Augmentative Communication News

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For Consumers
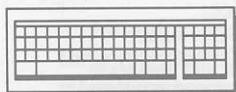
Training issues Part II:
Operational competence

UPFRONT

Communication devices are <u>not</u> <u>appliances</u>[1] like a TV, stove, or toaster.[1] You can't turn on a communication device and expect it to carry on a conversation or write a letter. Communication devices are <u>not toys</u> either. They are sophisticated and expensive and not really designed to be entertaining. Communication devices are <u>tools,</u> a means to some end. Like other tools (a hammer, computer, sewing machine), users must develop skills in order to operate them. Communication devices may also be likened to <u>musical instruments</u>. I particularly like this analogy because it captures the art, as well as the science of communication. Some communication aid users be-

come maestros and leave me breathless with appreciation of their artistry, knowledge and skills.

This issue is about teaching people to operate communication devices. Operational competence involves proficiency of AAC system use (e.g., turning it on/off; understanding its features and functions). While <u>never</u> the end goal, it is a very important step along the way to communicative competence.[2] **For Consumers** considers the increasing need for training and provides suggestions from two expert AAC users. *(cont. on page 2)*

[2] Light defines communicative competence as a relative and dynamic, interpersonal construct based on functionality of communication, adequacy of communication, and sufficiency of knowledge, judgement, and skill in four interrelated areas: linguistic competence, social competence, strategic competence, and <u>operational competence</u>.

An increasing number of people are needing to learn to operate AAC (augmentative and alternative communication) equipment for the following reasons:[3]

- 1. Among persons who use AAC devices, only those who understand the features and basic operation of their device can concentrate on the complicated task of communicating.

- 2. AAC services are being more equitably provided. Thus, staff in nursing homes and hospitals, job coaches, and personal attendants are being asked to learn about assistive technology.

- 3. Professionals and caregivers need to understand AAC device operation so they can provide support to users, and

- 4. The integration of AAC users into educational systems, the community, and work place increases the need for instructing able-bodied people.

In fact, more non-disabled individuals than AAC users require instruction in the use of AAC devices. For example, Beukelman[4] reported 16 non-disabled individuals had been taught basic device operations for one student by the time she reached the 4th grade.

Those interviewed see operational competence as a gradual process, probably occuring in phases. Phase I may involve becoming aware of the AAC device, its features and functions. Phase II may comprise learning basic operations and their applications. Phase III may encompass increasing the level of expertise across applications and achieving automaticity. Similar to developing other complex skills, this process requires time and almost always involves extensive intervention.

A good analogy may be learning to play a piano. While Phase I may simply involve exploration (i.e., banging on the keys), Phases II and III require practice and ongoing instruction. Would you *(cont. pg. 2)*

(UPFRONT continued from page 1)
The **Equipment** section examines the important role manufacturers play in training operational competence and suggests ways to take advantage of opportunities they provide. Before reading **Clinical News** you may wish to review March issue's discussion about how adults learn. This issue focuses on learning about technology. **Governmental** looks at access to equipment. Finally, the **University/Research** section highlights the Artificial Language Laboratory at Michigan State University in East Lansing, Michigan.

It is a busy and exciting time of year for many people, including ACN staff. Thanks to every individual who contributed information and insights to this issue. They are listed as resources on page 8. The dolphins are plentiful and playful in Monterey Bay this Spring. If you visit the area, let us know.

Sarah Blackstone, Author.

For Consumers (cont. from page 1)

hire someone to give your child piano lessons who was not an accomplished pianist? *Probably not.* Would you expect a recital after a few sessions? *Certainly not.* Yet, most people who instruct people to use AAC equipment are not expert AAC users *(and many have never used a device to communicate)*. Also, most AAC users are given little time and/or instruction to achieve operational competence.

I asked two men, who have severe physical challenges and have used a variety of AAC devices, to share their ideas about training people to use AAC devices. Both are named Michael, live on the West Coast, are in their "middle" years, and have the wisdom and insight to prove it! They illustrate how much we have to learn from real AAC maestros.

Mike Ward[5], diagnosed with bulbar amyotrophic lateral sclerosis five years ago, has used communication devices for the past 4 years. He uses a single switch to run Words + Scanning WSKE and a variety of software applications. Mike, a physicist at INTEL Corp., is highly computer literate and technologically competent. He offers the following advice to trainers of AAC device users, based on his own

experience and on the years he has taught people to use electron microscopes. His bottom line? KISS . . . Keep It Simple . . . . !

- 1. Think like a person seeing the device for the first time. People with acquired disabilities hope the device will allow them to have a normal conversation again.
- 2. Trainers must be prepared. Have the system fully set up and checked out before you start. Trainers should have used the system enough to have a good feel for it and should know it is working well. There is nothing worse than fiddling with wires and disks while the user watches and tries to understand, eventually getting confused and intimidated. **They deserve better.**
- 3. Set up the system so it needs minimal user adjustments.
- 4. Set up the system so speech is immediately possible.
- 5. Set the timing on input devices so success is insured.
- 6. Make sure vocabulary is very motivating.
- 7. List vocabulary out for the user (limit the length). Group it according to function (e.g., greetings) and include codes.
- 8. Remember. . . people learn and remember by doing.
- 9. Keep in mind the goal of the first session is to immediately enable the individual to use the equipment with minimum frustration. Focus on what the person needs to do (e.g., turn the machine on and speak/write).
- 10. Get the user running in the first 15 minutes using canned phrases. Let them explore speech and writing. Don't get into options and adjustments.
- 11. Answer questions simply. Keep the person working/playing. Through using the device, they start to explore and learn.
- 12. At the end of the first session, turn everything off. Have user turn it on and say something.
- 13. People don't remember everything the first time. Have a step by step start up and shut down written procedure for the first session and use it.
- 14. After the first session, send the user home to practice, discover and learn. Encourage them to use the help files or manual. Mark sections they should look at in the documentation.

- 15. Consider using a videotape that goes through all the modes of operation. Ideally manufacturers would provide this useful reference for the user; but trainers can make a usable one by recording the "checkout" and first session.
- 16. In the next sessions, help solve problems, adjust the input parameters and show more features and techniques.
- 17. Find out how your user learns. Some people follow memorized routines, others need to understand concepts first.
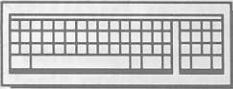
Michael Williams,[6] Vice President of Hear Our Voices,[7] an international AAC consumer organization, suggests expert communication aid users assist in the training of users in their local communities. Michael has cerebral palsy and has used communication augmentation for 40 + years. Currently, he uses Prentke Romich's Touch Talker with Words Strategy. He offers the following suggestions to persons learning to use a device:

- 1. **Know your device.** Be thoroughly acquainted with the encoding system. Know how to store words and phrases in memory. Know how to remove words and phrases from memory.
- 2. **Know your vocabulary.** Be generally familiar with pre-stored vocabulary and keep a record of the words and phrases you store in your device. Note: Michael keeps a Hypercard stack of stored vocabulary and prints it from time to time.
- 3. **Make a commitment to your device.** Put away that old device you've been using . . . at least for awhile. It's critical to learning your new system.
- 4. **Don't get discouraged when other people make negative comments about your "voice."** Go right on using your device. People will soon get used to it.
- 5. **Practice, Practice, Practice.** Practice is the key to becoming a good communication device user. You can have the finest communication in the world and yet not be a very good communicator because you don't spend enough time on your device. Practice conversation: Michael holds imaginary conversations with himself and plays both sides. He says "This may sound strange to anyone who might overhear me, but I get in many hours of practice and build up my speed and accuracy on the device that way." You don't have to have a conversational partner in order to get in hours of useful practice.

Review vocabulary. Review the lists of vocabulary stored in your device. Keep these lists where you can get to them easily." I review them two or three times a week. That way I am always up on the vocabulary that's in my device."

Both Ward and Williams agree part of being an expert user is:

- **Realizing the limitations of communication devices.** "I've always tried to push a device way past its limits," says Williams. "Once I got it through my thick skull that no communication device is suited to spontaneous oratory, I got along fine."
- **Realizing how best to use certain features of the device.** Ward points out that in real discussions "partners start to read the display. Thus, you don't really use the voice much." However, he feels it is important to have a good voice synthesizer (so you are understandable the first time) to greet people, request help, and make short comments that fit into a group discussion. "After a short while," he says, "your voice synthesizer will be your voice in most peoples minds. I think it is important you feel good about it."

Equipment
Manufacturers' role in training

Manufacturers of AAC devices and their representatives are an integral part of most AAC teams. They assume a major responsibility for increasing professional and consumer awareness (Phase I); and for instructing users, caregivers, and professionals to operate their equipment (Phase II). They also work (in conjunction with other team members) to interface their equipment with other peripherals. Listed below are 10 instructional methods manufacturers use to teach operational competence.

Manufacturers concur it is _not_ their responsibility to teach professionals or consumers how to apply communication devices, i.e., develop communicative, social, and strategic competence (Phase III). These competencies are the responsibility of professionals, consumers, and caregivers. While admitting that the variety of devices with different operational procedures can be a nightmare for professionals, AAC manufacturers are frustrated because many buyers, prescribers, and administrators still don't know what is on the market, never mind how to use equipment despite their efforts, as described below.

Instructional Materials

1. Promotional catalogues/flyers. At least once every year, AAC companies prepare, print and distribute hundreds of thousands of catalogues/flyers throughout the world. This printed information describes available products, their features, and pricing information.

How to take advantage: Get on everyone's mailing list (or you'll soon be out of date.) As new catalogues come in, throw old ones away. One drawer in a file cabinet works for me, with a separate file for each company.

2. Newsletters. Many companies now publish a quarterly newsletter. It contains announcements of company activities/workshops, descrip-

tions of new products, and feature stories. Information is time-bound.

How to take advantage: If you are on the mailing list, you'll automatically receive a copy. Read each issue as soon as possible. Cut out information on new products and upgrades and stick it in your file.

3. Exhibits. Manufacturers go to conferences to demonstrate

devices, peripherals, software, and materials and to interact with professionals and consumers. They spend hours on their feet, sharing their expertise. AAC manufacturers and their representatives take pride in what they sell.

Note: The worst time to go through an Exhibit Hall is at the beginning and end of the conference when it is very busy.

How to take advantage: Exhibits are probably the best opportunity we have to develop and maintain our awareness of available tools. However, Exhibit Halls are intimidating to most people, who feel uncomfortable, overwhelmed, and exposed. Manufacturers report it is not only the novice who seems to have problems taking advantage of exhibit time. While students are often reluctant to come into a booth and ask questions, manufacturers said

that AAC "experts" rarely come into a booth to <u>learn</u>.

Larry Weiss,[8] current president of the *Communication Aids Manufacturers Association,* likens the Exhibit Hall experience to being in a strange city/country with only limited time to explore. Table I. contains eight helpful hints from manufacturers to help you get around and benefit from exhibits.

Table I. 8 Ways to Take Advantage of AAC Exhibits

1. At the beginning of the conference, take a quick tour through the Exhibit Hall. Look at every booth. Note what you want to see in more detail and plan to return <u>later</u>.

2. Look through your catalogues in advance. Circle equipment you want to see. Make notes. Then, bring the catalogues with you.

3. Exhibitors want to find out what information you need and give it to you as efficiently as possible. Try to define your needs clearly: If you have limited time, tell the exhibitor.
- I'm just being introduced to the area of AAC. Can you acquaint me with this device, how it operates, and its primary features?
- I work with severely mentally handicapped adults in a workshop setting. One client needs a device that is portable, has intelligible speech output, etc. Do you have any products I might consider?
- My client is a direct selector, is literate and wants a device with speech and printed output that permits him to do word processing and use a modem. What do you have?
- I teach a graduate seminar in AAC. What materials can I use to teach my students about device features?

4. Examples of good questions are:
- Who did you design this product for?
- How could we use this product in _____ (e.g., a regular junior high school math <u>class</u>?)

- What are primary features of this product?
- What peripherals work with this product? (e.g., computers, environmental controls, modems, appliances, etc.)
- How are these products different?
- If I purchase your product, what can I expect from the company re: funding assistance, training in operation, follow up visits, future training if the individual transitions to another setting?
- What happens when the equipment breaks?
- Do you have someone available in my area who can assist our team? Do you have a list of resources in my area?
- What can I expect if I put my name on your mailing list?

5. If an exhibitor is busy and you want to talk, make an appointment to come back later.

6. After you are shown how to operate a device/piece of software, say "I'd like to try it myself." This allows you to look in more depth and the exhibitor to help someone else.

7. Don't ask exhibitors to: a) Assess your client, b) Tell you "What's new." because they don't know "what's old" for you, c) Tell you what's coming in the future. That's proprietary information, or d) Give you equipment.

8. Don't dismiss a product for a client because <u>YOU</u> think it is too complicated or expensive.

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4. Operational Manuals. It's no secret. Most people don't read manuals. Imagine the frustration of those who publish them! Manufacturers continue to update manuals in response to consumer needs. Most concurred good manuals:
- Are not very long.
- Are written from the user's perspective
- Use a multimodality approach, recognizing some readers are visual learners; others learn from text.
- Are redundant, because people use them as a reference.
- Are organized in ways that allow the user to get started immediately, and find information easily.
- Use charts to help organize information.
- Have multiple sections, (e.g., Section 1 - Basic operations. Section 2 - application support (sample overlays, programming information). Section 3 - accessory[9] information (updates, references).
- Have separate manuals for software.[10]

Other manual ideas are:

- Help screens: making information accessible to the user on the screen.[11]
- Interactive start ups (e.g., manual talks you through basic operations. For example, "pretend you are going to the store. Here's how to ask questions." [Push this and this]. Now find what you need, and pay for your items [Push this and this].[12]

How to take advantage: Before training someone to use a device, you have to become thoroughly familiar with the manual. Note: to save time *(and embarrassment),* always look in the manual for a solution before calling the company.

5. Manufacturers representatives. These critical members of AAC teams can provide access to equipment, demonstrate device features, recommend peripherals, train people to operate equipment, share strategies, help develop training plans that motivate and encourage the use of equipment, and assist with trouble shooting. Representatives often work in a functional, application-oriented manner with small groups of learners.

How to take advantage: These individuals are excellent resources and know the equipment they sell/distribute better than most professionals. Be aware and respectful of their role. They are sales people. They don't replace the professional's evaluation, write prescriptions, or provide intensive, ongoing training to clients.

6. Videotapes. Videotapes are an effective, multimedia approach to training. Manufacturers seem to be expanding their use of videotapes to: 1) introduce their products to professionals, consumers, agencies, and institutions, and 2) train professionals and consumers in the operational use of products. A major concern of manufacturers, however, is the perceived quality of their tapes. Companies are reluctant to disseminate anything but professional quality tapes. However, it costs lots of money to produce professional videos. Note: I'd gladly settle for well edited, home style versions!

Manufacturers! Please consider providing videotaped examples of expert users. We need to know what is possible. Many devices are underutilized. Instructional tapes that demonstrate what is possible and describe how the user became competent could be a powerful marketing and instructional tool.

How to take advantage: At this point, very few companies provide customers with videotaped training. However, when you buy a device, peripheral or software package, inquire about the availability of a videotape. Even if the company does not have one, they may know of an organization/agency that does; and you might be able to borrow, rent or buy it. Or, make your own, as Ward[5] suggests.

7. FAX machines and electronic mail. Occasionally these technologies are used to communicate with manufacturers. FAX allows professionals to send photos, sketches and diagrams. Electronic mail allows companies to pass questions along to the most qualified person to respond to inquiries. These are efficient, cost effective methods of communicating.

How to take advantage: For products manufactured outside your country, FAX messages and electronic mail offer the flexibility needed to maintain contact with people who are going to bed at the same moment you are getting up.

8. 800 numbers. Many U.S. manufacturers offer 800 numbers (see page 8). Representatives talk people through their problems and try to raise each caller's level of confidence. Often, they can refer people back to the operational manual. Manufacturers report most calls involve computer hardware and software problems.

How to take advantage: Call the 800 number when you have questions about purchasing devices, software, and peripherals, when you get stuck operating the equipment, and when there seems to be a problem with the equipment. Make a list of questions and have all the equipment with you, before you place the call. Problems often can be solved over the phone.

9. Rental/evaluation/loaner programs. The bottom line is you can not learn to operate a device unless you can use it regularly.

Clinical News

"You know, I hadn't planned on learning anything else"

Not all adults really expect to learn new information after they finish school. They do, of course, because *learning* is life-long. However, "formalized" or "required" learning experiences may not be viewed in a positive manner. This is particularly true when the topic involves the "T" word. . .Technology.

The nation (i.e., the U.S.) that flocked to oat bran in response to a study conducted with only 250 patients still can't accept the benefits of educational technology, even though the benefits are being shown every day with hundreds of thousands of students. (Thornburg, 1991)[13]

Learning is risky. Learning is an exposure to new ways of thinking, which may conflict with your "mind set" and habitual way of doing things. Such conflicts often cause anxiety, which may interfere with learning. Clearly, we need to understand more about how people learn; and more specifically, how people learn to use AAC technology.

According to the educational philosopher and Hewlett Packard Vice President Chuck House (as quoted by Thornburg)[14], learning takes place in four stages:

- Stage 1 *We don't know that we don't know* (or ignorance is bliss). In the area of AAC, stage 1 is where most people are. Despite our efforts, many clinicians, educators, families, and employers have never heard of augmentative communication. For example, people often ask me "what is **argumentative** communication?" Oh well!

- Stage 2 *We know that we don't know.* Stage 2 begins for some, when a doctor says "your family member is unable to talk." For others, an administrator or parent says, "I have a student who does not walk, talk, or use a pencil. She will be in your 3rd grade class or on your caseload next year." That's the beginning of knowing you don't know. Often, panic sets in.

- Stage 3 *We know that we know.* In stage 3, professionals, families

and consumers are developing skills and an understanding of AAC as it relates to their own circumstances. They read, take courses, go to conferences, talk to colleagues and manufacturers, and practice using devices and techniques. This is the stage when you stop reading novels, start waking up in the middle of the night thinking about AAC, and begin talking in ways that are no longer understandable to your friends and family (e.g., *"she's using Blissymbols with synthesized speech and a light sensor to operate the device."*) Note: I believe our professional codes of ethics require at least a stage 3 of learning before providing AAC services.

- Stage 4 *We don't know that we know.* Stage 4 happens gradually and over time to those who specialize in AAC. People in this stage forget that not everyone knows what a *communication board* or *ETRAN* is. Stage 4, however, does not mean you stop learning. Quite the contrary, it increases your responsibility to the field. Unless you remain an active learner, repeatedly cycling through these stages, you'll quickly fall behind.

Technical learning styles

The technical learning styles of normal adults are poorly understood. For that matter, so are the technical learning styles of children and of people with various types of disabilities. In response to a question about who is *"easiest to teach about AAC devices,"* those interviewed said, "those with a positive *can do* attitude and those with prior technology experience." Negative factors noted were also attitude and prior experience related (e.g., the "no way it can work" or "not in my classroom" approach). Beukelman[15] has made the following observations to help us think about technology training:

- young adults tend to learn technology through exploration. They engage efficiently in collaborative learning with peers, are willing to make mistakes, and learn by playing with equipment and viewing videotapes. They do not mind learning from a manual.
- Middle aged learners, who are not familiar with technology, like to take notes. They do not like to make mistakes in public or wish to appear uninformed in front of employers, students, or clients. They are very application-oriented. They enjoy learning technology with a peer who has a similar learning style.
- Older adults without technical backgrounds seem to require one-on-one training and need lots of practice. They prefer not to learn from a manual

Novak & Tegtmeier[16] investigated the learning patterns of 16 young adults using three different instructional methods. The task was to perform 28 operations on a Touch Talker. Subjects were divided into 3 groups and received 3 different instructional methods: a) demonstration and lecture; b) a manual; c) a video. Each subject had access to a device during an hour long training session, independent of the method used. Results suggested that in the first hour subjects learned to perform 70 to 80% of the operations. *(No significant difference was observed between the conditions.)* However, 1 week later, subjects had forgotten between 1/3 and 1/2 of what they had learned. Their study points out that not only *how*, but *how long*, and *when* to train affects intervention sucess.

How to teach adults about technology

Harvey Pressman[17] currently directs CompuCid, a national project that trains trainers to implement computers in the schools. I find his approach to adult learners refreshing and asked him to describe how he approaches training. "First," he says, "you need to believe that:

- Adults have lots of things to learn from each other.
- A trainer's role is to provide a path to discovery, and.
- Trainers need to figure out ways to get information across that empowers people.

"Then, the most important part is to create a structure that supports learning."

- 1. Set clear boundaries and pay attention to "boundary conditions." Time is a boundary you need to control. Start and stop on time. Space is another boundary that has an impact on learning. Don't let the janitor decide how chairs are arranged, and where you stand or sit. Use space to encourage learning. For example, move around the room.
- 2. Model desirable behaviors during the training sessions. Tune in to individuals. Provide them with various *"points of entry"* into the learning experience. For example: a) give people jobs or assign roles (e.g., pass out materials), and b) get people to generate ideas.
- 3. Create a "hierarchy of voices." Give people a chance to think and discuss what you are going to talk about before they hear your voice.

Many companies rent devices and will apply the cost to the purchase price. Some manufacturers also provide loaners when equipment under warranty needs to be repaired.

How to take advantage: Each company has its own policy. Check before you buy. Make sure you fill out warranty forms and mail them back to the manufacturer.

10. Communication Aids Manufacturers Association. CAMA is a professional association. Members are committed to increasing the knowledge and skill of professionals, consumers, organizations and agencies. CAMA recently announced a series of regional conferences in the United States, co-sponsored with USSAAC and ISAAC. The purpose of each 2-day conference is to provide participants with blocks of time for product demonstrations, hands on experiences, and lectures conducted by manufacturers in small groups. In addition, each conference features a series of presentations by an AAC professional. The first conference is being held this month in Hartford Connecticut area, and I am the speaker. Look for announcements of CAMA conferences in your area.

How to take advantage: Contact CAMA on issues related to AAC manufacturers, equipment, distribution. Write or call: CAMA, 1101 Connecticut Avenue, N. W., Suite 700, Washington, D.C. 20036 *(202) 857-1138.*

(continued from page 5)

• 4. Approach training as though it has a beginning, middle, and end. For example, *Plan "Opening Noises."* Do something that signals to participants that "this is different. You are not going to be able to transcribe things from my notes to your notes without it ever passing through either of our brains." *Plan "Closing Noises."* Always get closure or the appearance of closure. For example, open and close with statements and ask for comments about whether participants agree or disagree.

• 5. Break in on linear thinking. Help people think in alternative ways. For example, ask them to think and reflect about the learn-ing processes they've just been through. Ask "Why did I do it this way?" Use role playing and a "walk in my shoes" approach.

• 6. Use all kinds of intelligences when teaching:[18] Linguistic; logical/mathematical; intrapersonal; spatial; musical; bodily-kinesthetic; interpersonal.

Summary

Accepting and learning to use high technology presents a challenge. Technophobias, time constraints, and limited access to equipment are barriers. However, whether or not someone becomes competent depends upon the motivation of those involved, complexity of the equipment, opportunities to practice, support of manufacturers, and skills of each user and his/her teachers. We are all students of technology.

During the 1990s, many more people of all ages and backgrounds will be learning about AAC. Those interviewed agreed we need:

• ways to change attitudes about technology and its role in our lives, as well as the lives of those with disabilities.

• research in the technical learning styles of all groups expected to operate AAC devices.

• alternative methods of instruction that improve the quality and effectiveness of learning and reduce its costs.

• a concerted effort to learn from those who are expert users what it means to be operationally competent and how to get there.

Governmental
Assistive technology & loan programs

One thing is for sure. Limited access to technology is a barrier to successful intervention. Having equipment available is necessary prior to purchasing a device, so individuals can try it and demonstrate that the equipment is: a) appropriate, and b) useful. Then, once a device is procured, individuals obviously need to have it with them so they can practice using it. Unfortunately, assistive technology is often not readily available to people who need it. Funding is nearly always cited as a major constraint. Over the years a range of strategies/programs have been investigated to increase access to technology. In an **ACN** survey published in the July 1990 issue *(Vol. 3, #4)*, respondents indicated they considered loan programs among AAC's "best practices."[19] This article focuses on loan programs, and issues related to two concepts of "a loan" (i.e., the act of lending).

Loan *(as in Money).* Recently, the U.S. Government funded 3 organizations experienced in providing financial assistance to individuals with disabilities, families, or employers for the purchase of assistive technology. Grants were funded under P.L. 100-407 for income-contingent loan demonstration projects. Each project is different; however, all will collect data and provide technical assistance to other organizations/states who might wish to benefit from their experience in loaning money for devices. Those funded were:

• Alpha One Center for Independent Living, 85 E. Street, Suite One, South Portland, ME 04106. (Kim Wallace) (207)-767-2189

• American Foundation for the Blind, 15 West 16th Street, New York, NY 10011. (Sheron Rice) (212) 620-2117

• National Easter Seal Society, 70 E. Lake Street, Chicago, IL 60601 (Sully Alvarado) (312) 667-8400.

For example, the Maine program got voter approval for a referendum to create a $5 million loan fund administered by a state finance agency for long-term guaranteed loans and "mini loans," primarily from the interest on these monies.

Loan (as in Equipment). Some governments, companies, organizations, agencies buy equipment for individuals, allow them to borrow it for short and/or long term (with certain guidelines in place), and retrieve the equipment when the individual no longer wants, needs it or qualifies for it. For example, in California, a low incidence funding program is available to purchase equipment for students who qualify (e.g., orthopedically impaired, dual sensory impaired). When the student leaves school (or a certain district), the equipment remains and may be reassigned to another student. This obviously creates a different set of problems.

Karen Franklin[20], Director of the RESNA **Technical Assistance Project** (see below), feels equipment loan programs have great potential. She points out the difficulties, however, in administering them, in reallocating equipment, and in dealing with "due process" issues and procedures. For example, when there is limited money and equipment *(and there always is and will be)*, how do you decide who gets the loan? And, what do you do when someone disagrees? In Iowa, they have instituted an equipment loan/swap program. Funding does not go to buy equipment or lend money, however, but to support a newsletter where available equipment is advertised. Individuals interested, contact the person advertising the equipment directly. For information about that project, contact Elaine Sexsmith (319) 356-0768.

* RESNA's Technical Assistance Project, 1101 Connecticut Avenue, N.W. Suite 700, Washington, D.C. 20036. (202) 857-1140.

University & Research

Artificial Language Laboratory: Michigan State University

The Artificial Language Laboratory (ALL) is a research and teaching laboratory at Michigan State University (MSU), East Lansing, Michigan. Founded in 1972 in MSU's Department of Computer Science, it currently is located within the Department of Audiology and Speech Sciences, College of Communication Arts and Sciences. Dr. John Eulenberg, Director and a major contributor to the field of AAC, says the purpose of the Lab is to *"apply linguistics and computer technology to the needs of persons who experience severe communication handicaps."* Stephen Blosser is Technical Director.

Language-based projects

Chinese. In collaboration with the Sichuan University in the Peoples Republic of China, two high-quality voice synthesizers, based on linear predictive coding were developed in the 1980s. The second, an unlimited-vocabulary system, takes pin-ying (Chinese phonetic transcription) as input and produces correctly intoned voice output. Related projects developing AAC applications are underway at the Sichuan University.

> Eulenberg, J. & Gou, D. (1985). Design factors in a Chinese language voice output communication aid. The Official Proceedings of Speech Tech '85. Media Dimensions, New York: 212-213.
> Eulenberg, J., Gou, D. & Rakerd, B. (1986). Towards an unlimited Chinese language VOCA. Proceedings of Speech Tech '86, Media Dimensions, New York: 106-7.

Hebrew. Previous work at the Lab resulted in the development of a portable computer that allowed a boy to perform the requirements of his bar mitzvah, the Jewish coming-of-age ceremony. The system permitted traditional Hebrew letters and cantillation marks as input and a synthetic 13-year-old boy voice, complete with the traditional Hebraic melodies, as output. Currently, the staff collaborates with Israeli clinicians and technologists to create Hebrew-based systems.

> Eulenberg, J. Coming of age in the age of computers. Communication Outlook. 7:2, 14-15.
> Eulenberg, J. Yan Sheinfeld's new song. Communication Outlook. 9:2, 9-13.

Indian. In collaboration with staff at the Eastern India Spastics Society, in Calcutta and with financial support from Indians living in the U.S., this project aims to create appropriate AAC technology for persons who speak Hindi, Bengalik and Kannada

> Eulenberg, John. (1989). The India voice research project. Proceedings of the First ISAAC India Conference, Calcutta, India.

West African. Staff have begun to analyze a number of West African languages in collaboration with speech scientists in Africa. The goal of the project is to develop text-to-speech systems.

> Amedofu, G. & Eulenberg, J. (1988). Extending Augmentative communication devices to new language communities: The case of Ewe in Ghana, Togo, and Benin (West Africa). Communication Outlook. 9:4, 15-17.

Interface development projects

Detented optical joystick. The detented joystick is a control system for foot/hand operation providing a mechanical filter against tremor or spasticity. It allows a computer user to select symbols on a screen configured by software in a variety of possible ways for communication or keyboard emulation. $1,200.

> Blosser, S. & Eulenberg, J. (Sept./Oct.,1985) A customized joystick for computer control. Proceedings of the 38th Annual Conference on Engineering in Medicine and Biology. Chicago, IL, 310.

SCATIR switch. The Self-Calibrating Auditory Tone Infrared switch requires no pressure to activate. It combines a sensor (source of pulsed infrared light) and a photodetector (tuned to a particular frequency or pulsed infrared light). When the switch is activated, an optional tone can be heard. Activation distance ranges from a few inches to direct contact. The device also has a self-calibrating mode, which makes it suitable as an eye-blink detector. $120.

SINO interface system. The Smart Input-Output interface translates the output of a standard wheelchair joystick (pulse-width modulated analog signal) into a form that can be used by a computer-based communication aid (parallel or serial digital signals). This is useful for persons who want to control their devices using the same joystick. $50 for board; $250 for package.

MiniVOCA. The Multiple Input and Infrared and Voice Output Communication Aid is an individually customized wheelchair-portable communication aid configuration. It consists of a modified standard laptop computer (MS-DOS) and a MiniVOCA control unit. Input options include a touch screen and a variety of switch configured inputs. The VOCA integrates a DECtalk II board with the SC-02 (SSI-263) synthesizer for foreign language and sound effect capability. Mayer-Johnson Company's Picture Communication Symbols[21] as well as personalized graphics are available.

Autonomous voice for persons with ALS. James Hamilton is working with Eulenberg on an approach to creating a person's own synthetic voice, with intonation characteristics preserved, using 5600 series digital signal processing chips.

Attitudes towards VOCA Use. Mary Ann Berthiaume is developing a guide for age, gender, voice quality as part of a descriptive study entitled *Mapping Perception of Listeners to the Parameter Space of SC-02 Voice Synthesizer*.

And more . . .

In addition to research, the Lab staff provides professional education at the preservice and inservice level, information dissemination activities, and supports clinical programs. For example, staff are:

- 1. teaching university courses to undergraduate and graduate students in Audiology and Speech Sciences, Linguistics, Computer Science, and Telecommunications.
- 2. serving on student research committees at the M.S. and Ph.D. levels.
- 3. publishing Communication Outlook, a quarterly magazine affiliated with ISAAC, and the oldest publication in the area of AAC; and providing audiovisual materials.
- 4. conducting research-based projects of individual customizations & intervention.

Student opportunities (and stipends) are available. For additional information, contact. Dr. John Eulenberg, Artificial Language Laboratory, 405 Computer Center, Michigan State University, East Lansing, MI 48824-1042. Phone (517) 353-6622.

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[4] David Beukelman (April, 1991). Personal communication.

[5] Mike Ward (April, May 1991). Personal communication.

[6] Michael Williams (April, May, 1991). Personal communication.

[7] Hear Our Voices, Corporate Office, 105 Pine Street, Wooster, OH 44691.

[8] Larry Weiss (April, 1991). Personal communication.

[9] Bill Forde (April, 1991. Personal communication.

[10] Joan Bruno (April, 1991). Personal communication.

AAC Companies with 800 #'s

Adaptive Communication Systems:
800 247-3433 (EST)

Don Johnston Developmental Equipment:
800 999-4660 (CST)

Dunamis: 800 828-2443 (EST)

Phonic Ear, Inc.: 800 227-0735 (PST)

Prentke Romich Co.: 800 262-1984 (EST)

Words +, Inc.: 800 869-8521 (PST)

Zygo Industries.: 800 234-6006 (PST)

NEW MATERIALS

ASSISTIVE TECHNOLOGY: A FUNDING WORKBOOK. 330 page workbook prepared by the Technical Assistance Project. Part I (**A road map to funding sources**), written by Michael Morris, provides information about what is possible with state and federal funding streams in U.S. Part II (**An outline of federal laws and rules**), written by Lewis Golinker, describes three principal sources of support for assistive technology funding: Medicaid, Programs under the Individuals with Disabilities Education Act, and the Rehabilitation Act and its amendments. Available for $25.00 U.S. ($29.00 Canadian). Make check payable to RESNA Press. Mail to: Department 4813, Washington, DC 20061-4813.

WALLCHART OF COMMERCIALLY AVAILABLE COMMUNICATION AIDS. The updated version of Kraat & Kogut's chart is now available. This excellent reference lists the features of over 50 augmentative communication systems. Single copy = $5; 10 copies = $40; 25 copies = $90. Make check payable: University of Delaware. Mail to Applied Science & Engineering Laboratories, A.I. duPont Institute/University of Delaware, P.O. Box 269, 1600 Rockland Road, Wilmington, DE 19899.

[11] Walt Woltosz (April, 1991). Personal communication.

[12] David Gordon (April, 1991). Personal communication.

[13] Thornburg, D. (1991). Education, technology, & paradigms of change for the 21st century. Palo Alto: Starsong Publication.s, p. 13.

[14] Ibid., p. 25-26.

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[19] Blackstone, S. (1990). Augmentative Communication News. 3:4, p. 4,7.

[20] Karen Franklin (May, 1991) Personal communication.

[21] Mayer-Johnson, P.O. Box 1579., Solano Beach, CA 92075-1579.

RESOURCES

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