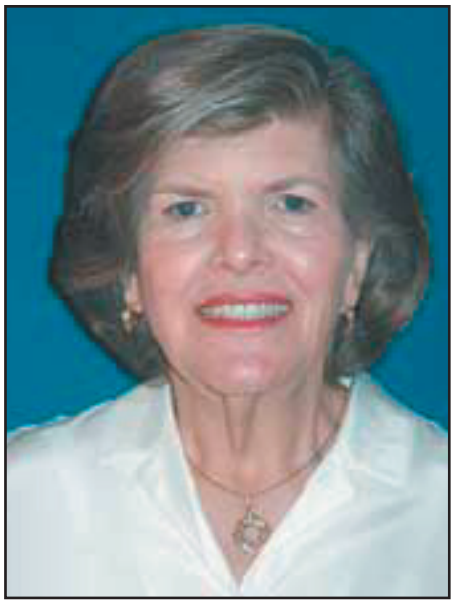
Closing The Gap

Assistive Technology for Children and Adults with Special Needs

AT – IN DEPTH

Lite tech should always be an option in AAC selection



By Elizabeth (Libby) Rush and Mary Joan McClure

As interventionists working with Augmentative and Alternative Communication (AAC), the ideal outcome of our services is to assure that users have a means of expressing needs and wants, developing social closeness with others, exchanging information and fulfilling social etiquette routines. These four main purposes of communicative interactions, defined by Light (1997), must be the primary focus of AAC interventions. To achieve the ultimate goals of communication, the appropriate technology has to be carefully identified, selected and implemented.

The high tech craze across the nation has unfortunately influenced decision making in AAC services. People have equated high tech to being the best tech for all. Historically, much consideration has been given to identifying high tech options. Families of teenagers and young adults have often resisted lite tech, feeling that high tech is the best intervention choice for their child, who deserves the

In this issue, our featured columnists are Elizabeth (Libby) Rush, MA, CCC-SLP, CPM, AAC/AT Consultant, Durham, NC and Mary Joan McClure, MS, CCC-SLP, Director of Speech, Language & Hearing Services, Murdoch Center, Butner, NC. Join us, as the authors introduce readers to a large range of lite tech AAC devices from major manufacturers. Armed with this summary of current offerings, interventionists have some basic tools for making decisions about this technology. Readers should remember: lite tech is always an option, and careful consideration of available devices will result in the best possible outcomes for all AAC users."

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very best (Beukelman & Mirenda, 2005). The promises of high tech have seemed to provide all-encompassing solutions for complex communication needs. Though technologically advanced communication devices have been beneficial to many persons, they are not the panacea for all individuals needing AAC. Furthermore, lite tech has been viewed as so simple that little consideration has been given to the complexity of identifying and implementing its use.

So what is high tech or low tech or lite tech? Cook and Hussey (2002) define low tech as "Inexpensive devices that are simple to make and easy to obtain." Low tech devices have also been described as being easy-to-implement mechanical, structural or electrical solutions to problem areas. Cook and Hussey define high tech as "Devices that are expensive, more difficult to make and difficult to obtain." High tech has also been referred to as applications of complex electrical and electronic devices. For the purpose of this article, the terms high tech and lite tech will be employed.

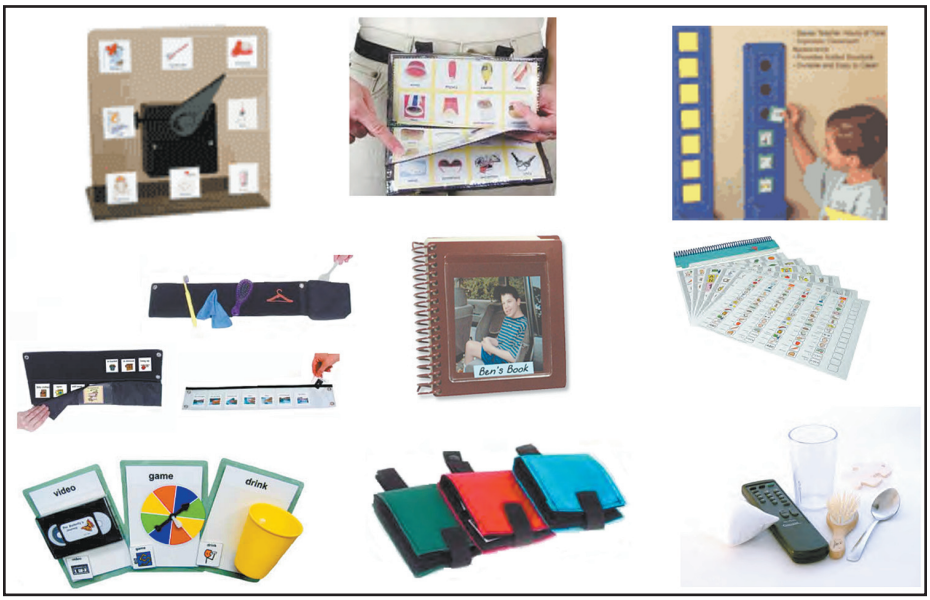

Figure 1. An array of non-voice output devices.

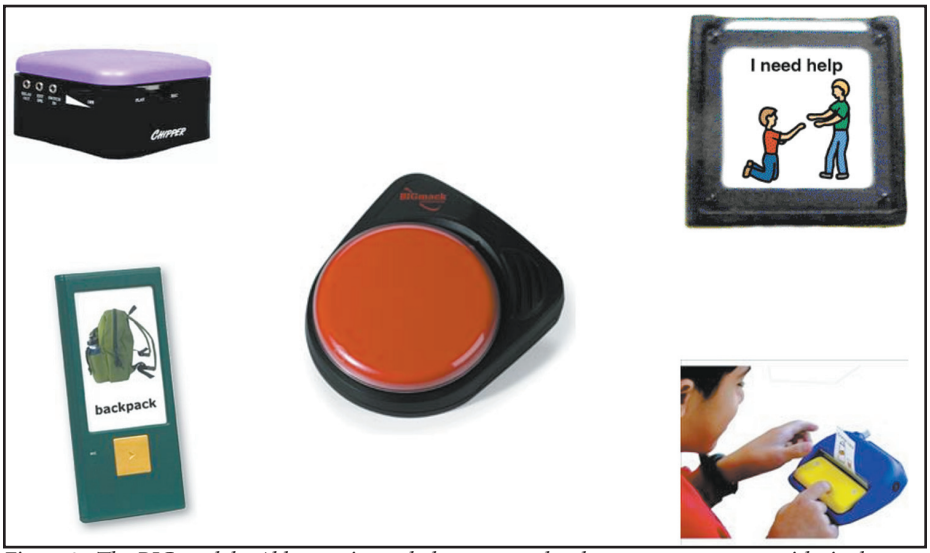

Figure 2. The BIGmack by Ablenet, pictured above center, has become synonymous with single message devices. From top left are the Chipper by Adaptivation, The Partner/One by AMDi, the GoTalk One by Attainment and the Single Message Communicator by Enabling Devices.

The authors prefer the term lite technology over low tech since low tech often implies a simplistic solution to an issue. The use of communication is a complex function and even the most simple, low tech device may be difficult to use and implement, which is one of the reasons the term lite tech is preferred. For the purposes of this article, lite tech AAC will also be defined as AAC devices with or without voice output and costing less than $1500.

Lower cost and greater ease in programming and use are clear advantages to selection of lite tech AAC for many individuals and the professionals and families working with them. Both factors make incorporation into learning, leisure, and vocational settings a real possibility. Through careful integration of lite tech AAC, these environments can be structured to allow for improved comprehension of and compliance with routine, better inclusion in activities, and greater control over the environment. Many lite tech AAC systems have considerably reduced motor and cognitive demands. Therefore, a number of individuals may have opportunities for immediate participation in activities. Even as functional use of a device is being developed, the user is reaping the benefits of socialization with peers in a variety of settings.

Lite tech systems are frequently integral to establishing communicative interactions with beginning communicators. In particular, non-voice output devices often support the use of functional communication in a variety of settings and can be instrumental in establishing communicative intent. Devices with few messages are often used to support participation in daily learning experiences, while complex devices permit extensive message formulation for involvement in more complicated activities. Communication has been recognized as being multimodal and AAC is no exception. Lite tech options can often contribute vital or unique opportunities for expressing different messages in different situations. Additionally, lite tech AAC devices are being employed throughout numerous settings for learning language as well as teaching a variety of concepts and skills.

Lite tech AAC has a role even in the communication repertoire of a high tech user. Many clinicians and teachers operate as though use of lite tech is precluded when

a high tech device is available. However, multimodal communication is natural, as even verbal communicators employ gestures, facial expressions, and other nonverbal supplementation to convey meaning. Since it is economical in terms of money and time, lite tech can be used to supplement more complex systems of communication. Even the most advanced systems occasionally fail, and back up symbol, word, or alphabet boards can mean the world to somebody whose primary method of interaction is unavailable. Boards made waterproof with laminate can be used in situations where moisture guards are not adequate protection: in bathrooms, by swimming pools, at the lake. Lite tech systems are often useful when AAC users are in positions from which they cannot access their primary systems, such as in bed, in recliners, or in the car. Additionally, many high tech users employ their complex devices with unfamiliar communication partners while using lite tech with familiar people (Cotts, 2007, Mathy et al., 2000). Interaction with family and close friends is often simpler and more routine, requiring a less complex communication system. It is also likely that AAC users enjoy engaging with loved ones in the social closeness that shared message building over a lite tech board can bring. That interdependence may also result in less fatigue than independent high tech message generation (Cotts, 2007).

Augmented communicative interactions involve, at a minimum, an AAC user and a communication partner. Partners vary in the amount of competence they possess. A recent discussion on the listserve of the American Speech-Language-Hearing Association's Special Interest Division 12 (Augmentative and Alternative Communication) identified poor communication partners as one of two major reasons that AAC systems fail and are abandoned (the other was poorly chosen vocabulary). The ease of use that has been mentioned repeatedly limits the amount of partner training required, and increases the probability of successful, enjoyable interactions.

Abandonment and decision making in AAC

Abandonment of both high and lite technologies continues to be an issue with an estimated one third of all devices being discarded. Depending on the type of tech-

Figure 3. Sequencers from top left include the Sequencer from Adaptivation, the Chickadee from Unlimiter, the Step by Step by Ablenet, Hip Step Talking Sequencer, Partner One/Stepper by AMDi and StepPad by Attainment

Figure 4. These devices allow for random playback of recorded messages: Adaptivation's Randomizer (L) and Enabling Devices' Big Talk Triple Play.

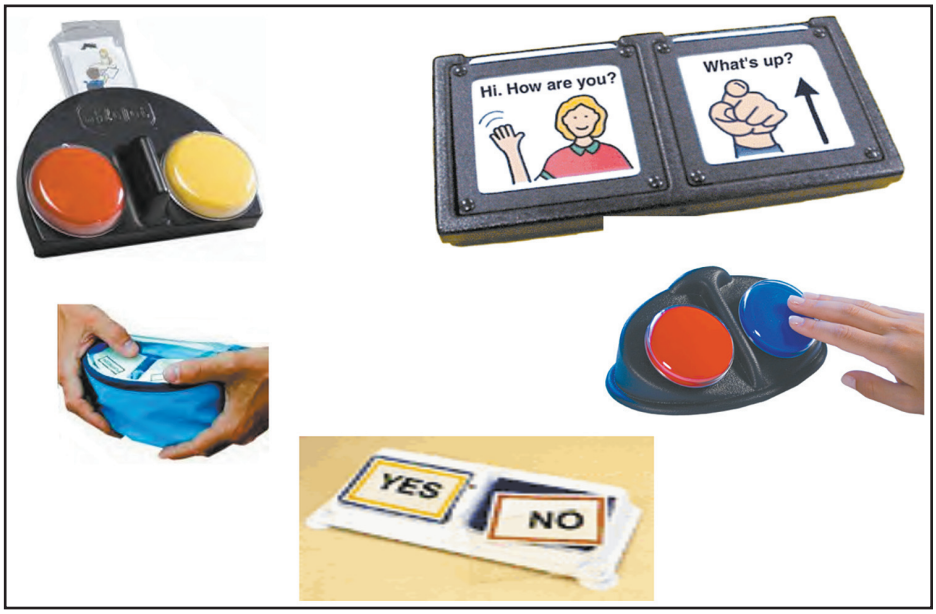

Figure 5. Two-message devices introduce choice making into AAC. Clockwise from left: AbleNet's iTalk2, AMDi's Partner/Two, Enabling Devices' Talkable II, Twin Talk, and Hip Talk

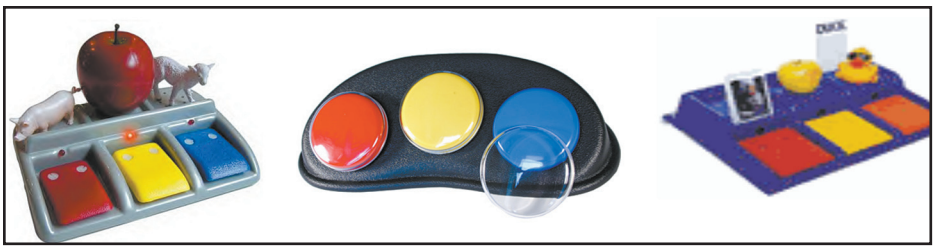

Figure 6. Enabling Devices is the sole manufacturer of three-message devices at this time: Compact 3-Message Communicator (L), Talkable III (M), Grooved Platform Communication (R).

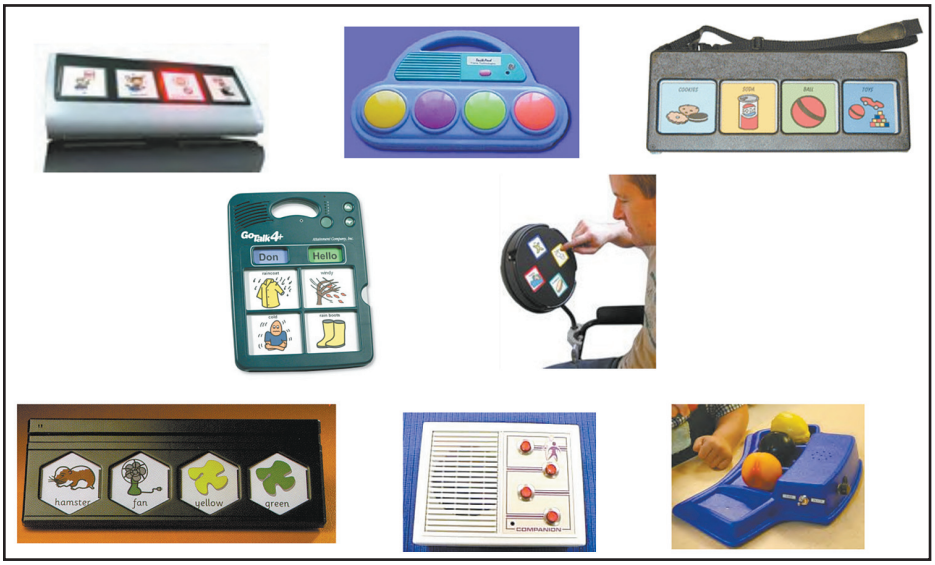

Figure 7. At least 7 companies provide a wide variety of options in four-message devices. Top Row: AbleNet's FL4SH, Frame Technology's Talkpad, AMDi's Partner/Four. Middle Row: Attainment's GoTalk 4+, Enabling Devices' Round Cheap Talk 4. Bottom Row: Inclusive TLC's 4Talk4, Luminaud's Companion 401 Communicator, Enabling Devices' Take N' Talk.

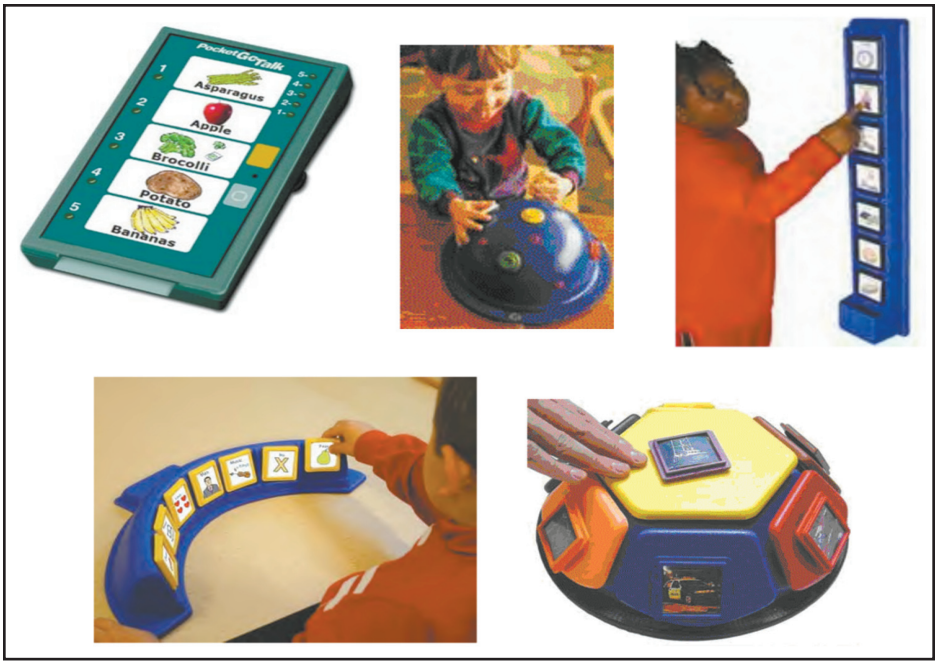

Figure 8. A limited number of options with 5 to 7 messages. Upper left: Attainment's Pocket GoTalk. Remaining devices are from Enabling Devices: Talking Bubble, Take N' Talk Go! Board, Take N' Talk Tabletop, Carousel Communicator.

nology, it is thought that abandonment can vary from as little as eight percent to as high as 75 percent. Most technology is abandoned within the first three months after acquisition (Phillips & Zhao, 1993; Scherer & Galvin, 1994). Each technology abandonment results in lost revenues, lost time in supporting and developing or rehabilitating language and loss of opportunity in establishing effective communication system with the resultant frustration for AAC users and their partners.

Lite tech has been viewed as so simple that little consideration has been given to the complexity of identifying and implementing its use. Selection and use of inexpensive communication systems deserve the same considerations as does choosing and utilizing high tech, costly devices. With the advancement of technology and the decreasing costs of that technology, many devices or device features once considered as high tech now fall within the realm of lite technology.

The sheer volume of lite technology communication devices available on the market today presents quite a quandary to the practitioners making decisions about augmentative communication for a large variety of potential users. A recent review of commercially available products by the authors revealed the existence of over 275 systems. Options include non-voice output vs. voice output, and message activation from single message to dynamic display. Clearly, such a large array of lite tech possibilities increases the need for careful consideration and selection to avoid abandonment.

Selection of lite tech AAC devices

Lite technology has most frequently been associated with individuals with lower cognitive skills. However, it is our hope that this article will provide a convincing argument that lite tech is always an option for all AAC users, either as the primary means of communication, or as a supplemental or situational method. Regardless, decisions must be made carefully and systematically, to make sure a good fit is provided. A comprehensive evaluation of the AAC user's skills and needs must be conducted; further discussion of evaluation is outside the scope of this article. Additionally, the practitioner must have access to extensive knowledge regarding options available in

order to match features of devices with abilities and requirements of the client.

Much has been written about feature matching in assistive technology. In regards to selection of AAC, some general features to consider include: device design, power source, input, display, usability, and output. General procedures involve identification of the client's relevant needs and abilities, the features most appropriate to deal with those characteristics, and the devices most likely to provide what is needed. With the large number of devices available, it is often difficult for the clinician to identify the needed information to make informed decisions in device selection. Device comparison is further complicated by the lack of consistent terminology, with many manufacturers using the title of a feature as a marketing gimmick rather than identification of device specifications. There are a few on-line resources to assist with this process, including the Web sites of the University of Washington <http://depts.washington.edu/augcomm>, AAC TechConnect <www.aactechconnect.com>, and Special Education Technology – British Columbia <www.setbc.org/Download/LearningCentre/Communication/aac_2005.pdf>.

Additionally, manufacturer and vendor Web sites provide detailed descriptions of devices, and representatives are available to answer questions about specific features. When such resources are used, the expertise of the practitioner must be employed to prevent a sales pitch from resulting in a poorly selected piece of technology. However it must be remembered that vendors and manufacturers are invaluable resources for current information and knowledge about AAC systems in the ever-changing world of technology.

In an attempt to collect objective information about lite tech AAC devices, the authors endeavored to identify device features as well as potential user characteristics, for many of the commercial products currently available costing less than $1500. Information was then entered into a chart that included name of device, manufacturer, cost, device features and characteristics of potential users along with a photograph of each item. This article will attempt to share an overview of the types of devices, features and user characteristics identified in the project.

Following are lists of devices available from major manufacturers, organized by number of messages or special functions. Obviously, AAC manufacturers produce an ever-changing array of devices; what is written about today may be gone tomorrow. Indeed, several devices were made available between a recent updating of our list in March and preparation of the following a month later. This report should be used as a general guideline regarding what is available, and an overview of manufacturers committed to meeting the needs of lite tech AAC users. Additionally, client characteristics that may match well with each particular category are listed, and may be used regardless of what specific products are on the market at any time.

Non-voice output

This extensive category of communication aids includes a wide array of non-talking communication displays, devices and materials that may accommodate text, symbols, objects or textured symbols to support communication. (Figure 1, page 7)

Boards: Attainment and Mayer Johnson

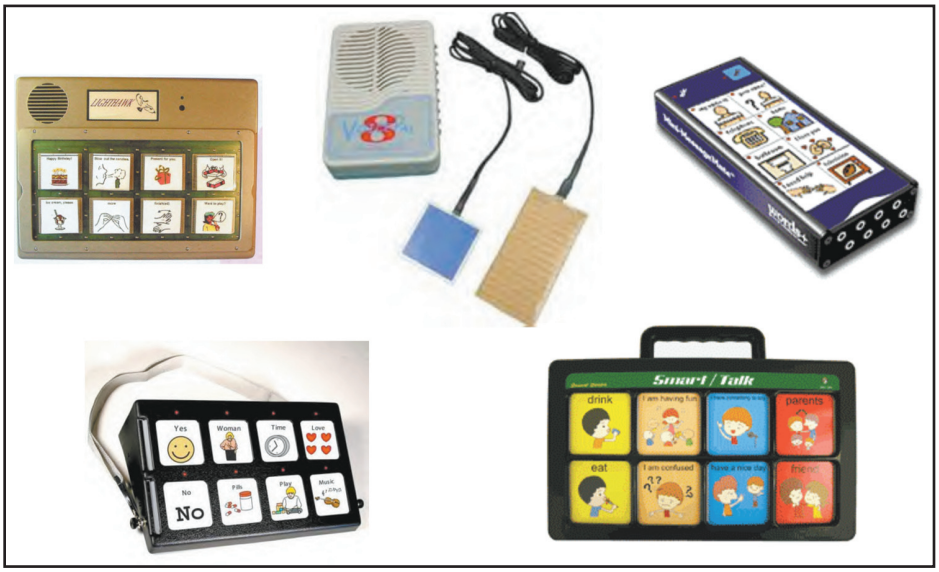

Figure 9. Eight-message devices offer a variety of interesting features. Clockwise from upper left: Adamlab's Lighthawk, Adaptivation's VoicePal 8, Words+'s Mini MessageMate, Enabling Devices' Talk 8, AMDi's Smart/Talk.

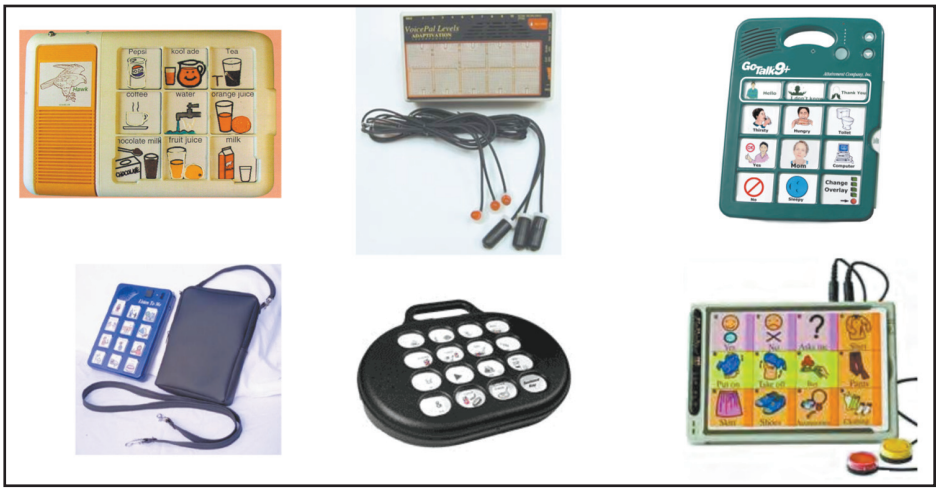

Figure 10. Devices in 9- to 15-message category range from one-level direct selection to auditory scanning of multiple levels; one system allows sequencing of messages to be played back as a complete sentence. Top row: Adamlab's Hawk, Adaptivation's VoicePal Levels, Attainment's GoTalk 9+. Bottom row: DTK's Listen to Me, Enabling Devices' Phrase Maker, Unlimiter's Hummingbird.

Books: Attainment, Augmentative Resources and Mayer Johnson

Clock Communicators: Enabling Devices and Tash

Display Boards and Units: Augmentative Resources, Enabling Devices (Grooved Platform Communicator and 8 Message Communicator Multiplex), and Mayer Johnson

Eye Gaze Boards: Enabling Devices, Object-Symbol Resource, Pro-ed

Objects: Rush and McClure Symbol Evaluation Kit, Talking My Way at Adaptivation, Object-Symbol Resource, LLC

Schedule Boards: Enabling Devices and Augmentative Resources

Textures: Transition Textures at Adaptivation

Wallets: Augmentative Resources and Mayer Johnson

Features to consider are ease in portability, size of display, number of messages and types of symbols that can be displayed, and capacity for customizing to meet needs of the individual.

Possible client characteristics:

• Limited symbolic functioning to complex literacy skills

• Need to understand communicative intent

• Need for concrete representation

• Visual issues comprising use of symbols or dynamic display

• Reject voice output

• Need for backup system

• Need to augment other AAC device

• Need exposure to wide variety of vocabulary

Ideas for using non-voice output (Rush & McClure, 2007):

• Specialty boards for specific situations, especially where other device may interfere with the event. (bowling display to use while at bowling alley)

• Serve as visual structure and sequence for completing tasks using individually made schedule boards or those from Augmentative Resources or Enabling Devices

• Provide vocabulary rarely needed by user (messages needed for hospital stay)

Single message devices

These simple devices permit the recording and storage of a single message. They can be useful for a number of communication opportunities, including gaining attention, participating in activities or using social greetings. Recording is usually simple and quick, which permits changing messages to use effectively across many activities. (Figure 2, page 7)

Ablenet: BIGmack, LITTLEmack Talking Symbols notepad

Adaptivation: Chipper, LEX, VoiSec

AMDi: Partner/One

Attainment: GoTalk Button, GoTalk One, No Touch Talker, GoTalk Card, Clip Talker, Personal Talker and VoicePod

Enabling Devices: Big Talk, MiniCom, Motion Talker, One message recorder with divider, One Take and Talk, Put-emarounds, Say It Play It series, Side Swiping Communicator, Single Message Communicator, Small Talk, StoryTeller, Talking Alert, Talking Picture Card Holder, and Wrist Talker

TASH: Talking Buddy

Devices can range in size from very large activation space to a small button on the device. Features to consider might include volume control, length of message, type of motor-kinesthetic feedback, quality of recording, contact surface, amount of pressure needed to activate. Enabling Devices has a variety of single message devices that are configured with modifications that might appeal to those needing enticement to utilize voice output.

Possible client characteristics:

• Motivated by voice output

• Emerging communicator

• Single message meets situational needs

• Need for portability

• Object or symbolic level

• Indicates preferences/makes choices

• Motor skills ranging from limited to fine

• Desire to participate in interactive situations

Ideas for using single message devices (Rush, 2005a):

• Call the cat or dog

• Comment on own new haircut, shirt, glasses, etc.

• Draw attention (Look what I did)

• For emergency message by telephone

• Have a speaking part in a skit

• Indicate "I'm Here." during attendance

• Issue invitation to a party, or to go out or for a visit

(Hint: Provide a number of symbols with possible messages printed on the reverse side. Communication partner can quickly record the message and add the symbol to the device. For example have a symbol for video tape with message selection on the reverse that might include: "We are going to watch a video at 7:00." or "Did you like that video we watched today?" or "What is your favorite video?" "I love videos about animals, what do you like?" etc.)

Sequencers

A sequencer is a voice output device that allows the recording and storing of a series of messages, one after the other in sequential order. Sequencers have one contact surface for accessing the messages in the sequential order in which they were recorded. These systems permit participation in scripted communication interactions, such as reading stories, taking class attendance or singing songs. Devices can also be used to aid individuals in independently performing sequential activities, such as performing work tasks, following recipes or completing schedules. (Figure 3, page 7)

Ablenet: Big Step by Step and Little Step by Step

Adaptivation: Sequencer

AMDi: Partner/One Stepper

Attainment: StepPAD

Enabling Devices: MiniCom Sequencer, Step Talk Sequencer Series, Hip Step Talker Sequencer, Talking Magic Roller, and MultiCom

Unlimiter: Chickadee and Chickadee 3

Features to consider include those involving access, for instance, contact surface size, amount of pressure to activate and angle of contact surface. Amount of recording time, volume control and possibility of levels should also be examined. Consideration should be given to ease or difficulty in recording.

Potential client characteristics:

• Motivated by voice output

• Emerging communicator

• Limited messages meet situational needs

• Need for portability

• Object or symbolic level

• Motor skills ranging from limited to fine

• Desire to participate in interactive situations

Ideas for using sequencers (Rush, 2005b):

• Announce basketball players as they go on the court
• Caller at square dance
• Conduct an interview
• Deliver a report
• Describe slides in a slide show
• Flirt

Randomizers

Randomizers are relatively new products that allow for a number of messages to be recorded and played in a random order. There is a single activation area for playback of all messages. (Figure 4, page 8) Two companies producing this product and their devices are:

Adaptivation: Randomizer

Enabling Devices: Big Talk Triple Play

The Randomizer offers two levels; the Big Talk Triple Play has four levels and can also function as a single-message device or sequencer. These devices may support engagement in simple communication routines or participation in many of the same activities as their peers. Both randomizing devices have the ability to control external switch-activated toys or appliances. Other features of access to consider when choosing a randomizer include size of activation area, angle of contact surface, amount of pressure required for activation, and recording time.

Possible client characteristics:
• Motivated by voice output
• Need for randomized messages to participate in classroom activities or leisure opportunities
• Non-scanning, single-message output device user
• Limited motor skills

Ideas for using randomizers (McClure, 2007a):
• Play back a variety of chants and cheers at a ballgame
• Record numbers one through 12 to substitute for rolling dice
• Announce tasks during "Simon Says" (make sure some messages do not start with "Simon Says")
• Record names of contestants in a drawing, and activate to announce the winner
• Assign seats for a holiday dinner

Two-message communication devices

Lite Tech AAC devices with two activation areas allow for simple choice making, or for communication of two different messages for users with an understanding of and ability to use symbols meaningfully. (Figure 5, page 8) Manufacturers and their devices are:

AbleNet: iTalk2

AMDi: Partner/Two

Enabling Devices: Talking Rocking Plate, Rocking Say It Play It, Rocking Two Message Communicator with Light, Rocking Two Message Say It Play It, Hip Talk Two Message, Twin Talk, Talkable II, 2-Compartment Communicator, Clip Talk

All systems except one have contact areas that lower and "click" when pressed by the user; the Partner/Two has membrane surfaces that provide no tactile feedback upon activation. The Rocking devices from Enabling Devices do not have a physical divider between the activation areas, while all other devices offer partitions between selection surfaces. Most of the two-message communicators are for tabletop use, although two options from Enabling Devices, the Clip Talk and Hip Talker, are designed for portability. Other features to consider in two-location devices include type of symbol supported (object vs. graphic), size and shape of activation area, mounting or carrying options, recording time, spacing between activation areas, angle of contact surface, and motor skills and amount of pressure required for activation.

Possible client characteristics:
• Emerging communicator
• Object or symbolic level
• Differentiates between two selections
• Indicates preferences/make choices
• Motivated by voice output
• Situational needs met by two messages
• Motor skills ranging from limited to fine
• Desire to participate in interactive situations
• Need for portability (Clip Talk and Hip Talk)
• Need device that does not call attention to itself (Hip Talk)

Ideas for using two-message devices (McClure, 2007b):
• Be "it" in a game of Duck Duck Goose (Duck/Goose)
• Control whether an activity (meal, craft, book reading, etc.) continues or ends (More/Finished, Let's do it again/I'm sick of that, let's try something else)
• Be a greeter at a store/church (Welcome to ___/Thanks for coming in today)
• Tell a joke with the question on one side and the punch line on the other
• Work on concept development (same/different, big/little, fast/slow, etc.)

Three-message communication devices

An obvious use of three-message devices is to expand the choice making abilities established with two-choice devices, or to engage in communicative interactions in which three separate messages are needed. (Figure 6, page 8) Devices available at this time are:

Enabling Devices: 3-Compartment Communicator, Compact 3-Message Communicator, Grooved Platform Communicator, Talkable III

The first three devices have areas for setting small or miniature objects to begin building skills with voice output with those using object symbols. The Talkable III is designed for use with photographs or picture symbols. Other features to consider when selecting three-location devices include the size and shape of activation areas, angle of contact surface, amount of pressure required for activation, and recording time.

Possible client characteristics:
• Emerging communicator
• Object or symbolic level
• Situational needs met by three messages
• Indicates preferences/make choices
• Motivated by voice output
• Gross motor skills
• Needs concreteness of objects or association of objects and symbols, words

Ideas for using three-message devices (McClure, 2007b):
• Use three different phrases during a simple game (Do you have a ____?/Go fish!/The winner!)
• Lead the class during transitions (Let's line up!/Remember to be quiet in the hallway./Okay, let's go!)
• Play Hide and Seek (1, 2, 3.../Ready or not, here I come!/You're it!)

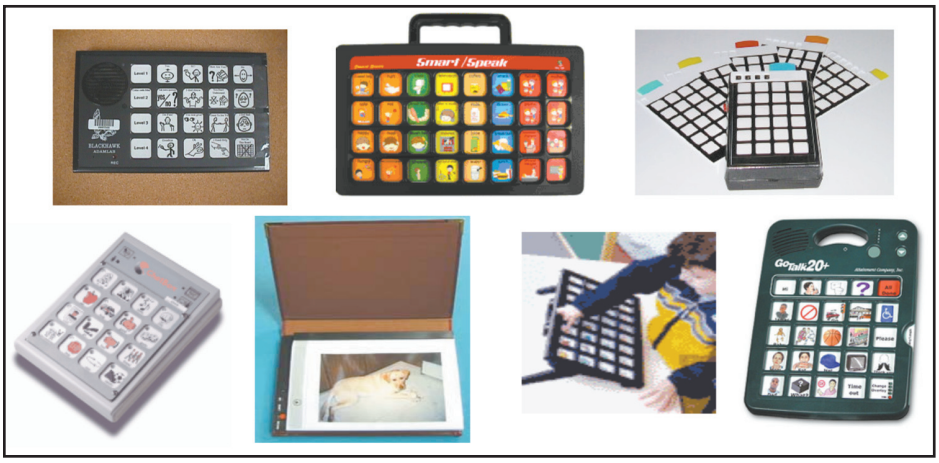

Figure 11. Top row: Adamlab's Blackhawk, AMDi's Smart/Speak, Frame Technologies' Microvoice 6/24. Bottom Row: Saltillo's Chatbox-1, Talking Photo Album, Enabling Devices' 6 level 32-Message Communicator, Attainment's GoTalk 20+.

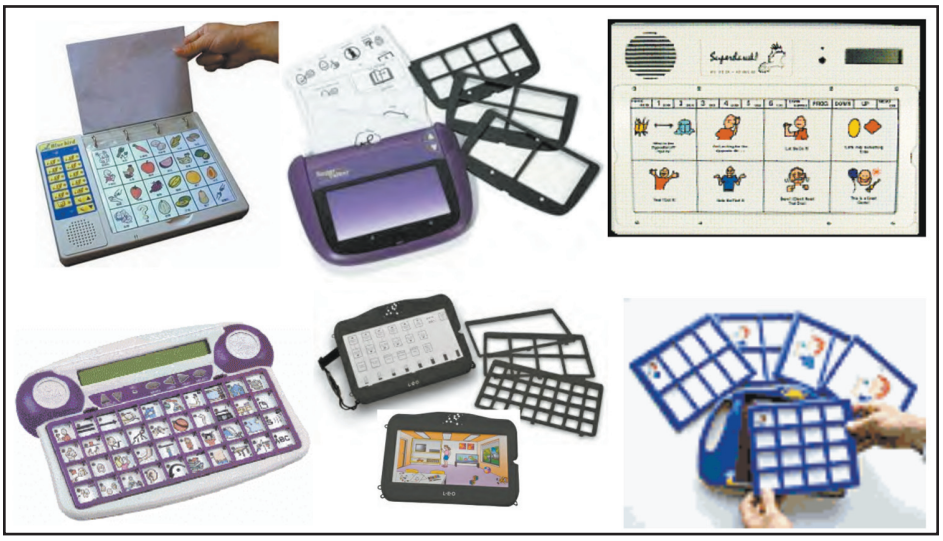

*Figure 12 Progressive communicators include the Bluebird by Unlimiter on top left, the SuperTalker by Ablenet, top center, the SuperHawk on top right, the Chatbox 40-XT by Saltillo bottom left, L*E*O* by Assistive Technology Inc, center bottom and the Seven Level Communicator by Enabling Devices.*

• Give clues during guessing games (You're getting warmer./You're ice cold!/ You've got it!)

• Participate in church traditions with three frequently used messages

Four-message communication devices

There are many options available for potential users of four-message devices. Seven companies produce four message devices. (Figure 7, page 8) Manufacturers and their devices are:

AbleNet: FL4SH

AMDi: Partner/Four, Tech/Four, Base Trainer

Attainment: GoTalk 4+, One by Four Talker, TalkBook Four

Enabling Devices: Four Message Put-Em-Around, Cheap Talk 4 series (inline, square, round, switch module), Palm Say It Play It, Basic Talk 4, Talk 4 with Levels, Hip Talk Four Messages, 4-Message Compact Communicator, 4-Compartment Communicator, Take or Place N' Talk series with 4 messages, Companion Communicator, 4 Plate Communicator, Talking Bubble with Lights and Vibration, Talking 4 Compartment Scanner, Supersized Communicator with Levels

Frame Technologies: Talkpad

Inclusive TLC: 4Talk4, Scan4

Luminaud: Companion 401 Communicator

Appearance ranges from large and colorful to small and subtle. While most are ideal for use on tabletop or while mounted, several devices (One by Four Talker, TalkBook Four, Companion Communicator) are made small for portability. At least four devices in this category offer scanning, and do so in a variety of ways. The Talk 4 offers single switch scanning. The 4-Compartment Scanner holds four small or miniature objects, and uses single or two-switch visual scanning. The Scan4 and FL4SH both have single or two-switch scanning, and both offer the option of auditory scanning. The FL4SH adds automatic overlay detection, and complete framing of the symbols in light for visual scanning.

One device, the GoTalk 4+, has a row of two "core messages" that remain constant as overlays are changed, Other features to consider when selecting four-location devices include size and shape of activation area, motor skills required for use, pressure needed for activation, feedback from selection (click of the activation surface, light, vibration), angle of contact surface, recording time, portability, availability of levels, overlay and level changing procedures, and layout (inline, 2x2, or other).

Possible client characteristics:

• Object or symbolic level

• Situational needs met by four messages at a time

• Motivated by voice output

• Motor skills ranging from limited to fine

• Need for transition from objects to symbols or photos

Ideas for using four-message devices (McClure, 2007c):

• Recite a short poem, with each line a different message

• Choose the order in which routine events occur or chores are completed

• Select the classroom or vocational station to work in next

Five- to seven-message communication devices

At least two companies make devices with five to seven messages to meet expanding communication needs (Figure 8, page 9):

Attainment: Pocket GoTalk

Enabling Devices: Carousel Communicator, 7 Message Take and Talk Go! Board, 7 Message Take and Talk Tabletop Communicator, and the Talking Bubble

The Pocket GoTalk is a portable, five-

message, direct select, membrane surface AAC device that comes with its own carrying case. All of the Enabling Devices products are designed for tabletop use or wall mounting. The Take and Talk products are activated by either removing or replacing a plastic icon holder. Other features to consider when selecting five- to seven-location devices include size and shape of activation area, motor skills and range of motion required for use, feedback from selection (click of the activation surface, light, vibration), recording time, pressure needed for activation, angle of contact surface, portability, and layout (inline, other).

Possible client characteristics:

- Symbolic level
- Motor skills ranging from limited to fine
- Motivated by voice output
- Motivated by novelty device (Carousel, Talking Bubble)
- Need for visual strategies/structures (Go! Board, Tabletop Communicator)

Ideas for using five- to seven-message devices (McClure, 2007c):

- Share rules on first day of class
- Be conductor for a group of Christmas carolers by telling them which song to sing next
- Remind Mom what to buy at the store

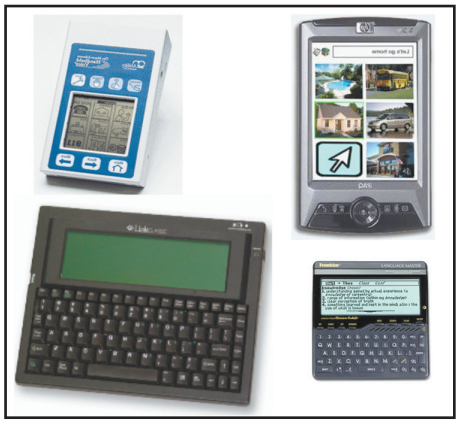

Figure 14. On the top left is the Hand Held Voice by Ability Research and on the right is the Cyrano by OneWrite. On the bottom left is the Link Classic by Assistive Technology Inc. and on the right is the Speaking Language Master by Franklin Electronic Publishers. All of these devices, usually considered high tech, meet the cost criteria for lite technology as defined for this survey.

Eight-message communication devices

Several manufacturers have devices available for users who benefit from having eight messages available at a time. (Figure 9, page 9) These companies and their devices are:

Adamlab: Hawk 2, Hawk 3, Lighthawk

Adaptivation: VoicePal 8, VoicePal 8k

AMDi: Tech/Talk, Tech/Scan 8, Tech/Scan 8 Plus, Smart/Talk, Smart/Scan 8 Plus

Enabling Devices: Cheap Talk 8, 4/8 Object Communicator, 6 Level Communicator, Talk 8

Words+: Mini Message Mate

Most offerings at this level allow for direct selection with keyboard spaces ranging from 1.25 inches to 2.75 inches. The VoicePal 8 is an exception, in that it has no built-in keyboard. All eight messages are accessed through external switches. The 4/8 Object Communicator also has no keyboard; the device has compartments into which small or miniature objects are placed, and messages are accessed via single switch scanning. The Lighthawk, Tech/Scan 8 and 8 Plus, Smart/Scan 8 Plus, and Talk 8 offer the option of single or two-switch scanning. The Tech/Scan 8 Plus, Smart/Scan 8 Plus, and Talk 8 add the option of auditory cueing.

This category of devices offers addi-

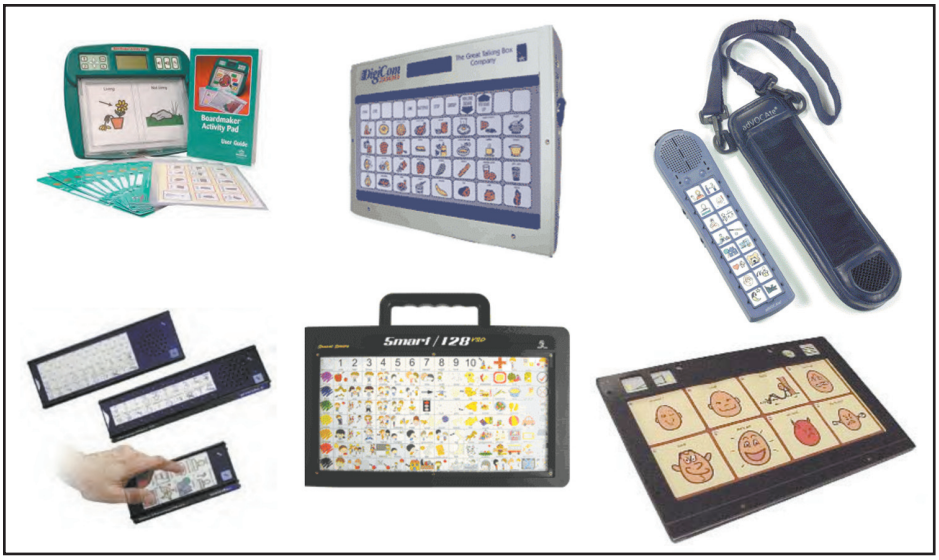

Figure 13. Other progressive communicators include from top left, the Boardmaker Activity Pad by Mayer-Johnson, the Digicom by Great Talking Box, the AdVOCAte by Toby Churchill, Message Mates by Words+, the Smart/128 by AMDi and the Talara by Zygo.

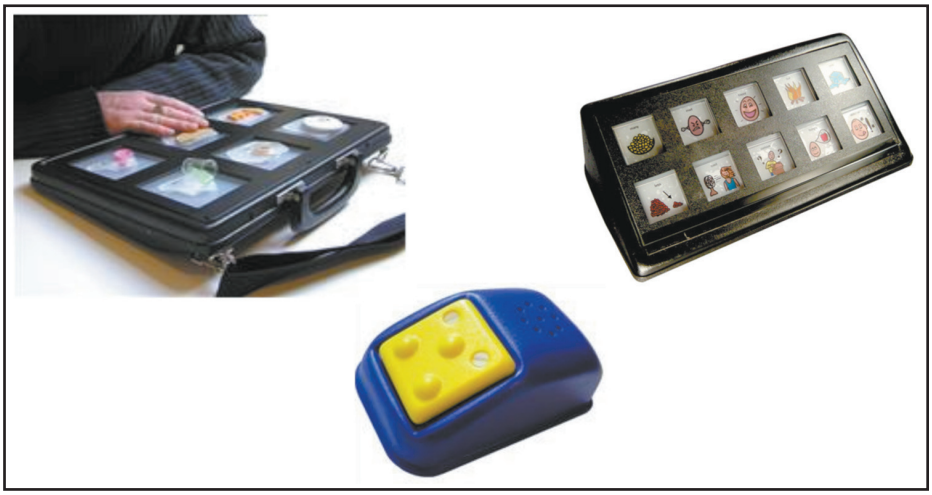

Figure 15. All of the above systems, designed specifically for person with visual impairment, are by Enabling Devices and include the Symbol Communicator for the Blind (top left), the Visually Impaired Communicator (top right) and the Auditory Communicator.

tional unique features that may be needed or desired by users. Talk 8 offers optional vibrating feedback, a possible necessity for individuals with hearing impairment. The Lighthawk frames each symbol with eight LED lights to increase certainty regarding symbol selection during visual scanning. The Smart Overlay System used by the AMDi's Smart series provides automatic overlay detection, eliminating the need for manual level changing. Other features to consider when selecting eight-location devices include shape of activation area, motor skills and range of motion required for use, pressure needed for activation, feedback from selection (click of the surface, light, vibration), angle of contact surface, portability, availability of levels, overlay and level changing procedures, and layout (2x4 or 4x2).

Possible client characteristics:

• Object or Symbolic level

• Situation needs met by eight messages at a time

• Motivated by voice output

• Motor skills ranging from limited to fine

• Need for scanning with auditory or visual cues

• Expanding communication needs

Ideas for using eight-message communication devices (McClure, 2007c):

• Select toppings for pizza or hamburger

• Describe birthday gifts to friends

• Read a short story, with each message a different page

Nine- to 15-message communication devices

For individuals who still require a limited number of choices but have expanding communication abilities, nine to 15 locations might be a good choice. (Figure 10, page 9) Manufacturers and their devices within this category are as follows:

Adamlab: Hawk

Adaptivation: VoicePal Levels

Attainment: GoTalk 9+

DTK: Listen to Me

Enabling Devices: Spinning Communicator, Phrase Maker Communicator, Hip Talk 12 with Levels

Unlimiter: Hummingbird

In this category, the Hawk, Listen to Me, and Spinning Communicator are single level, direct selection devices. The Spinning Communicator seeks to meet a need for individuals needing direct selection, but possessing minimal motor movement; the device spins similarly to a Lazy Susan, requiring slight pressure to turn and activate. The other devices in this category have multiple levels.

The Phrase Maker is a relatively new device in this category. It offers the unique feature of allowing users to sequence multiple messages and then play them as a complete phrase or sentence using the lower right hand activation area. This function can be turned off, and the Phrase Maker used as a standard multi-level device. It can also function as a single-switch auditory scanner.

Other devices in this category have additional potentially useful features. VoicePal Levels also functions as a sequencer or randomizer, and has an optional vibrating motor for tactile feedback with message activation. This device, along with the Hummingbird, provides visual and auditory scanning capabilities. Other features to consider when selecting nine- to 15-location devices include size and shape of activation area, motor skills and range of motion required for use, pressure needed for activation, feedback from selection (click of the activation surface, light, vibration), angle of contact surface, portability, availability of levels, overlay and level changing procedures, and layout of symbol array.

Possible client characteristics:

• Symbolic level

• Situational needs met by nine to 15 messages

• Understands linguistic output

• Motor skills ranging from limited to fine

• Need for portability

• Expanding communication needs

• Ability to sequence symbols to formulate a message

Ideas for using nine- to 15-message devices (McClure, 2007c):

• Record a variety of comments to cheer on friends playing video games (Cool!, Good move!, etc.)

• Be a comedian in a talent contest

• Tell everyone who should win American Idol

16- to 64-message communication devices

A number of different companies provide devices with 16 to 64 locations (Figure 11). These devices are:

Adamlab: Blackhawk

AMDi: Tech/Scan 32, Tech/Scan 32 Plus, Tech/Speak, Smart/Speak

Attainment: GoTalk 20+, Talking Photo Album

Frame Technologies: Microvoice 6/24, Turn-n-Talk, Voice-In-A-Box 6/16, Voice-In-A-Box 6/36

Enabling Devices: 6 Level 32-Message Communicator, Talking Photo Album

Saltillo: Chatbox-1

All devices in this category have multiple levels to expand communication options. Three offer scanning: Chatbox, Tech/Scan 32, and Tech/Scan 32 Plus, with the last of these providing auditory scanning capability. The Turn-n-Talk and Talking Photo Albums change levels by turning pages. The Smart/Speak, Microvoice, and Turn-n-Talk provide automatic level changing. The GoTalk 20+ has five "core messages" that remain constant, one of which might be used to request help in changing overlays. The Chatbox is an introductory device for use of Minspeak, making it a useful backup for individuals using high-tech Minspeak devices. Other features to consider when selecting 16- to 64-location devices include size and shape of activation area, motor skills and range of motion required for use, pressure needed for activation, feedback from selection (click of the activation surface, light, vibration), angle of contact surface, portability, availability of levels, overlay and level changing procedures, and layout of symbol array.

Possible client characteristics:

• Symbolic level

• Spontaneous interactive communicator

• Need for moderate to extensive number of messages

• Motor skills ranging from limited to fine

• Need for portability

• Expanding communicative needs

• Ability to sequence symbols to formulate a message

Ideas for Using Sixteen- to Sixty-Four Message Devices:

• Use as primary, comprehensive communication device

• Have levels and overlays that allow prolonged interaction about preferred topics

Progressive communicators

The name for this category of devices has been adopted from the SuperTalker Progressive Communicator by Ablenet. These are static display voice output devices that can be configured in one, two, four and more grid formats with matching keyguards. Some have the capability of using visual scene displays. Message overlays are changed manually. (Figures 11 & 12, page 10)

Ablenet: SuperTalker

Adamlab: Superhawk Six, Superhawk Twelve, and Superhawk Plus

AMDi: Smart/128, and Tech/128

Assistive Technology Inc.: L*E*O* Enabling Device Communication Builder, 4 Level Communication Builder, 7 Level Communication Builder, Laptop Communicator, and Hip Talk Plus

Great Talking Box: Digicom and Easy Talk (10 messages)

Mayer Johnson: Boardmaker Activity Pad

Saltillo: Chatbox-DX, Chatbox 40, Chatbox 40XT, VocaFlex

Toby Churchhill: adVOCAte

Unlimiter: Cardinal and BlueBird II

Words +: Message Mate 20 and Message Mate 40

Zygo: Talara-32

Features to consider include how levels are changed, overlay changing procedure, layout of symbol array, size of symbols other features such as sequencing, external device operation, and environmental controls. Does device have the capability of different levels utilizing different numbers of messages simultaneously? If there is an option for visual scene display, can the other levels be configured for standard message displays concurrently?

Potential client characteristics:

• Motivated by voice output

• Need for growing number of messages

• Symbolic functioning

• Spontaneous interactive communicator

• Moderate to extensive vocabulary

• Motor skills from limited to fine

• Ability to sequence symbols to formulate a message

Ideas for possible use of progressive communicators:

• Comprehensive communication device

• Instructional device to support learning more vocabulary or messages

• Training system for learning to sequence words into phrases or sentences

• Same as communication devices with one, two, three, four or more messages

• Diagnostic tools for evaluating use of static display for single to multiple messages

Dynamic display

These are computerized voice output devices that allow the user to change communication displays or screens containing vocabulary and or text. These systems are usually accessed through direct touch or scanning. Such devices are usually very complicated electronic pieces of equipment that fall within the category of high technology. However, the two devices included here cost less than $1500 and fall into the definition of lite tech as utilized in this survey. (Figure 13, page 10)

Ability Research: Handheld Voice

One Write: Cyrano

Feature considerations include portability, size and manner of input, visual display, as well as volume control.

Possible client characteristics:

• Motivated by voice output

• Symbolic functioning

• Spontaneous interactive communicator

• Moderate to extensive vocabulary

• Fine motor skills

• Ability to sequence symbols to formulate a message

Ideas for using dynamic display devices:

• Comprehensive communication system

• Symbolic functioning level

• Literacy skills helpful

• Visual scenes display (Cyrano)

Text-to-speech devices

These are complex voice output devices that convert text into speech. As with dynamic display systems, they are usually considered to be high tech devices, but the cost of the two devices cited here have met the definition of lite tech for the purposes of this article. The Speaking Language Master has been manufactured for use with typical individuals and is mass marketed to meet that demand. As with other technologies, the cost of the technology is far less when sold as an "off the shelf" product rather than an assistive technology. (Figure 13, page 10)

Franklin Electronic Publishers: Speaking Language Master

Assistive Technology Inc.: Link Classic

Possible client characteristics:

• Symbolic functioning

• Complex literacy skills

• Fine motor control

Feature considerations include portability, size and manner of input, as well as volume control.

Ideas for using text-to-speech devices:

• Full service communication device

• Supplement user who has speech that is difficult to understand

Devices for those with visual impairment

This category of devices includes voice output systems designed specifically for individuals with visual impairments by providing auditory, tactile or kinesthetic support or feedback. Other devices that support auditory scanning, that can accommodate three-dimensional or tactile symbols or that have special lighting should also be considered for persons with visual impairment. (Figure 14, page 10)

Enabling Devices: Auditory Communicator, Symbol Communicator for the Blind, and Visually Impaired Communicator

Potential client characteristics:

• Severe visual impairment

• Symbolic functioning

• Need for limited number of messages

• Average motor skills

• Average to good manipulation skills

Ideas for using devices for those with visual impairment:

• Use with object symbols to indicate basic needs

• Use auditory scanner to select choices or indicate preferences

• Use as any voice output device with limited number of messages (six or eight)

Summary

Though the number of lite tech devices has the potential to be intimidating, professionals in the field of AAC need not be

daunted. Armed with this summary of current offerings, listings of possible client characteristics, and ideas for using devices, interventionists have some basic tools for making decisions about this technology. Readers would be well served to remember: lite tech is always an option, and careful consideration of available devices will result in the best possible outcomes for all AAC users.

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Resources

Ability Research, PO Box 1721, Minnitonka, MN 55345; Phone: 952-939-0121; Web site: <www.abilityresearch.com>.

Ablenet Inc., 1081 Tenth Avenue S. E., Minneapolis, MN 55414; Phone: 800-322-0956; Web site: <www.ablenetinc.com>.

Adamlab, 55 East Long Lake Rd. Suite 337, Troy, MI 48085; Phone: 248-362-9603; Web site: <www.adamlab.com>.

Adaptivation, Inc., ISU Research Park, 2225 w. 50th St., Suite 100, Sioux Falls, SD57105; Phone: 800-723-2783; Web site: <www.adaptivation.com>.

Advanced Multimedia Devices, 200 Frank Road, Hicksville, NY 11801; Phone: 888-353-AMDI; Web site: <www.amdi.net>.

Assistive Technology, Inc, 7 Wells Ave., Newton, MA 02459; Phone: 800-793-9227; Web site: <www.assistivetech.com>.

Attainment Corp., PO Box 930160, Verona, WI 53593-0160; Phone: 800-327-4269; Web site: <www.attainmentcompany.com>

Augmentative Resources, 8331 Epicenter Blvd., Lakeland, FL 33809; Phone: 877-471-1863; Web site: <www.augresources.com>.

DTK Enterprises, Inc., 1954 First Street, #155, Highland Park, IL, 60035; Phone: 847-579-1309; Web site: <www.listentome.biz>.

Dynavox, Toby Churchill, 2100 Wharton Street, Suite 400, Pittsburgh, PA 15203; Phone: 866-396-2869; Web site: <www.dynavoxtech.com>.

Enabling Devices, 385 Warburton Avenue, Hastings-on-Hudson, NY 10706; Phone: 800-832-8697; Web site: <www.enablingdevices.com>.

Frame Technologies, W861 Pearl Street, Oneida, WI 54155; Phone: 920- 869-2979; Web site: <www.frame-tech.com>.

Franklin Electronic Publishers, One Franklin Plaza, Burlington, NJ 08016; Phone: 800-525-9673; Web site: <www.franklin.com>.

Great Talking Box Co., 2245 Fortune Dr., Suite A, San Jose, CA 95131, Phone: 408-456-0133; Web site: <www.greattalkingbox.com>.

Inclusive TLC, 315 Wootton St, Boonton, NJ 07005; Phone: 800-462-0930, Web site: <www.inclusivetlc.com>.

Luminaud, Inc., 8688 Tyler Boulevard, Mentor, Ohio 44060, Phone: 800-255-3409, Web site: <www.luminaud.com>.

Mayer-Johnson Company, PO Box 1579, Solana Beach, CA 92075; Phone: 800-588-4548; Web site: <www.mayer-johnson.com>.

Object-Symbol Resource LLC, P.O. Box 68798, Portland, OR 97268; Phone: 888-794-3976: Web site: <www.objectsymbol.com>.

One Write, 3750 State Road 37 East, Lancaster, Ohio 43410; Phone: 740-654-2128; Web site: <www.onewriteco.com>.

Pro-ed, 8700 Shoal Creek Boulevard, Austin, TX 78757; Phone: 800-897-3202; Web site: <www.proedinc.com>.

Saltillo Corporation (Unlimiter), 2143 TR112, Millersburg, Ohio 44654; Phone: 330-674-6722; Web site: <www.saltillo.com>.

Tash, Unit 1, 91 Station Street, Ajax, Ontario, Canada L1S 3H2; Phone: 800-463-5685; Web site: <www.tashint.com>.

Words +, 1220 West Ave. J, Lancaster, CA 93534; Phone: 800-869-8521; Web site: <www.words-plus.com>.

Zygo Industries Inc., PO Box 1008, Portland, OR 97207-1008; Phone: 800-234-6006; Web site: <www.zygo-usa.com>.

References

Beukelman, D.R. & Mirenda, P. (2005). Augmentative and alternative communication: Supporting children and adults with complex communication needs (3rd ed.). Baltimore: Paul H. Brookes Publishing Co.

Carroll, M., & Phillips, B. (1993). Survey on assistive technology abandonment by new users (Cooperative Agreement No. H133E0016). Washington, DE: National Institute on Disability and Rehabilitation Research.

Cook, A. E., & Hussey, S. M. (2002) (2nd ed.) Assistive technologies: Principles and practice. St. Louis, MO: Mosby.

Cotts, M. (March 2007). Low tech AAC for people with ALS. Paper presented at California State University at Northridge's Annual International Technology and Persons with Disabilities Conference, Los Angeles, CA.

Light, J. (1997). "Communication is the essence of human life": Reflections on communicative competence. Augmentative and Alternative Communication, 13, 61-70.

Mathy, P., Yorkston, K.M., & Gutmann, M.L. (2000). AAC for individuals with amyotrophic lateral sclerosis. In D.R. Beukelman, K.M. Yorkston, & J. Reichle (Eds.), Augmentative and alternative communication for adults with acquired neurologic disorders (pp. 283-232). Baltimore: Paul H. Brookes Publishing Co.

McClure, M.J. (2007a). Enhance communication and participation with randomizers. Unpublished manuscript.

McClure, M.J. (2007b). It takes two: Ideas for using two-message communication devices. Self published manuscript.

McClure, M.J. (2007c). Making multiple messages meaningful: Functional activities for 3, 4, and more message lite tech devices. Self published manuscript.

Phillips, B. & Zhao, H. (1993). Predictors of assistive technology abandonment. Assistive Technology, 5(1), 36-45.

Rush, E.S. (2005a). Lite tech solutions for ease in using augmentative and alternative communication. Self published manuscript.

Rush, E.S. (2005b). Using sequence communicators functionally. Self published manuscript.

Rush, E.S., & McClure, M.J. (2007). A world of options for nonvoice aided communication. Unpublished manuscript.

Rush, E.S., & McClure, M.J. (2007). Communication devices costing less than $1500. Self published manuscript.

Scherer, M.J., & Galvin, J.C. (1994). Matching people with technology. Rehab Management, 7(2), 128-130.