Augmentative Communication News

July, 1991 Vol. 4, No.4

INSIDE THIS ISSUE . . .

UPFRONT

This issue focuses on telecommunications for persons with severe speech impairments. Telecommunications means "*giving or exchanging information over a distance*," and communication by "*electronic or electrical means*."[1] As day-to-day life grows more dependent on information-based technologies, persons with severe communication impairments actually risk falling further and further behind. Consumers, professions, governments and businesses need to consider the telecommunication needs of persons with severe speech impairments NOW. In the United States and Europe, for example, political, economic, and technological changes are affecting telecommunication networks and systems. This will affect access to telecommunications by persons with impaired speech. A window of opportunity exists, but won't be open forever. Thanks very much to people I interviewed *(see list of resources and references)*. As a special benefit to our readers, we increased the number of pages for this issue from 8 to 10. I sincerely hope the issue will raise your awareness (*as it has mine*) and encourage you to become a better informed and active advocate!

For Consumers considers the role telecommunications plays on mainstream opportunities for persons with disabilities. The **Equipment** section examines dimensions of current telecommunication technologies (TTs), *(cont. on page 2)*

For Consumers

Access to communication: Building a power base for AAC in the 1990s

Accessibility is a major issue for people with disabilities. Why? Because physical, social, communication, educational, vocational, economic, and political aspects of society that are not accessible, effectively keep individuals out of the mainstream. Initially, accessibility issues focused on problems facing people with mobility impairments. As a result, architectural barriers came tumbling down. Consider the results! The general public is more aware and accepting of people with mobility impairments. Businesses are benefitting from new consumers using public transportation, going to restaurants, movies, and shopping. Social welfare programs have fewer people with physical disabilities to support because more are working and living independently. Even able-bodied people prefer using curb cuts, ramps, and handicapped stalls in public restrooms. **Just practicing I suppose!** Although physical access issues are far from solved *(just ask anyone who uses a wheelchair)*, societies worldwide are paving a path toward equal physical access.

Communication accessibility is equivalent to architectural accessibility, only instead of a "free flow of people," access relates to the free flow of information exchange.[2] Currently, barriers prevent or limit access to information **going to** and **coming from** nearly all persons with speech impairment. Access issues need to be addressed in:

- Transportation systems (information about times and places of arrivals and departures),

(continued on page 2)

Augmentative Communication News

(UPFRONT cont. from page 1)
then focuses on assistive devices for the telephone. In **Clinical News,** ideas and strategies are suggested to increase mainstream access to person to person communication and information. Take special note of an invited article by Krezman and Williams. The **Governmental** section highlights the World Institute for Disability's Blue Ribbon Panel on Telecommunications, and **University/Research** describes current activities in Europe.

Last month, I attended the Pennsylvania Assistive Device Center conference for AAC consumers, their families and professionals. How exciting to see more than 100 AAC consumers and hundreds of family members sharing success stories with one another! Then, we were off to the USSAAC Annual Meeting and RESNA Conference in Kansas City. The program was excellent; it was nice to see colleagues from around the world. Speaking of terrific conferences, the 5th Biennial Conference of ISAAC (the International Society for Augmentative and Alternative Communication) will be held next August 6-13, 1992 in Philadelphia, PA. This unique event brings together AAC professionals, consumers, and manufacturers from around the world. Start planning your 1992 August holiday! We'll see you there!

Sarah Blackstone, Ph.D., Author

For Consumers (cont. from page 1)

- Community environments (airports, hospitals, shopping malls, banks), and
- Telecommunications, the focus of this issue.[3]

Telecommunications and related technologies play an increasingly significant role in the social, recreational, educational and vocational experiences of nearly everyone. Most households, for example, use at least 3 telecommunication devices every day; schools and businesses often have many, many more. Telecommunication technologies (TT) provide able bodied persons with:

- access to recreational activities and information services, e.g., phone, T.V., radio, computer networks with data-bases and bulletin boards;
- a way to converse with or send messages to people who are miles away, e.g., phone, cellular phones, E-Mail (electronic mail), Voice-Mail, FAX; and,
- distance learning opportunities, e.g., teleconferencing, T.V., radio, videoconferencing.

Access to the same telecommunication options for persons with disabilities are restricted. For example, people with physical disabilities make 1/4 to 1/3 the number of calls in a week as able-bodied persons.[4] Individuals with speech impairments who use AAC devices, boards, signs, gestures may never use the phone.

Solutions are being sought, and some individuals who use augmentative communication aids and techniques are benefitting from increased access to mainstream telecomunications, even those with severe physical impairments. For example,

- Janie, age 28, uses a single switch to operate a computer, special communication software, and a modem. She signs on to a local Bulletin Board (no charge) and has developed a network of friends/colleagues in the community. Some don't know she has severe disabilities.
- Robin, age 8, uses a head mounted light sensor to store messages in her communication device. Then, she asks her mom to call a friend from school. Using a speaker phone, she sets up her weekend activities.
- Hear Our Voices, a consumer group for AAC users, recently held an Executive Committee meeting during a 45 minute teleconference. Five people participated; 4 used voice output communication aids. A minor problem was 3 had the same male voice! Apparently, a top official at AT&T said the conference was a "first," and Gordon Richmond later reflected, "*I enjoyed the historical teleconference we did on July 2, 1991. It was an awesome moment in the history of people with disabilities.*"[5]

Telecommunication options are a means to an end, but not just to conversation and information. Telecommunications are a means to independence, empowerment and equal opportunities.

> "People with disabilities are more at risk of social and physical isolation than most other groups. Telecommunication technologies are vehicles for preventing, reducing and even eliminating that isolation. Telecommunications are an essential component of how we work, do business, socialize, take care of basic needs and engage in the political process. It is difficult to imagine how one might function in society, or even survive, without telecommunications."[6]

Judith Harkins, a researcher at Gallaudet College and actively involved with telecommunications issues for people with hearing impairments, shared the following observations with me:

- the phone truly is an instrument for independent living; and
- when people in the deaf community began to use telecommunications effectively, their power base and advocacy increased exponentially.[7]

Access to mainstream telecommunication technologies is a must for persons with speech impairments if they are to become more independent and begin to set their own agendas . . . AND THEY ARE!

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Equipment

Telecommunication technologies

In an effort to understand the technologies involved and the variety of tasks being accomplished using telecommunications, I asked 3 engineers: Gregg Vanderheiden, Jim Tobias, and Gary Poock, to help me sort it out. Table I illustrates two major dimensions of currently available telecommunication technologies (TT).

Please note: all agree the table will be outdated within the next few years! Digital networks and fiber optics make it possible to send sound, data, and visual information on the same lines.

Type of communication. What kind of communication needs are being met by telecommunications? We broke this down in Table I according to the number of persons involved (**person to person** vs. **group/mass** communication) and the amount of time involved in sending and receiving messages (immediate or **real-time** vs. **delayed**). For example, person to person communication often takes place in "real time" over the phone. However, delayed options now are being used, i.e., leaving a message on a person's answering machine or E-Mail box, which helps avoid the frustrating game of telephone tag. Most mass/group telecommunications (T.V. and radio), on the other hand, are "delayed" (i.e., broadcast after the fact). Stay tuned . . . more interactive forms of group communication are already here (e.g., teleconferencing, videoconference, home shopping).

Type of technology. What kind of technology is being used? Table I categorizes TTs as follows: **audio-, character-, visual-, or audio/visual-based.** Each type of TT provides exciting options for some people, but precludes others from using it:

Audio-based. (*Requires ability to hear and understand speech; and physical and cognitive ability to operate equipment*). Audio-based TTs are the oldest and most common form of telecommunications. Future developments benefitting people with disabilities are likely to be in speech recognition and synthesis, and in the use of simultaneous auditory explanations of T.V., videos, and graphics (SAP).

Character-based. (*Requires ability to generate and read characters/text; and ability to access and operate equipment*) Telecommunication Devices for the Deaf (TDDs) are character based and used by some people in the hearing impaired community, but few AAC users.

Person to person and person to group/mass telecommunication using computers has grown exponentially. The "computer world" is full of opportunities to learn, work, play, socialize, shop, bank, and so on for able-bodied people and persons with disabilities. The key to this "computer world of telecommunications" (still undiscovered by many) is a modem. That's the good news.

The bad news is people who do not read or write text and who rely on visual communication (i.e., signers, symbol users) can not access this "world." Although some communication devices translate graphic symbols into text, translation of most visual information into text form exists only in research labs. *(continued on page 4)*

Table I. DIMENSIONS OF CURRENTLY AVAILABLE TELECOMMUNICATIONS*

*** Developed in collaboration with Gregg Vanderheiden, Jim Tobias, Gary Poock**

	TYPE OF TECHNOLOGY			
TYPE OF COMMUNICATION	**AUDIO - BASED**	**CHARACTER - BASED** (ASCII, BAUDOT, other protocol for transmission/reception of alphanumeric characters)	**VISUAL - BASED** (Graphic capable)	**AUDIO/VISUAL- BASED**
PERSON to PERSON- REALTIME ("chat," conversation, emergency, information)	Telephone; Cellular phone; 2-way radio,	Computer: on-line, real time "written" conversations on Network; TDDs using Baudot or ASCII	Video telephone (using video only)	Video telephone
PERSON to PERSON- DELAYED (messages, information exchange)	Answering machines; Voice mail	Text-based answering machines, including TDD; Character-based messaging systems, including e-mail; messaging on bulletin boards; networks	FAX; Graphic-based Networks (e.g., Prodigy)	
GROUP - REAL TIME (conferences/ discussions)	Conference phone calls; Radio (Talk shows); Audio teleconferencing	Computer conferencing on some networks	Video conferencing (video only, i.e., sign langauge telephony)	Standard videoconferencing
GROUP - DELAYED	Radio; Auditory explanation of video and TV (SAP); Audio text services (e.g., newspaper)	Bulletin Boards; Computer discussion groups/digests.	Captioned video (T.V. or tapes), Graphic-based networks.	T.V.

Note: Exchanging information across distances includes sending and delivering information by mail (e.g., text, graphics, Braille, audiotapes, video tapes, disks). Neither received nor transmitted across distances "electronically," these are not included. See definition of telecommunications page 1.

Visual-based. (*Requires seeing and understanding message form, e.g., graphics, video; and physical and cognitive ability to operate equipment).* Visual-based TTs are capable of generating, storing and transmitting graphics, pictures, and video. FAX and graphically-based computer networks are currently the best known examples. Because of the demand for broad band networks and the movement toward an Integrated Services Digital Network (ISDN) as a standard, graphics capabilities will be increasingly possible. While this creates new barriers, and is of great concern to persons with visual impairments, visual-based technologies may offer persons who use symbols and sign language access to telecommunications for the first time.

Audio-visual based. (*Requires ability to see and hear message form; and physical and cognitive ability to operate equipment*). A multi-modality approach to information exchange has broad mainstream appeal. Just consider the T.V.s and video players in use around the world. Technology permitting interactive audio-video access is still limited. However, distance learning opportunities exist at many universities. Future possibilities include off-site supervision of professionals in training, assessments over distances, and supervision of people with disabilities from a distance. These options increase home care possibilities for elderly, as well.[8]

ASSISTIVE DEVICES FOR THE TELEPHONE

This section focuses on use of the telephone by people with severe speech impairment, who may have multiple disabilities. Currently, "there is little available (for this group) that will permit useful and private communication over the phone."[6] Manufacturers. . . .!!! Examples of options are:

For handling the receiver & dialing

Kid picture dialer. For young children and persons with limited cognition. Also permits rapid dialing in case of an emergency. Picture of person or a symbol is placed on a switch. When touched, it dials a preprogrammed number. Available in some toy stores and catalogues.

Headsets. For persons with some speech who have difficulty holding the phone

Large button phones. For sight-impaired

Unidialer II. For single switch phone dialing (scanning and switch closure are adjustable). Numbers can be stored.
TASH Inc. 70 Gibson Drive, Unit 12
Markham, Ontario L3R 4C2, Canada.

For transmitting messages

Amplified handsets. For soft voiced speakers.

Artificial larynxes. After surgery.

Speaker phones. Can amplify speech. Can be used when speech impaired person is using an interpreter. Can be used with voice output communication devices.

Magnetic tape (e.g., Language Master). Messages recorded on cards. Different message sequences (ordering pizza, asking for movie information, talking to Grandma, calling an emergency number...911) can be stored in a card file near the phone.
Mini-card Reader. Crestwood Co., 6625 N. Sidney Place, Milwaukee, WI 53209, USA

Loop tapes. Can give emergency messages. Can get a conversation started.

For dialing and transmitting messages

MultiVoice™ (Portable DECtalk™) The DECTalk allows users to dial any touch-tone phone by generating DTMF tones from the speaker into the phone receiver. It then resumes voice output for the phone conversation. Institute on Applied Technology, Children's Hospital, 300 Longwood Avenue, Boston, MA 02115.

BBS Infra-red controlled speakerphone. Allows user to answer incoming calls, dial the operator for outgoing calls, hang up. It plugs into single phone line and can be controlled with a variety of infra-red devices or by any two switches. Its built-in IR transmitter will train IR control devices. Customized multi-line adaptations available. Baylor Biomedical Services, 2625 Elm Street, #102, Dallas, TX 75226 USA

TDDs (Telecommunication devices for the deaf). Equipped with a "keyboard, screen, printer, acoustical telephone coupler, and a power adapter." Messages typed on one TDD instantly appear on the screen or printer of another TDD when the machines are connected by ordinary telephones. TDDs evolved from old teletype machines (TTY) that used Baudot, a code incompatible with the standard code ASCII used by computers. Today, a dozen or so TDD products offer ASCII, but most deaf people still use Baudot.[9]

The Hayes TDD. Designed to allow people to use home computers to communicate with others by telephone using ASCII code. Makes a home computer act like an ASCII TDD. Does not communicate with TDDs using Baudot code. IBM-PC compatible and Hayes-compatible modem needed. Available for $3 US from: Technology Assessment Program, Gallaudet University, 800 Florida Avenue, N.E., Washington, D.C. 20002. Specify 5/14" or 3 1/2" disk.

Clinical News

Strategies for using telecommunications

This section has a potpourri of strategies to consider when using telecommunication aids and techniques. Strategies cover use of voice output communication aids, relay systems, bulletin boards, and ways to teach people with limited experience. Take special note of how Michael and Carole handle "interpreter" issues *(in general)* and telecommunications *(in particular).*

USING VOICE OUTPUT COMMUNICATION AIDS OVER THE PHONE[10]

1. Consider using the telephone as an initial teaching context. It demonstrates the real value of a voice output communication device. Users simply can not rely on visual forms of communication!

2. Speed is a big problem. Silences are forbidden particularly at the beginning of a conversation. People will hang up. Be prepared!

3. For physically disabled users, it may take time to switch from dialing to the communication device.

4. Prepare an introductory message, something like,

> "Hello, please don't hang up. This is ___ calling. I have difficulty speaking so I am using a _____ to talk with you. Can you understand me?"

5. Use a speaker phone. Be sure volume is adjusted.
Note: more volume does not mean more intelligible. Be sure to ask listener if they can understand the speech being generated.

6. When preparing messages in advance, use redundant information. For example,

> Say "Yes that's right" instead of "yes." and "I'd like some french fries" instead of "fries."

7. Just in case, have a variety of preprogrammed phrases ready, e.g.,

> "Be patient I must spell that."
> " Whoops I made a mistake."
> "I 'm limited in what I can say."
> "If you ask me yes/no questions, I can respond more quickly."
> "It takes me a few minutes to prepare an answer, can you wait?"

TEACHING PEOPLE WITH LIMITED EXPERIENCE OR COGNITIVE IMPAIRMENT TO USE THE PHONE[8,10]

1. We should keep in mind that children, persons with limited experiences, and those with language and cognitive delays:

- May never have been introduced to the phone.
- May not understand they can not use visual methods on the phone.

Note: It is typical to see individuals shaking their head and gesturing while talking on the phone, expecting to be understood.

- Will probably have difficulty changing old patterns of communication.
- Will improve with practice. Using the phone is a skill that can be, and needs to be taught.

2. Steps involved in teaching adults with cognitive impairments to use the phone may include:

- a. Teach the individual that using the phone "costs" something, e.g., von Tetzchner[8] began by using a pay phone.
- b. Teach phone etiquette, i.e., how to ask for people, how to end a conversation, and so on.
- c. Instruct the person when it is (and is not) appropriate to call someone.
- d. Provide examples and experience with the kinds of tasks accomplished using the phone.

3. As with any other training program, plan vocabulary in advance and practice specific, functional phone situations (*call a Taxi, invite a friend over*) using familiar partners first, then those unfamiliar.

USING A TELEPHONE RELAY SYSTEM[10, 11]

Persons with hearing and speech impairment who have minimal typing ability and literacy skills can communicate with other people who have a TDD. TDD recipients often receive reduced per-minute long-distance telephone charges because transmission takes longer than voice transmission of the same message. Most hearing impaired people do not have TDDs because they can not use them or they do not meet their needs. For example, most people with hearing impairments are over 65 and want to use their speech. TDDs rarely meet the telecommunication needs of persons with speech impairment. Currently, dual-party relay systems are being developed to allow phone access for speech and hearing impaired users. The California Relay System (CRS) is an exemplary example. Financed by a .03 percent surcharge on all intra-state long distance calls, it is free to all persons with speech and hearing impairments. It is administered by AT&T (soon by SPRINT) under an agreement with the Deaf and Disabled Telecommunications Program, a subsidiary of the California Public Utilities Commission. The CRS handles over 265,000 calls per month; only 2-3 percent of calls are made by people with speech impairments secondary to cerebral palsy, ALS, cancer. To address the needs of most consumers, relay systems are beginning to offer "voice carry over" and "hearing carry over." This permits hearing-impaired users to speak to their callers and speech impaired users to listen to their caller's voice. Relay operators currently receive training in issues related to Deaf culture and relaying information for deaf users. They are rarely familiar with issues related to non-speakers who hear and use AAC. We need to develop protocols for relay operators!

Julie Gamradt[10] at the Trace Research and Development Center is directing a project *Optimizing Telecommunication Access for Persons with Severe/Multiple Disabilities*. Goals are to identify issues and potential solutions and develop more technical options for persons with severe and multiple disabilities. In the meantime, relays do offer an option.

USING A BULLETIN BOARD[12,13]

Bulletin Boards (BBs) put information and messages "up" electronically for people who "sign on." Local BBs are often free, while national/international BBs may have a standard per hour usage fee, higher during prime time. Equipment needs include a standard computer, modem, terminal software, and a telephone. The total cost need only run $500 US or so for a used computer system like this.

- BBs increase interaction options. For example, those living in rural areas (e.g. Ayres Rock in Australia) communicate with others (in England.)
- BBs are faceless. They allow individuals to interact without their disability if they so chose.
- BBs provide access to world knowledge. Can communicate with others living in different countries.
- BBs encourage social growth. People can interact with others in ways not possible during face to face communication. For example, at the University of Connecticut a professor signed on to a Bulletin Board for young teenagers as Mysterious Mell from Mars and asked to talk to some Earthlings. He pretended not to understand terms such as stepsister, handicap etc. Discussions quickly got beyond the boundaries of overprotective families and professionals.
- BBs encourage the development of literacy skills.

Disadvantages of BBs are: the indefinite costs, issues of trust and control, inability of those who can not generate text to "sign on", and lack of interconnected networks.

To get started, first get oriented! Next, install a modem in the computer. If you have problems ask for help. Then, go to your local computer store and ask for a list of local Bulletin Boards. Sign on to a free Bulletin Board (it is easy). You'll find lists of others. Good introductory materials are listed on page 10.

If you can pay $10-15 per month for a commercial service, as mentioned in the next article, you can then send electronic mail over thousands of miles, read newspaper headlines, order airline tickets or flowers for a friend, use an encyclopedia, and get stock market prices. These services are a reality today. They can be for you and for those unable to speak!

TIPS AND TECHNIQUES FOR TALKING ON THE TELEPHONE (T^4)
(Interpreter Issues)

by Carole Krezman and Michael Williams

Michael lives with his partner Carole and son in their home in Berkeley, California. Michael uses various forms of communication to express himself: a Voice Output Communication Aid (VOCA), a letterboard, computer written notes, speech, and speech with an interpreter. He also has different kinds of telephones for different purposes: a standard telephone, a TDD, a speakerphone, and a headset phone. Michael and Carole have worked out some techniques for using the telephone, which are described below.

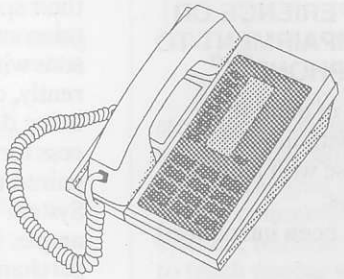
Given the attitude toward disability in our culture most interactions, even friendly ones, require asserting and reasserting Michael's power and authority as a communicative equal. This is particularly tricky when using the telephone. Sometimes Carole acts as an interpreter for Michael's phone calls. We have developed some procedures which usually work well for us. These telephone techniques have evolved over the years and are still changing, but this is how they stand for now.

Role of Interpreter

It is very difficult and yet crucial for Carole as the interpreter to keep out of the telephone conversation. There are times when she could clarify meaning or add data to the conversation which would be helpful. But stepping out of the role of interpreter takes the phone call away from Michael.

When Carole is interpreting for Michael, she identifies herself by her first name and says that she works for Michael Williams or that she is his interpreter. Whether Carole is Michael's friend, wife, social worker or mother is specifically not mentioned. Carole uses only her first name to help establish that Michael is in charge of his end of the phone call. We try to force the person on the other end of the line into seeing Carole-the-interpreter as subordinate to Michael. Another benefit to giving the interpreter's first name only is that it keeps her name off of forms when dealing with bureaucracies. Computers always need a last name. It also discourages people from returning calls to her. The calls must be returned to Michael. Carole tries to be as flat as possible: a non-person. There are two people on the phone, and Carole is not one of them.

Carole usually implies that the need for the interpreter is the listener's need. "*I am here in case YOU have difficulty understanding Michael.*" It helps to set up the balance of power. We want it to be clear who is perceived as lacking in communicative ability: the listener.



Standard Phone

When Michael receives a phone call from a stranger, we use a regular telephone. The messages are usually short and Carole asks the caller to hang on while she tells Michael. Then Carole makes sure the telephone mouthpiece is close enough that the caller can hear her repeat accurately the message without editorializing. We try to give proof that the reply is coming from Michael, either by the sound of his voice or VOCA in the background, or by Carole voicing the letterboard as she reads it. This way the message appears to be emanating from somewhere other than Carole.

For some calls, Michael gives Carole a script. Carole says "*Hello, I'm Carole. I work for Michael Williams. He asked me to tell you this.*" Then she reads the script. If there is any discussion she just keeps repeating the message. "*Well, it says here ....*" This is good when the phone call is merely a message. It is also effective when the person on the other end is likely to argue and Michael has already made up his mind and isn't interested in discussing the issue/topic any further. It is also a good technique when Carole personally objects to the content of the message. It makes it clear to both Carole, and the person on the other end of the phone, that she is only the messenger.

For long conversations on a regular phone, we can usually build up enough of a rapport to get the other person to pause for a second between their phrases. If Carole puts her hand over the telephone mouthpiece, she can repeat what is being said to Michael three or four words behind the speaker. The speaker hears her mumbling through her fingers. This "mumbling" allows the caller to know the message is getting through to Michael. It also signals the caller to talk more slowly. Although Carole can't concentrate on the meaning of words when she is simultaneously interpreting a conversation, it doesn't matter because it is not her phone call.

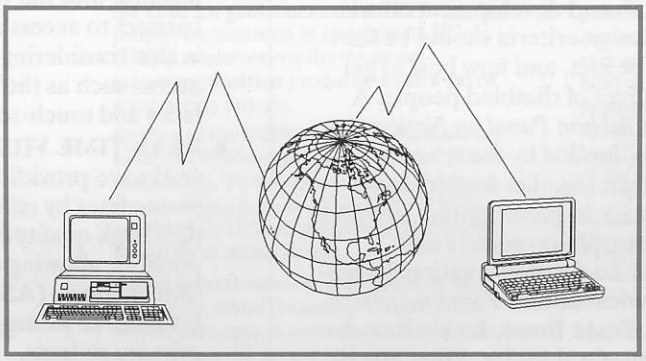
If Michael isn't going to need to say much more than "no" and "okay" to a good friend, he uses a regular phone without an interpreter. Michael doesn't like to do this very much because he doesn't like to be linguistically muzzled.

Our newer phones each have a mute button, which turns off the mouthpiece so the person on the other end cannot hear us talking. This can make it easier for some

callers since hearing Carole mumbling right along with the caller, can be distracting for some people. On the other hand, some callers like to hear a lot of verification (*"mhm," "uhhuh," "yeah"*) while they are talking and will stop talking when the mute button is on. Other people are quite content to talk into a void as long as Carole flips the mute button off at each pause, when she is ready to respond.

Speakerphone

We also use a speakerphone. Michael can be more independent on the speakerphone. When he is using an interpreter, the interpretation is only one way. With a speakerphone, he can hear first hand what is being said to him. If he is using a VOCA, he can often do without an interpreter. Other times people need to have the VOCA translated. However, if they hear the VOCA, they may learn to listen to it eventually. The main function with the speakerphone for an interpreter is to be a traffic cop. Since there is a delay between pushing the VOCA's "talk" button and when the talking begins, and because people often won't shut up, Michael cues Carole to interrupt the speaker as he or she takes a breath and say, *"Michael would like to saaaay....."* This gives the VOCA time to kick in. With the speakerphone Michael has to put less energy into establishing that he has control over his side of the conversation and is a communicative equal to the person on the other end of the line.



The speakerphone has some disadvantages. When other things are going on in the house, it can be hard to hear the speakerphone. The person on the other end of the line may incidentally hear other people in our home talking. Also, everyone in our home can hear the call. Sometimes the conversation is changed by the lack of intimacy. Our particular speakerphone is one that doesn't allow talking over each other like a regular phone so we can't interrupt or laugh or make verifying noises on the speakerphone when someone is talking to us or we can't hear what the caller is saying. It can make people nervous to use a speakerphone.

TDD

Michael uses a TDD to talk to deaf friends and sign language interpreters. However, he types quite slowly so other communication devices are generally more effective than his TDD.

Answering Machine

In addition to the various telephones, we use the answering machine as a filter. People can call and leave a message for Michael to call back. Then he has time to gather his equipment and prepare a response without time pressure, or to find an interpreter or program his VOCA if he has a lot to say.

Audio Tape

Michael developed an ancient, yet still viable technique using an audio tape. The tape has been recorded with a message that gives his name and address and asks that Michael be picked up in a half hour. This works well for the taxi company. The dispatcher says okay and Michael hangs up. This technique is suitable for periodic calls that require no discussion. It might work for 911 emergency calls too if one has the presence of mind to work the tape-recorder in an emergency.

Electronic Mail

What Michael wishes we could do more of is E-Mail. We subscribe to an on-line service for our personal computer. Michael likes the format very much because he can use it the same way anyone else can. He can write a quick note to someone and put it in his/her "mail box" many places in the world. When the recipient of the message turns on his/her computer, a message will flash that there is mail waiting. Electronic mail is a viable alternative for some, but not all, types of phone calls.

We could use E-Mail more if everyone we wanted to talk with was on the services we use. Various services (Prodigy, America On-line, Compuserve) don't interconnect, so we can only send messages to the people who have chosen the same on-line services. Other frustrations are that some friends can not afford subscriptions services; and others who can, aren't taking advantage of the communication possibilities electronic mail offers.

Summary

Telephone communication is complicated. There are many kinds of phone calls and various relationships with the people we call. In order to have success, we have analyzed our interactions over the years and tried to learn what special strategies make people we talk to comfortable. We are trying to learn why we do what we do in order to know how to adapt it. It is just a matter of trial and get better, and of listening to ourselves to know what works for us and what doesn't.

Governmental

WID's Blue Ribbon Panel on Telecommunications in the U.S.

The Americans with Disabilities Act of 1990, together with other legislation (e.g., *the Technology Assistance Act, the Rehabilitation Act and the Individuals with Disabilities Education Act*) have put manufacturers, businesses, educational systems, government agencies on notice in the U.S. to find ways to provide persons with disabilities access to telecommunications. Those with speech impairments are even singled out!

The World Institute on Disability (WID) is a research, training and policy development center operated by persons with disabilities. In technology policy areas, WID has a goal of empowering people with disabilities to determine where research and development efforts should be directed, what design criteria should be followed, what needs should be met, and how best to get useful technology into the lives of disabled people. A two-year project, *The Blue Ribbon Panel on National Telecommunications Policy*, funded by the telecommunications industry, brought together leaders from major disability constituencies, representatives from the telecommunications industry, policy-makers and telecommunications experts to develop a national agenda and make policy recommendations. Panel members include: Lars Augustason, Frank Bowe, Jackie Brand, Dale Brown, Judith Harkins, Oral Miller, Mike Morris, Tom Shworles, Al Sonnenstrahl, Max Starkloff, Rocky Stone and WID staff, led by Deborah Kaplan. The First Year Report of the Blue Ribbon Panel soon will be available, summarizing progress during Year 1:

- **ACCESS TO DIRECTORY SERVICES.** Current policy restricts a directory assistance operator from providingYellow Pages information. This means some people (e.g., those with visual, physical, cognitive and language impairments), who can not use a heavy phone book or read small print, don't have access to that information.
- **DUAL-PARTY RELAY.** Some states have relay programs in place; others do not. The panel investigated how programs are being administered and to what extent consumers are involved. Because of the expense of relay services, a discussion regarding the possibility of network solutions also was begun. Title IV of the ADA specifies a national relay system be in place by 1993 for persons with speech and hearing impairments.
- **ADAPTIVE EQUIPMENT FOR TELECOMMUNICATIONS.** Inequity exists among the 50 states. The panel concurs that people, including those with disabilities, should have equivalent access to the phone at an equivalent cost. While about half the states provide individuals with a TDD or amplified handset, others provide nothing. To my knowledge, California is the only state that has provided equipment to meet the needs of persons who have disabilities other than the deaf (TeleBraille machine; electrolarynx).
- **ACCESS TO EMERGENCY SERVICES.** Access in remote, rural areas is a problem for everyone, including people with speech impairment. There is TDD access to 911, but that won't help most AAC users. Enhanced 911 access (i.e., the dispatcher has a drawing of the house, description of the needs of people who live there, etc.) is becoming available in some areas.
- **VOICE PROCESSING** and **VIDEOTEX.** Access to public terminals and information service systems is increasingly becoming a concern. "Access" requires consideration of issues related to keyboard, voice output, software, preferability and ease of use. Recommendations include providing a pass back to ASCII and more than 1 way to get information in and out. The panel is exploring the possibility of co-sponsoring a meeting with the voice processing industry to explore barriers to access and potential solutions together. It is also considering a panel presentation on barriers to access such as the increasing use of graphic user interfaces and touch-screen controls.
- **REAL-TIME VIDEO.** Technology advances in the networks are providing access to high quality video over phone lines by compressing signals or using fiber optics. High quality images from home to home will be possible, allowing deaf people to converse in their own language (ASL); and those who use other visual systems the means to communicate using their primary systems.
- **STANDARDS.** The Panel met with the T1 Committee, an Industry wide standard setting body. The Panel feels it is essential to have members sitting in on meetings as standards are written.

The agenda for Year 2 of the project will be decided during an upcoming video conference. Among the topics being considered are:

- Upgrading TDD's
- Building intelligence in the network vs. in the home/on the desk
- Cost issues (funding relay systems, equipment distribution, computer equipment giveaway/discount programs)
- Universal design as a concept, telecommunications as the application and
- Industry's relationship to the disabled community.

After Year 2, a final report containing policy recommendations will be published. In looking toward the future, Kaplan[14] points out that laws are currently based on a premise that people go places to do things. This assumption fails to account for the fact that people today use the telephone to do business, shop, bank, play, and live independently. To provide access to telecommunications, we don't have to use a jack hammer, i.e., we don't have to cut curbs. Access means that developers and manufacturers have to change algorithms and/or add features that build in phone access. Access also means we must all change our assumptions about who the phone *(and other aspects of telecommunications)* are for.

For additional information, contact Deborah Kaplan, WID, 510 Sixteenth Street, Suite 100, Oakland, CA 94612.

University & Research

European Projects

People from more than a dozen countries in Europe, who speak different languages and come from different cultures and socioeconomic systems, have been cooperating for more than 5 years to solve telecommunication problems faced by persons with disabilities. While research goes on at a national level, several wide-based forums currently exist. These influence and inspire substantial research and are instrumental in making national projects international.

1. COST 219 (European Cooperation in the Field of Science and Technical Research Project): **Future Telecommunication and Teleinformatics Facilities for Disabled People**. 17 countries and the Council of the European Communities (EC) aim to:

- 1) collect information about existing telecommunication and teleinformatics aids and services,
- 2) collect information about ongoing research and development appropriate to disabled people,
- 3) inspire and coordinate research, development, and other activities in this area.
- 4) survey practical needs of disabled people, and
- 5) evaluate future possibilities of information technologies.

In the first phase of the project, working groups produced a survey of services, identified practical needs of persons with disabilities, considered future telecommunications and teleinformatics possibilities and problems, and collated information on amplification and coupling systems. A book Use of telecommunication: The needs of people with disabilities[15] covers current barriers to telecommunication faced by persons with various impairments. Activities in phase 2 of COST 219 included reference groups and research projects:

Reference Groups.

Standardization: B. Lindstrom, Chair (Sweden). To set up contacts to standardization bodies like ETSI; analyze standards from the perspective of disabled users; make comments as appropriate.

Equipment, services, research: J.H. Skjetne, Chair (Norway). To decide on possible standard forms for collecting data; update surveys of services, aids and research collected in Phase 1; collect information about non-participating countries.

User characteristics and social aspects: J. Frederiksen, Chair (Denmark). To describe user groups and needs for technical solutions; study user behavior and get feedback from users; maintain contacts with relevant groups.

Future telecommunications and teleinformatics technology: R. Puig, Chair (Spain). To study consequences of new services and possibilities concurrent with technological developments.

Cooperative Research Projects.

Influencing the design of equipment and services: K. Olesen, Chair (Denmark). To promote awareness and understanding of the need for guidelines on behalf of disabled people, for inclusion in appropriate EC (ETSI) minimum requirements on telecommunication products; make a list of good design criteria.

Studies of the ISDN and IBC terminals on behalf of disabled people. G. Klause, Chair (Germany). To investigate terminal designs from national projects, Handynet, RACE etc.; provide links to standardization bodies for ISDN terminal design.

Social aspects on communication. S. von Tetzchner, Chair (Norway). To record and monitor changes in communication patterns among disabled people and compare to changes in society.

Remote text communication for deaf, deaf blind, and speech impaired people. R. Besson, Chair (France). To study intercommunication problems in European countries and suggest solutions.

Picture communication: P. Reefman, Chair (Netherlands). To study video telephone transmission of lip reading, sign language and symbol language, the synergic effect between sound and images, and consider broadband and narrowband transmission in cooperation to related projects.

Access to visual presentations for visually impaired people. P.L. Emiliani, Chair (Italy). To study methods of accessing pictures and graphics on various displays; develop a handbook.

Alerting system for emergency alarms for people who are deaf or hard of hearing. J L Lindstrom, Chair (Sweden). To design an alerting system for emergency alarms.

COST 219 was recently approved for a 5 year extension. A book edited by von Tetzchner, Issues in Telecommunication and Disability[16] will be available at no or minimal cost in October.

2. **RACE (Research into Advanced Communication Equipment in Europe)**. This program of the EC funds several application studies in the area of telecommunications.

Integration of people with special needs into broadband communications (IPSNI). Participants from Italy, Greece, The Netherlands, Finland, Scotland. Contact person P.L. Emiliani. To produce specifications for ways to integrate people with visual/ motor/speech disabilities into the multimedia communication network; allow individuals access to multimedia retrieval systems (teleshopping and telebanking), information services, electronic mail services and interpersonal communication; produce a standard reference manual of specifications for terminal designers to ensure accessibility, either directly or by modular adaptations for all users of European IBC terminals.

Application pilot for people with special needs. Participants include Germany, Italy, Portugal, Sweden, and Finland. Contact person J. McEwan. To demonstrate types of commercially viable support services in the care sector using videotelephony for elderly, hard of hearing, visually and mobility impaired persons. Emphasis is on defining needs, designing and testing user system interfaces and making social services aware of the role telecommunications can play.

3. **Concerted Action of the European Community: Technology and Blindness.** P.L. Emiliani, Project leader (Italy). Addresses the use of graphics on visual displays (that preclude existing speech synthesizers from reading out the screen.) Special purpose technology and adaptations of general purpose technology will be developed. For example, projects include:

Graphics and iconic man-machine interfaces: To develop approaches for multimedia man-machine interfaces and for the adaptation of existing products.

Digital newspaper project: Text from a paper's computer can be broadcast via radio or television to blind people's homes, decoded and stored on a PC hard disk. Person can "read" paper using a speech synthesizer or transient braille display. Also useful for dyslexics or physically disabled.

To summarize, Europe is playing a leadership role in the area of telecommunications for those with disabilities. When national agencies, manufacturers, designers, scientists, administrators, politicians and professions cooperate, people benefit!

For additional information on projects, contact persons or to order either book, contact Stephen von Tetzchner, Senior research psychologist, Norwegian Telecom Research Department, P.O. Box 83, 2007 Kjeller, Norway (+47-6-80-9158. FAX (+47-6-81-0076)

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