WHITHER TELEDISPLAY CONTROL STANDARDS?

Teledisplay Workshop Report
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The workshop was held at the Quality Motel in Houston, Texas, on November 20 and 21, 1970, immediately following the FJCC, under the joint sponsorship of the Communications Systems Committee of the Communications Technology Group and the Application to Management Systems Committee of the Computer Society. The twenty-five participants, from both government and industry, represented terminal and system manufacturers, on-the-job users of teledisplays, and representatives of interested standards organizations.

The workshop was held to allow manufacturers and users of teledisplays their views and ideas to begin forming a set of standards which, if accepted by the industry, could help minimize the operating difficulties encountered today due to arbitrary assignments of function and display codes which are clearly defined for a teletypewriter but not for a teledisplay.

Eric Swarthe (NBS) requested that the workshop define about sixteen important teledisplay functions common to all units and installations to serve as a guide for current and future designers and to form the core of a standards proposal to the ANSI X3L2 committee on standards and to National Bureau of Standards.

Tom Fitzsimons (BTL) presented a brief history of ASCII and then described a proposal from the X3L2 committee concerning the extension of the standard ASCII character set through the use of an additional dimension of coding, wherein different, though not necessarily dissimilar, clearly defined sets of display graphics and functions may be invoked using a clearly-defined and commonly-accepted pair of control codes, probably "SO" and "SI," with a three-character sequence code being used to uniquely identify each distinct character set or "page."

During the ensuing discussion concerning the multitude of existing codes in use for communication with a system monitor or operating system, Mr. Fitzsimons pointed out the widespread use of "OFF" to indicate "done sending," making it somewhat difficult to enter more than one line of data at a time.

Gary Bard (Delta Data Systems) stated that specialization and non-standard terminals can mean a captive market for a manufacturer, and his company would rather sell a solution to a specific problem than a port to a standard data base. Hank McDonald (BTL) countered that one terminal should serve all needs, implying standardization or at least clearly-defined functions. Most of the control codes in ASCII are clearly defined for the teletypewriter but most do not apply exactly to a teledisplay, though many are similar, nor are there enough to cover all of the desirable possibilities of data manipulation inherent in such a device.

Some of the manufacturers brought displays with them, and a user unfamiliar with any of them dramatized the problem by experiencing different difficulties with each when used on his own familiar time sharing system. Experiments at the workshop by other users showed that this was a general problem but they thought that the problem was not due solely to the equipment. The time sharing system programmers work within the framework of ASCII but must use their own initiative when faced with a need not provided for in ASCII, as there is, as yet, no industry-wide standard for additional features.

Mr. McDonald, looking towards the future, envisioned a teledisplay as helping the user to "fill out a form" to prepare a job for the more efficient batch mode of operation, introducing the growing need for asymmetrical data sets.

After lunch, four special-interest study groups were formed to allow more detailed analysis of some of the problems and proposed solutions currently associated with teledisplays. These met separately throughout the afternoon and evening, and reported to the workshop the next day.

Lyn Hobrecht (IBM) reported for the workshop's Communications Group, emphasizing the conceptual separation of data from the communication link controls, and calling for a standard method of accessing an extension set or "page" of non-ASCII codes and controls. Similar codes might occupy the same position on different "pages" for programming convenience, if desired. A single code might be defined to effect multiple functions such as "New Line and Shift to Red Display." These might be generated with a general extension code followed by modifiers.

Mike Bergamo (Hazeltime), reporting for the Edit Controls Group, affirmed the statement that there is a conceptual difference between teleprinters or teletypewriters and teledisplays, and that separate codes should be used for similar, though not identical functions. He submitted the following list as the basic display functions required by a simple teledisplay, along with suggested current ASCII codes:

- Clear Screen to Cursor (SUB)
- Transmit (NAK)
- Print to Cursor (SUB)
- Device A On (DC1)
- Device A Off (DC3)
- Device B On (DC2)
- Device B Off (DC4)
- Nondestructive Move Cursor Up (FS)
- Nondestructive Move Cursor Right (GS)
- Nondestructive Move Cursor Down (RS)
- Nondestructive Move Cursor Left (US)
- Escape into New ASCII Page (ESC)

Selective editing and protection would be the first degree of extension. If these were accepted as standard, the teledisplay manufacturer should either comply with the exact definition of each function or else ignore the function completely. No substitutions would be made for other codes or functions. He theorized that if a small set of codes were standardized, the market demand would expand the set and would police the standard.

Roland James (Video Systems Corp.) then spoke for the Input and Cursor Position Group, stating that we must define and classify a primitive set of operations or functions for the teledisplay, such as "Move Cursor Up." Wraparound at the end of a control function might be impossible definition of movement on a screen, with the software adjusting to non-conforming hardware. The teledisplay screen may be thought of as a small moveable "window" opening onto a large area of data, any part of which may be accessed through "scrolling" up, down, left, or right. He recommended that the keyboard be locked out whenever the cursor vanished from the screen, except for an escape sequence.

Jim Beatty (DEC), of the Privacy, Peripherals, and Data Base Group, said that he would like to be able to take a terminal and communicate with any other terminal, recognizing the existence of bit-pattern codes other than ASCII. The following five questions must be answered somewhere along the line before meaningful data may be exchanged:

1. How do I talk to you (code, etc.)?
2. What (kind of terminal) are you?
3. Which (of all the various specific kinds of that terminal) are you?
4. Who (which individual) are you?
5. Why (what you want to do) are you?

Mr. McDonald approved this sequence of handshaking, saying that it was good for both a Start and a Restart, and that it would allow the user to easily get to the proper layer of software. It would also allow the user to easily get to the proper layer of software. It also would allow the computer to adapt to the terminal and the job.

Mr. Swarthe said that everybody in the industry would be talking the same language for at least a little while, and that the National Bureau of Standards would probably, though not necessarily, accept the recommendations of the X3L2 committee as the Federal standard.