Commodore's New Speech Module: Magic Or Technology?

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Until very recently, speech simulation devices for home use were not much more than curiosities—and very expensive ones at that. Two years ago, a speech synthesizer box cost around $300, and was only useful to the person willing to invest a large amount of time into learning the complex programming skills needed to coax semi-intelligible words from it.

A year ago the prices dropped somewhat, and to make your synthesizer speak you now had a rather cumbersome "editor" program based on creating words from parts of speech known as phonemes. If you had a good ear, and a knack for phonics as a child, you could construct phrases and speeches to amaze your spouse and amuse your friends.

Like the original Model T Fords, your computer's voice came in any style you wished as long as it was monotone—with little or no variation in pitch or inflection. It was also difficult to have anything else going on while the computer was orating, since the speech synthesis methods ate up huge chunks of the computer's memory.

As a Commodore owner, I wish that Commodore could take credit for being the first to come up with the revolutionary technology that is changing the way that people think about personal computer voice synthesis—but the laurels go to Texas Instruments. The type of chip that was designed for *Speak and Spell*, and later used with the TI-99/4A, was refined and perfected by a group of wizards in Texas. It is not an exaggeration to say that when *Speak and Spell* hit the market, it set up a ripple that has become a sizable wave, and before it is finished, may very well become a veritable tsunami of new ideas and products "speaking" in schools and homes, factories and businesses.

Commodore did the next best thing to inventing the technology—they hired a chief wizard and some of his friends from Texas Instruments. Richard Wiggins was installed as head of the Commodore Speech Technology Division in Texas to design and perfect a speech module for Commodore computers. The result is the Commodore Magic Voice Speech Module, and I think that Commodore users will be very pleased indeed when it becomes widely available this summer.

Modeled On The Human Voice

Wiggins used a chip that is based on a technique called Linear Predictive Coding (LPC)—a totally different process than that of the Votrax chip that most of us are familiar with from the speech synthesizers of years gone by. In general terms, the LPC process is designed to model the vocal tract, to which is added the actual digitized recording of a real human voice. After the digitized recording has been entered, it's then possible to analyze and change the pitch, volume, and frequency content of the signal—and generate very high quality speech. It is the LPC method that allows the

Magic Voice to be able to speak as a variety of characters: man, woman, child, or monster. And all may be programmed from one set of data.

Asked why the LPC technique was chosen, Wiggins said, "We didn't want to produce a 'curiosity,' something that is just purchased as a gimmick." He elaborated, "We wanted a workhorse speech module that would do *useful* things—teach young people to read, or enable them to learn foreign languages."

The Magic Voice itself has a few surprises in store for Commodore users who up to now have only seen Votrax-based units or the clever, disk-based SAM for their computers. Magic Voice is as clearly understandable as the magic toys from TI—but it speaks with the voice of a woman when you install it in your 64. This may or may not be a revolutionary move on Commodore's part, but it is an educationally sound decision. Numerous studies have shown that at the elementary school level, children respond better to, and learn significantly more, with a woman's voice instructing. According to a spokesperson at Commodore, "Education is one of the major uses we foresee for the Magic Voice."

Added Commands

The voice comes with a built-in vocabulary of 235 phrases, and adds additional commands to Commodore BASIC to make it easily programmable. It's programmed using complete words—or a number that is associated with each word—and the most useful added command is "SAY." SAY is used with syntax almost identical to PRINT, with a few important exceptions. In a program (or direct mode), you cannot use a string of vocabulary words with SAY:

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10 SAY "HI THERE"
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will not work. You must set up a separate statement for each word, as in:

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10 SAY "HI":SAY "THERE"
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A way around this is to use DATA statements or look-up tables.

Another new entry on the BASIC list is the RATE command, which varies the speed at which the word is spoken. This is a very important capability—you only have to listen to the variations in speed in your own speech to understand how important. Careful use of the RATE command can make all the difference in the naturalness and understandability of the sentences you program with Magic Voice.

RDY (ready) is a command that allows you to check from within a BASIC program to see if the module is "ready." Wiggins had some advice to programmers about using the RDY feature: For your program to work on systems that do not have the module inserted, you must set RDY to zero, and save the program *without* the module plugged into your 64. The program will then run with or without the Magic Voice.

Software Support

Commodore has also developed talking software for the Magic Voice. Two Bally Midway arcade games, *Wizard of Wor* and *Gorf*, will soon be talking back to their owners. These games illustrate the character-voice capability of the module as they sound off with phrases sure to inspire competitive zeal. Included is the most sinister and bone-chilling laughter I have ever heard.

Next comes the first in a series of programs for preschoolers starring the Commodore bee. Dubbed *A Bee Cs*, this cartridge program teaches children to recognize both capital and lowercase letters. Kids use the joystick to fly the bee to the letter as directed by the voice—and when "Terrific!" is heard for a job well done, little faces shine with a glow of confidence. You may have guessed that my kids liked it. Available soon will be *Spelling Bee* and *Counting Bee*.

The Magic Voice module plugs into the game port (not the user port) and has a slot in the top to allow you to "piggyback" cartridges. All the software designed for the module is slated to appear on cartridge.

Although phoneme-based speech construction and text-to-speech are well within the capabilities of the Magic Voice, it will be a few months until software unlocking these features is available. A prototype of the text-to-speech program was introduced at last January's Consumer Electronics Show.

The impressive capabilities of Commodore's Magic Voice seem to prove that speech technology is now emerging from a long infancy, and is taking the first strides toward the day when we will not remember that, once upon a time, our computers could not speak.