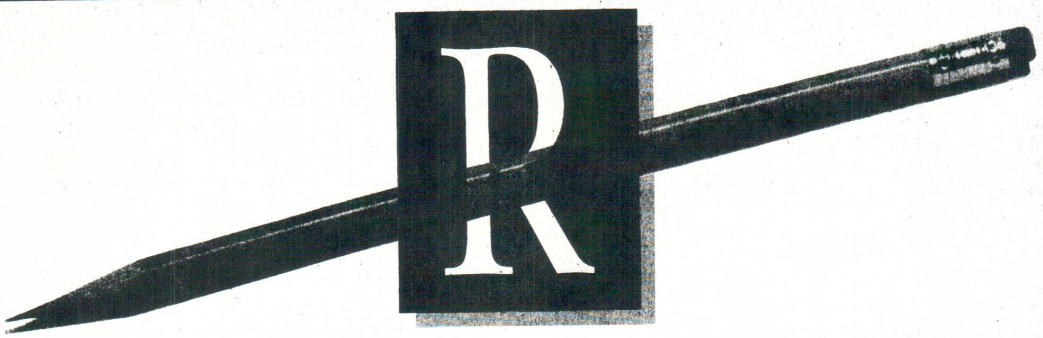
THE RESOURCE CENTER



By MARGARET MORABITO

In many of our nation's schools, the mainstream student population is benefiting from the use of computers (of whatever brand) and the current wealth of educational software. But, what about our handicapped and special-needs students who cannot speak, see, or move their arms and legs? Do they also share in this wealth?

The answer, unfortunately, is, "Not yet." There are several reasons for this lack of support. Many parents and schools cannot afford the special equipment that is promoted for the handicapped. Furthermore, input devices and software written for special-needs students are very costly.

The expense could be reduced considerably, however, if people would only realize that low-cost computers, such as the C-64 and VIC-20, can do as much, if not more, than the high-priced equipment.

Special input devices can also be made for the C-64 and VIC-20 (with a little help from your friends) for only about $5 in parts. While there is not a huge library of commercial software to fit the requirements of handicapped users, there is a growing body of public domain software that is written specifically for Commodore computers.

Inexpensive computers like the Commodore can be a significant contribution to the education of handicapped and special-needs students.

Programmer Don Peterson

Let me introduce Don Peterson, a retired electronics engineer, now living in Tempe, Arizona, who has embarked on a second career. For three years, he has been involved in developing C-64 and VIC-20 software programs for the education of the handicapped. He also is skilled at constructing and modifying input devices for students with special needs.

Don has so far written over 60 programs specifically for severely handicapped users. His first endeavor was a writing program that allows the selection and input of keyboard characters through an on-off switch controlled by the foot or chin. The characters are printed on the screen until a sentence or phrase is completed, at which time the phrase can either be spoken by a speech synthesis program or printed to a printer.

This program is now being used in all of the private schools in Peterson's area. Eighteen-year-old Holly Waite, who is voiceless and severely physically handicapped, was the first school student to use Don's writing and speaking program.

Says Peterson, "My program literally turned that girl's life around. She was 18 years old; she was very bright, but had no way of communicating." Since Holly met Don in 1985, she has learned to write letters and to speak through the computer, and she even has plans to write a book.

Don has written variations of this program to accommodate the blind. A five-year-old boy who is blind, mute and afflicted with cerebral palsy uses a program that speaks to the child, who then selects the characters he wishes to print to the screen or a printer.

Another program allows a person with no voice and very limited movement to make a telephone call. This program allows for chatting and for communicating pre-recorded messages with the use of a speech synthesizer.

Peterson has also written a spelling program that can speak the words to a blind user. A word is displayed on the screen and spoken; then the user spells the word by selecting characters with the on-off switch. This is a variation of the flash method of spelling that I discussed last month.

Five-year-old Billie Carpenter was unable to speak or see. Now, through the use of Don Peterson's "I want" program, she can communicate her needs and desires. The program has a series of menus, from which she can make selections by pulling and push-

ing on a joystick, enabling her to "say" 32 sentences.

The Software's Requirements

To start with, there is no sophisticated and expensive hardware involved. The concept involves a switch that plugs into the joystick port and takes the place of a joystick fire-button. Peterson's engineering background has been helpful; he buys the necessary parts and then modifies them himself to accommodate the particular needs of the students he works with.

The signal the student transmits through the switch is incorporated as input into the software program. Students can control the on-off switch mechanism with a finger, the side of a hand, the chin or the toe. The switch can be modified so that even just a puff of air blown into an amplifier can trigger it.

Peterson uses a Radio Shack on-off foot switch (part #44-610) that costs $2.99. It is a 2½-inch square box that can be modified as needed by removing springs to make it easier for the student to control and by adding a foam rubber pad for attaching under the chin.

He has also built keyboard plates for children who can use one finger or a head stick to press the keys. These plates overlie the keyboard and assist the user's aim in hitting a particular key. Peterson built eight of these keyboard plates, which are commercially available for $100 each, in one afternoon for a total cost of only $5!

"Almost everything on the market in this business is terribly expensive," says Peterson. "A $3000 dedicated computer doesn't do a tenth of what I'm doing with the Commodore 64."

For the sightless students, a voice synthesizer (either disk- or cartridge-based) is needed so that the computer can speak. Don Peterson has been using two speech synthesizers for the C-64 and VIC-20 that are no longer being produced, but there are still available copies of one of them, the SAMS program.

Several other speech synthesizers, listed at the end of this article, are currently on the market. Peterson's programs can be modified to work with these synthesizers.

VIC-20 users will be happy to know that there is a speech synthesizer being made for that valuable computer. It is produced by Talk Tronix, Inc. from El Toro, California. (See address at end of article.)

A Battery-Operated VIC-20

It is rather easy to create a battery-operated VIC-20 that can be attached to a wheelchair. For example, five-year old Billie Carpenter, who is learning to talk and print with her VIC-20 using Don's programs, has also been able to take her computer to school on her wheelchair, enabling her to communicate more easily.

The VIC-20 comes with a nine-volt transformer. All you need is a 12-volt battery and a nine-volt regulator. You can get the latter for about $2. Many people already have the 12-volt battery to run their wheelchairs.

How To Get Don's Programs

Although his retirement community has donated some money to help him with his hardware and software development, Don Peterson is still running his non-profit operation on a shoestring. He is becoming more involved with demonstrating to individuals and to schools in his area how useful the C-64 and VIC-20 are for enabling severely handicapped people to communicate and learn. He is also undertaking the development of software for the mentally retarded who may not be physically handicapped.

Don is providing all of his programs *free* to anyone who wants them. He has also generously donated the programs to QuantumLink, so that those users can download directly from the network. You can get his entire library on two disks by writing to: Donald Peterson, 2645 E. Southern A326, Tempe, AZ 85282. He asks only $3 per disk to cover the cost of the disk and mailing. He can be reached by phone at 602-831-3519.■

If you're using Commodore computers for educational purposes (at home or in school) and would like to share your experiences through The Resource Center, write me a letter detailing the equipment you're using, subject areas being taught, grade level or age of your students, software that you're using and any other information you feel like including.

Also, if you'd like to donate public domain educational programs to The Resource Center for sharing with other educators or parents, please send along a disk with a brief description of the program. Send correspondence and disks to:

Margaret Morabito
The Resource Center
c/o RUN *magazine*
80 Elm St.
Peterborough, NH 03458

You can also leave mail in my on-line mail boxes: CompuServe (70616,714) or QuantumLink (MARGM).

Table 1. *Speech synthesizer manufacturers.*

VIC-20 synthesizer
Talk Tronix, Inc.
27341 East Ridge Drive
El Toro, CA 92630
714-768-4220

Voice Master ($89)
Covox, Inc.
675-D Conger St.
Eugene, OR 97402
503-342-1271

Hearsay 1000 ($79.95)
Hearsay, Inc.
1825 74th St.
Brooklyn, NY 11204
718-232-7266

Comvoice ($99)
Personal Speech System ($395)
Votalker ($99)
Votrax, Inc.
1394 Rankin
Troy, MI 48093
313-588-2050