

AUTOMATIC TYPING OF LITERATURE SEARCHES*

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If bibliographic information needs to be retyped even once in preparing a report, an appreciable saving of time can be achieved through application of an automatic typewriter to the operation. In the system described here, a punched paper tape produced when reference cards are typed on an automatic typewriter is used for type-out of a final master copy of the bibliography. The sections of the punched tape corresponding to individual references can be rearranged conveniently to satisfy the desired final arrangement, and the searcher is not confined to a predetermined order in making the search.

A number of typewriters which punch and read tape are available commercially¹; we have used the Friden "Flexowriter" (Friden, Inc.). Using the "Flexowriter," pertinent references and their abstracts are typed on 4" x 6" cards from handwritten or dictated material while the search is in progress. During this operation, a punched paper tape is prepared simultaneously. Unpunched sections are left on the tape between the individual references to facilitate subsequent separation of the tape into individual segments. These unpunched sections serve as leaders upon which temporary identification numbers are written in pencil. Each of these numbers is assigned serially as the reference is typed, and the corresponding number is typed on the card while the punch is turned off so that this number will not appear on the final copy. The individual segments are separated by tearing the tape on the cutter bar of the tape punch as they are typed, or they may be cut apart after the typing is completed. The sections of tape are folded into 8-1/2" folds and filed serially by their identification numbers. A prefolded tape which is commercially available expedites this operation tremendously. A typical reference card and its corresponding tape section are shown in Fig. 1.

The foregoing operations, including proof-reading of the cards, are performed on a daily basis before completion of the search. When the search is completed, the typed reference cards are rearranged in the desired order for the final bibliography. If draft copies of the report are necessary for any reason, these cards may be mounted on white bond paper

and reproduced by "Xerox" (Haloid Xerox, Inc.), "Verifax" (Eastman Kodak Company) or some similar process. The corresponding punched tapes then are used to type the final master copy of the bibliography. An example of final copy with its corresponding reference cards is shown in Fig. 2. In this step, the typist, referring to the identification number on the card, selects the proper tape section and inserts it into the reader on the "Flexowriter." She then types in the appropriate permanent number for that reference and has the "Flexowriter" type out

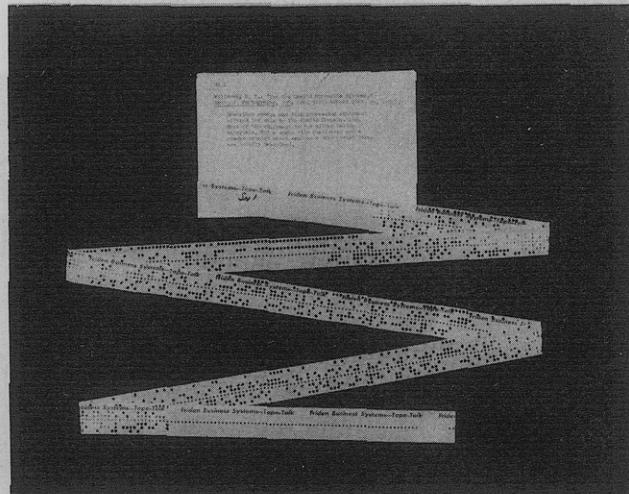


Fig. 1

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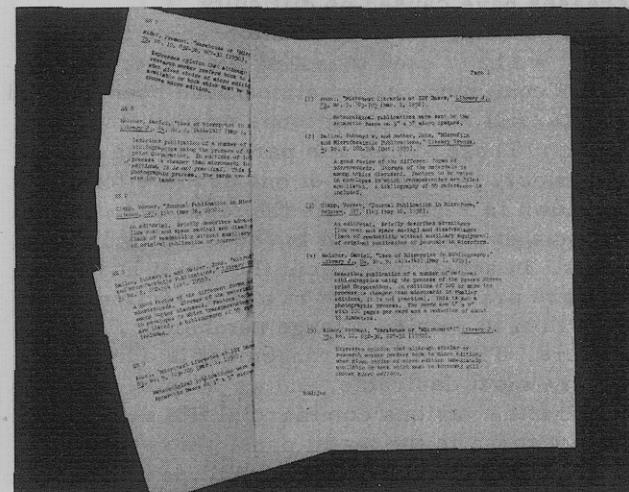


Fig. 2

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the information stored on that section of tape. She can stop the type-out at any time to make corrections noted on the reference card. The time interval in which the automatic typing is proceeding may be used by the typist for selecting the next tape to be read. This method of operation takes less over-all time than splicing the individual tapes into a continuous length in advance because even with a continuous length of tape, the typist must be present to insert reference numbers and make corrections. Figure 3 shows the typist selecting the next tape while a reference is being typed automatically.



Fig. 3

Folding the individual tape sections has proved to be a better technique than winding them into small rolls. In initial experiments with rolled tapes, the winding operation was found to be time consuming. It also resulted in a tape which had a tendency to kink, and one that did not always lie flat when entering the reader. This latter characteristic occasionally resulted in machine reading errors. The folded tape sections are very easy to handle, and the creases have caused no difficulty.

For filing the short bibliographic tape sections, we have used standard file folders in which continuous paper strips have been stapled at intervals to form ten loops or pockets per folder. These strips run parallel to the fold of the folder. A close-up of one of these folders is shown in Figure 4. As the tapes are cut and folded they are inserted in sequence into these loops. In actual operation, the typist has found it more practical to file five tape sections per loop than to employ a large number of file folders. This filing arrangement is admittedly not the most desirable, and we have been investigating various commercial file devices. One of these is the metal panel also shown in Fig. 4. A device of this type will permit fast filing and removal of the tapes. Several other commercial file panels examined appear to

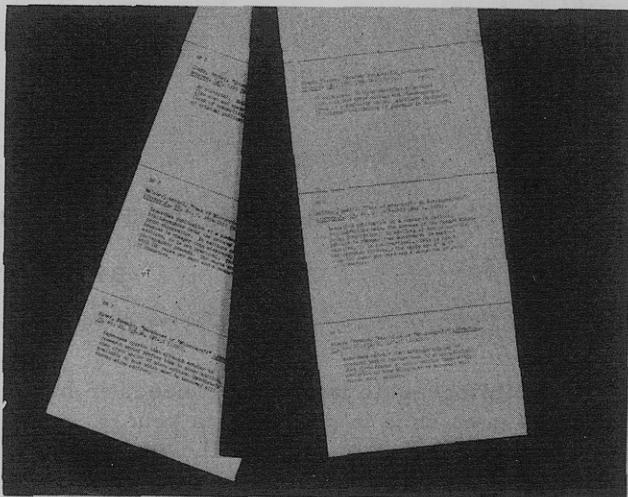


Fig. 4

have been designed for more elaborate filing systems and require more time for inserting and removing tapes from the pockets.

On the original typing, it is necessary to restrict the length of lines to a measurement which will fit into the desired margins of the final copy so that carriage returns and tab settings will be in the proper place in the final type-out. It is possible, however, to have double or triple spacing on the original copy and single spacing on the final copy. This is accomplished by varying the space setting on the automatic typewriter. The punch in the tape merely instructs the typewriter to make a carriage return; the spacing depends entirely upon the setting of the typewriter. In this case, a 4" x 6" card will accommodate the desired format, which allows for 1-1/4" side margins on an 8-1/2" x 11" page. For convenience we use 6" x 16" sheets perforated into four 4" x 6" sections. These sheets are obtained in pads with interleaved carbons which permit the preparation of a reasonable number of carbon copies. A sample sheet is shown in Fig. 5. Generally, one carbon copy is made. The original card is used for rearranging the bibliography, as

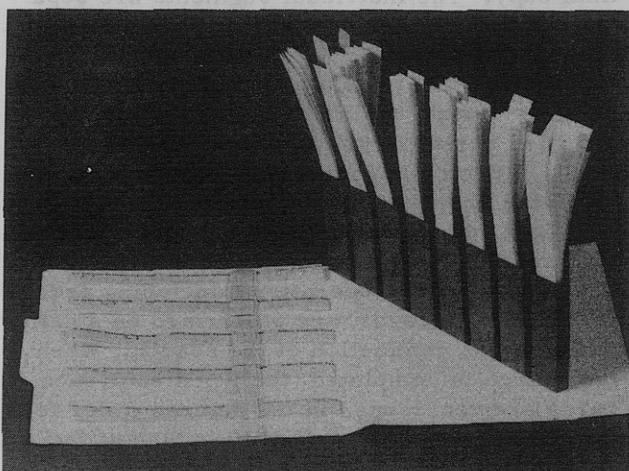


Fig. 5

already noted, and the carbon copy is used as a subject card in preparing a critical evaluation of the information found.

This procedure was developed through trial in the actual preparation of reports on a "learn as you earn basis." With each succeeding report, changes have been made in an effort to obtain additional improvements and, as indicated earlier, we contemplate further changes in the filing equipment. With the present procedure, using the "Flexowriter," we have been able to reduce the time required for copying the final annotated bibliography in our reports to 60% of the time required for manual typing. In the particular application described, the "Flexowriter" can maintain a sustained typing rate of 85-90 words per minute. Additional time savings result from elimination of final proofreading and the necessity of making corrections after proofreading. The time required for handling and rearranging the tapes has been taken into consideration in arriving at the 60% figure.

We first started working on a system using an automatic typewriter when we were offered part-time use of a "Flexowriter" which had been obtained for another operation at our location. It is quite likely that in many libraries or information centers, purchase of an automatic typewriter for use only in writing up searches is not justified. Other activities in which it might be used profitably are preparation of cumulative lists, where it would be necessary to type manually only the new additions, or typing of catalog cards where a number of duplicates are needed. Procedures for the latter operation have been published.^{2, 3} A plan for exchange of tapes between libraries also has been suggested.¹

ACKNOWLEDGMENTS.--The writer wishes to thank Mrs. Joseph McKelvey for putting into practice a workable typing routine, and Miss Johnnie Collard for enthusiastically continuing this operation with additional practical suggestions.

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