Application of I. B. M. Port-O-Punch

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MODERN research workers make extensive use of machine methods for processing the statistical phases of their projects. In many cases, projects could not even be attempted without the aid of computing and other data processing facilities. The first step in doing the statistical phases by machine is to punch the data into IBM cards. These are then fed into the computer or other equipment for whatever processing is required. Most commonly, data sheets prepared by the people doing the actual research are given to professional key punch operators, who read the data and punch it into the appropriate sections of data cards. The cards and data sheets are then sent to another operator who verifies the correctness of the punching on a machine called a verifier. This method eliminates operator error and has proven very satisfactory in the vast majority of applications.

In certain types of work, however, the method has some difficulties. One of these areas is in forestry, where most of the data recording is done outdoors, under something less than ideal conditions. Data sheets are often difficult to read, both because the original handwriting is frequently less legible than usual and also because they are likely to be smudged or smeared after recording. The sheets are usually unhandy for the field men and often are difficult key punch source documents. Ideally, many people felt, the card ought to be prepared directly by the field man himself.

The first step in this direction was the familiar “Mark-sense” card, where the recorder uses a soft pencil to black-out spaces on the IBM card corresponding to the numbers he wants to record. The cards are then fed into a machine at the processing center, and holes corresponding to the blacked-out spaces are punched automatically. The machine used is a 514 or 519, equipped with Mark-sensing device. The card is then ready for final data processing. This method eliminated the unhandy and difficult-to-read data sheets, and has been widely used in forestry and elsewhere. Meter-readers for both gas and electric public utilities, for example, commonly record readings directly on the IBM card, using mark-sense.

About The Author

C. M. Daniel is an IBM Applied Science Representative, assigned to the Des Moines, Iowa, branch office. A native of Massachusetts, he attended Rensselaer Polytechnic Institute at Troy, New York, leaving there to enter the U. S. Coast Guard Academy, graduating in 1944. After leaving the service in 1947, he received an M.S. in mathematics from the State University of Iowa, and spent several years in actual work prior to joining IBM.
Inserting a card in the Port-O-Punch  

Recording on a Port-O-Punch card

Cards. The accompanying picture illustrates the field use of a mark-sense card.

Applications like forestry, however, involve especially severe conditions. The soft pencil marks are more easily smudged and cards more likely to be damaged here than in ordinary commercial uses. The next step in direct recording, the Port-A-Punch, has special promise in this area. Basically, each possible punched hole position on the data card is pre-scored (i.e., each possible punched hole is outlined by a die cut which does not quite extend the full thickness of the card).

The desired number, or letter, for a particular column of the card is then punched-out with a stylus, a pen-like tool with a retractable tip similar to a blunted awl point. In practice, the card is placed in a special holder which supports it everywhere except directly under punching positions. It is covered with a transparent plastic sliding cover with holes corresponding to all proper stylus positions. This sliding cover may be ruled to show what parts of the card are to contain what data, or otherwise be marked with punching or data-recording instructions. The user then inserts the stylus into the hole over any desired punching position and punches out the pre-scored section. The punched-out piece (called a "chip") falls out of the way into the hollow back of the case. The accompanying photograph illustrate the method of use better than words. An attached magazine containing up to fifty cards is provided. Typically, this is filled with new cards before starting out. When recording, a card is taken from the magazine and placed in the punching part of the holder. When punching is completed, the card is returned to the magazine and replaced by a new card. Back at the data processing center, the cards can be processed directly by the usual IBM equipment. In some of these machines a very minor equipment modification is made to prevent damaging un-punched sections of the cards.

Cards are thus protected against pitch, weather, mud, crumpling, and other familiar field hazards, both while being punched and while being carried about. Also, there are no soft pencil marks to be smudged. Incidentally, Port-A-Punch cards can have up to forty columns of field recorded data, compared with up to twenty-seven columns of field recorded data possible with mark-sensed cards. A standard IBM card key punched at a computing center can have up to eighty columns punched.

After investigating the Port-A-Punch system, Dr. G. W. Thomson decided to use it experimentally, starting in the fall of 1958. This interest was prompted by observing the increased use of continuous forest inventory (CFI) where permanent plots and permanently marked trees are remeasured at fixed intervals. Since punched card computation lends itself well to both C.F.I. and to research work in forestry where the effects of many variables must be analyzed, Thomson believes it desirable that foresters become familiar with this method of field recording of data.

The magazine attached to the underside of the Port-O-Punch