Taking new keyboard concepts a step further

Editor:

In "Bringing Manual Input Into the 20th Century: New Keyboard Concepts" (March 1982), E. B. Montgomery asks how one would go about "designing a new keyboard if there were no preconceived notions about manual input methods." In the body of the article he is then primarily concerned with optimizing the relative locations of the characters and the length of travel of the fingertips across the board. Inherent in the discussion is the assumption that there is no possibility other than an arrangement of four rows of characters in an approximate plane, with each key corresponding to one or two characters.

Although it would be extremely difficult to build a mechanical typewriter to decode multiple key pressings for the selection of individual characters, such decoding is electronic child's play in the 1980's. If we are to make a major effort to standardize a new keyboard and retrain millions to a new touch-typing system, let us at least consider that parallel input offers an opportunity to reduce finger motion delay to a minimum.

As a top-of-the-head example, if each hand of the operator were to grasp a cylindrical four-bit input device, the only motion required of the eight fingertips to select from 256 characters would be tightening. A thumb or the heel of the hand could provide pressure for a strobe. If fingertip travel is indeed the limitation to speed of manual input, then such an approach must be explored. Its possibilities are more obvious on a numerical keypad, so that should probably be examined first. It is also obvious that most-used words or keywords could be selected by the unused thumb employed as a shift key, and that other motions and pressures could increase the choices still further.

The speeds currently achieved by high-efficiency typists are so great that perhaps it is only possible to hope for an increase in speed and accuracy by the average user with limited skill and training. Experimentation should include visual and audio feedback, and questions like:

- Would it be too difficult to acquire proficiency with a coded input?
- Would nervous-system limitations outweigh physical limitations?
- Would the coded input and the isometric exercise be uncomfortable in the long run?
- How would one optimize the coding?
- What is the fastest and most foolproof way to provide the data-valid signal?
- For comfort, the input might be arranged like the handlebars of a bicycle. Should their positions be individually adjustable or movable during use? Over what range? Should elbow rests be provided? Wrist rests?

Less convenient in many situations but certainly faster and more accurate than speech is ever likely to be, the parallel hand input appears initially to be faster than anything except direct connection to the nervous system. Or perhaps direct interpretation of EM fields around the brain?

Edward Massell
Princeton, N.J.

---

Errors in July figures and table pointed out

Editor:

In the July 1981 issue of Computer there were several errors in the documentation of "Programming Languages and Direct-Execution Computer Architecture" by Yaohan Chu and Marc Abrams of the University of Maryland.

In Table 1, page 24, there is an entry "NSTACK.IF" in the first and third columns. This should have been "NSTACK.TYPE."

On page 26, Figure 5, there were several errors. "SDM_PTR.TYPE" and "SDM_PTR.PTR" should have been "SDM_LOCN.TYPE" and "SDM_LOCN.PTR," respectively. In columns 1 through 4, opposite the entry "DAM," the heading "PM_LOCN" should have been "DM_LOCN." Opposite "NSTACK," the entries in columns 3 and 4 should have been interchanged.

Figure 7, page 30, referred to "NEXT_SYNTAX." This should have been "NEXT_TOKEN."

Thank you for having presented this interesting article. It was very enlightening.

Donalee Flaningam
Computer Science Department
Central Michigan University
Mount Pleasant, Mich.

---

Work is underway on command language specification

Editor:

In regard to the February "Open Channel" on the need for a standardized command language, there is an open-membership ANSI committee, X3H1, which is chartered to develop a command language standard. A requirements document was published in December 1979, and the committee has, since 1980, been constructing a command language specification.

Details on the committee's work are available from the chairman:

Lance Miller
Honeywell Information Systems
PO Box 6000
M. S. 228
Phoenix, AZ 85005
(602) 866-6164

Norman Engelberg
Silver Spring, Md.

---

To be considered for publication, a letter to the editor must be accompanied by a statement giving Computer permission to publish that letter.

May 1982