



## Technology to Generate Speech

*By Andrew Leibs*

Few disabilities are as frustrating and isolating as impaired language function – especially when the mind works, but can't form the words needed to communicate or express thoughts.

Many conditions, including ALS, aphasia, autism, cerebral palsy, paraplegia, and strokes, can impair speech to varying degrees.

Assistive technology provides ways to give voice to those who cannot speak. Dedicated speech generating devices and mobile apps that replicate language functions can offer immediate communications access.

Following are profiles of four hardware and five software solutions that can restore or enhance speech.

### Speech Generating Devices

Speech generating devices (SGD) are tablet-sized tools that provide high-tech augmentative and alternative communication (AAC) options, including tap-to-speak touch screens, image libraries, and text to speech. SGDs are also accessible in a variety of ways, including via switches, eye gaze systems, and customizable keyboards.

Like tablet computers, SGDs support autodialing, web browsing, social media management, and email. They also provide access to environmental controls. The cost (all or part) of some SGDs may be covered by Medicare.

#### **DynaVox Maestro**

The DynaVox Maestro uses a touch screen, text-to-speech, a communication

framework called InterAACT, and proprietary software (Boardmaker) to help users create and deliver messages. Boardmaker is a platform for creating content using symbols rather than words. Its symbol sets are extremely popular among special education teachers, who use them to create both class materials and activities for non-verbal children. Users tap the images and the Maestro displays or reads the words aloud. Boardmaker and Speaking Dynamically Pro are preloaded on every standard Maestro. The Maestro is available in two versions: a dedicated version designed just for speech output that only supports DynaVox software, and a standard version that can be used as a PC and supports additional Windows 7 programs.

### **Lingraphica**

Lingraphica specializes in SGDs for persons with aphasia, a neurological disorder caused by damage (often from a stroke) to the portions of the brain that process language. Lingraphica's AllTalk is a customizable, laptop-based SGD that offers an extensive vocabulary of icons and "type-and-talk" functionality. A built-in camera enables users to add pictures of people and objects to their vocabulary. The AllTalk also comes with training and practice videos and an extensive collection of oral motor exercises to support learning at home or with a speech therapist. Lingraphica's TouchTalk SGD provides the same functionality as the AllTalk, but on a lightweight touch-screen tablet designed for portability.

### **Prentke Romich**

Prentke Romich Company (PRC) devices emphasize language development enabling spontaneous communication; i.e., beyond the mere voicing of words. Their mission is to help users achieve their potential in educational, vocational, and personal pursuits.

- **ECO2** (\$7,895): PRC's most advanced AAC device features "one-touch" transition from computing to speech to make communication faster. ECO is pre-programmed with PRC's Unity language, a large 14.1" XGA TFT display, and larger keys to make access easier for users with visual impairments or mobility limitations.
- **SpringBoard Lite** (2,595): SpringBoard Lite is a portable AAC device – among PRC's easiest to use – that provides Unity language access in configurations of 4, 8, 15, and 36 symbol locations. SpringBoard features a simplified Toolbox, "Exploration Wizard," built-in media player, infrared environmental control functions, and Bluetooth connectivity.

## **Tobii I-12 & I-15**

The Tobii I-Series (I-12 and I-15) facilitate computer access, environmental controls, speech, and long distance communication and have a built-in eye tracker to support both touch and gaze interaction. Communication support includes speech, e-mail, text messaging, chat, Skype, and phone calls. Tobii I-Series devices have one camera facing forward and a second facing the user to facilitate face-to-face communication online. Network inputs include USB, HDMI, Bluetooth, and Ethernet. Both devices are built to withstand everyday use, whether they're carried around or mounted on a wheelchair. The units feature scratch resistant [Gorilla Glass™](#), an impact-resistant [solid-state hard drive](#) (SSD), and no cables to get caught on things.

## **Mobile Apps**

Mobile apps can help children and adults with speech disabilities to communicate using an iPad – a tablet that's proven extremely effective in engaging young children with autism.

Apps replicate the main function speech generating devices provide: enabling users to talk by tapping on images and typing words voiced via text-to-speech.

Advantages of mobile apps include cost savings – often less than \$100 as opposed to \$2,500 for a speech generating device. Apps are also quickly becoming more sophisticated and specialized. One can download a free version for instant communication and upgrade functions as language needs evolve.

## **Able Jr**

Able Jr is designed to help young children with speech disorders and developmentally challenged adults to interact more effectively with family members, teachers, and caregivers. The app, developed by AbleVox, displays 750 basic vocabulary words (with images) in 26 categories and in 20 languages. Tapping a picture plays the corresponding audio (in Acapela voices whose pitch and speed you can modify) and places the word in a “Sentence Formation Box” for generating spontaneous speech. You can import images from multiple sources. The touch screen and large pictures make interaction easier for kids with impaired motor skills.

## **CommunicAide**

CommunicAide, designed by Hope4Speech, features a “tap-to-voice” design to help users communicate needs and feelings in different settings by combining a

large image library with text-to-speech and the ability to customize content with one's own text, pictures, and voice. Unique features include a pop-out "Body Chart and Pain Meter" that has made the app successful in a variety of settings, including clinics, critical care units, skilled nursing facilities, and at home. Other features include a customizable photo field and the ability to save favorite phrases. Download a free demo on [iTunes](#) or buy the Professional version for \$69.99.

### **InnerVoice**

InnerVoice animates user photos to enable them to see themselves speaking words and phrases to learn language and social skills. The technology, co-developed by iTherapy, LLC and MotionPortrait, is designed to provide a more personal approach to communication. The idea behind InnerVoice is that seeing oneself engaging in correct behavior, whether speaking words or responding appropriately, creates a more exciting interaction that encourages learning for children with autism. Using animated avatars generated from photos rather than static images is also thought to do more to stimulate areas of the brain – especially mirror neurons and the Fusiform gyrus – shown to be deficient in persons with autism.

### **RocketKeys**

[RocketKeys](#) enables those with impaired speech to customize [iPad keyboards](#) to type (i.e. talk) more quickly and efficiently. Toronto-based MyVoice developed RocketKeys to aid users who want to generate a high volume of spontaneous speech, but who find [QWERTY keyboards](#) difficult to use. RocketKeys provides a range of keyboard options, including the standard layout, alphabetical, and a specially created one called Optimus, designed for typing with the fewest possible hand movements.

### **Resources**

Speech Generating Devices

<http://assistivetechology.about.com/od/AugmentativeCommunication/tp/Speech-Generating-Devices.htm>

Autism Communication Apps for iOS Devices

<http://assistivetechology.about.com/od/AugmentativeCommunication/tp/Autism-Communication-Apps-for-iOS.htm>

Top 10 AAC Apps for iPad

<http://assistivetechology.about.com/od/AugmentativeCommunication/tp/Top-10-Alternative-And-Augmentative-Communication-Aac-Apps.htm>