.

<http://www.nclد-youth.info/Downloads/DisabilityHistory.doc>

### **Universal Design History**

Center for Universal Design, North Carolina State University (2006)

This article traces the evolution of universal design from the early 20th century, when the average lifespan for individuals with disabilities was just 47 years, to the present when the lifespan has increased by nearly three decades, to 76 years. The engines of change, the author writes, were two world wars, plus smaller wars, that created "an enormous population" of disabled veterans whose presence helped spur federal disabilities legislation that positively impacted all people with disabilities, including children and their families.

[http://design.ncsu.edu/cud/about\\_ud/udhistory.htm](http://design.ncsu.edu/cud/about_ud/udhistory.htm)

### **Adaptive Technology: History and Resources Overview**

University of Arizona (2007)

According to the authors, "The history of Adaptive Technologies is a long and storied one that serves both as a blessing and a curse. Early attempts of applying Adaptive Technologies to library settings for some bring back bad memories of bulky machines with a tremendous price tag that in many cases were seldom used. This fact has turned many away from supporting modern Adaptive Technology efforts or feeling obligated to offer such resources to what is considered a very small audience. An article published by the ALA speaks to this very attitude." Times have dramatically changed, however, the

article notes. "Early screen readers often came in the form of very large, bulky machinery which consisted of a telephone handset setup that communicated the text. This is better known as TDD/TTY or Telecommunication Digital Devices or Text Telephone designed for the deaf. Braille was often provided through the use of very detailed keyboards that were prone to mechanical failure. So, with such an auspicious start, why should attitudes towards Adaptive Technology change? Simple, because it is the right thing to do, on top of that fact, the advances made in terms of computers in the last twenty years have made adaptive technology cheaper, but also more efficient, streamlined and user friendly. Many within librarianship share this view that Adaptive Technology has become both universal and cost effective at the same time."

<http://www.u.arizona.edu/~cjean/ATPage/ATHistory.html>

## **WEBSITES**

### **Assistive Technology News**

Edited by well-known veteran AT writer John Williams, the publication addresses all aspects of AT via book reviews, editorials, a message board, email alerts, news updates, press releases, objective product reviews and Williams' blog. Articles are published in the following categories: general AT news, children, education, hearing, law, policy and politics, leaders in AT, military/veterans, mobility, open source AT, speech, sports Paralympics and vision.

<http://www.atechnews.com/home.html>

## **EXHIBITS**

### **Tools and Liberties: A History of Assistive Technology and Design in the U.S.**

NEC Foundation; Disability Museum

The NEC Foundation funded the creation of this online museum exhibit exploring the history of assistive technology. This exhibit and its curriculum provide a way for students in grades 5-12 to learn about basic science, technology, economics and disability issues. At the moment, however, only the library portion of the museum is open.

[www.disabilitymuseum.org](http://www.disabilitymuseum.org)

## KNOWLEDGE NETWORK MEMBERS

### The Disability History Museum



The museum promotes the understanding of the historical experience of individuals with disabilities by recovering, chronicling and interpreting their stories. The museum is home to a searchable theme-based digital collection of documents and images related to disability history in the U.S. These artifacts are drawn from public and private collections nationwide and exist as primary source materials in the museum's library. Materials in the library date back to the 18th century and represent all disability categories across the life span. These records illuminate daily life, work, popular culture, local and national political milestones, shifts in visual representation and medical knowledge and the rise and fall of a variety of social movements.

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

### NEC Foundation of America



Founded in 1991 with a \$10 million grant from the NEC Corporation, the foundation funds projects that advance society via technology.

Foundation grants support the development, application and awareness of assistive technology. Of particular interest is Universal Design. The foundation writes, "Our interest includes the science and technology education of young people with disabilities which reflects our conviction that they themselves will lead society to overcome barriers to communication, be they barriers imposed by distance, time or physical condition."

For further information on the foundation, contact:

NEC Foundation of America  
2950 Express Drive South, Suite 102  
Islandia, NY 11749-1412  
Phone: (631) 232-2212  
<http://www.necfoundation.org/>

### Computer/Electronic Accommodations Program (CAP)

CAP provides AT and services to individuals with disabilities, federal managers,



supervisors and IT professionals. The organization increases information accessibility and works to remove barriers to employment opportunities by eliminating the costs of AT and accommodation solutions. CAP was established in 1990 by the Under Secretary of Defense for Personnel and Readiness as the centrally funded reasonable accommodations program for employees with disabilities in the U.S. Department of Defense. Following the National Defense Authorization Act of October 2000, Congress granted CAP authority to provide AT devices and services free of charge to federal agencies that have a partnership with CAP. For further information on CAP, contact:

Computer/Electronic Accommodations Program  
5111 Leesburg Pike, Suite 810  
Falls Church, VA 22041  
Phone: (703) 681-8813 (voice); (703) 681-0881 (TTY)  
Fax: (703) 681-9076  
Email: [cap@tma.osd.mil](mailto:cap@tma.osd.mil)  
[http://www.tricare.mil/cap/About\\_us/index.cfm](http://www.tricare.mil/cap/About_us/index.cfm)

### Technology Resources for Education (TRE) Center

The center is the New York State Department of Education's designated AT and Universal Design for Learning (UDL) resource and training center for parents, educators, classroom support staff, therapists, state agencies and individuals with disabilities. The center provides AT guidelines, information and referral services, site-based and online training opportunities, a demonstration facility, and an AT newsletter. Some services are free, others are fee-based.



For additional information on the center, contact:

Technology Resources for Education Center  
Maywood School  
1979 Central Avenue  
Albany, NY 12202  
Phone: 800 - 248 - 9873 (toll free in New York State;  
(518) 464-6346 (toll free)  
Fax: (518) 464-6353 or (518) 464-6388  
[www.trecenter.org](http://www.trecenter.org)

## Access Technologies, Inc. (ATI)



ATI is Oregon's statewide AT program. The organization provides a variety of AT-related services, including:

- Ergonomic risk assessments
- AT assessments and trainings
- Trainings and workshops
- Dragon NaturallySpeaking assessments for voice recognition devices for keyboard or hands
- Computer access assessments and trainings
- A used AT equipment marketplace

ATI product-related services include device demonstrations, device reutilization and a device loan library.

For more information on AT, contact:

Access Technologies, Inc.

Administrative Offices and Computer Lab

3070 Lancaster Drive NE

Salem, OR 97305

Phone: (800)-677-7512 (toll free, voice/TTY)

Fax: (503) 370-4530

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

[info@accesstechnologiesinc.org](mailto:info@accesstechnologiesinc.org)

## Stuttering Foundation of America



Founded in 1947, the organization provides free online resources, services and support to those who stutter and to their families as well as support for research into the causes of stuttering. The foundation writes that it is "the first and the largest non-profit charitable organization in the world working toward the prevention and improved treatment of stuttering, reaching more than one million people annually." The organization also offers educational programs on stuttering for professionals.

For more information, contact:

Stuttering Foundation of America

3100 Walnut Grove Road, Suite 603

P.O. Box 11749

Memphis, TN 38111-0749

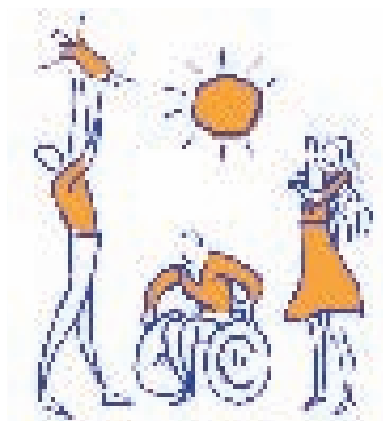
Phone: (800)992-9392 (toll free); (901) (901)452-7343

Fax: (901) 452-3931

Email: [info@stutteringhelp.org](mailto:info@stutteringhelp.org)

<http://www.stutteringhelp.org/Default.aspx?tabid=4>

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