A PUNCHED CARD SYSTEM FOR AN ANALYTICAL LABORATORY

BY ASA N. STEVENS Eli Lilly and Company, Indianapolis, Ind.

The quality control laboratories of the pharmaceutical industry are responsible for the identity, potency, and purity of the lifesaving drugs your doctor uses to cure your ills. Under the statutes protecting your health, we must retain data to show that our products meet the requirements under which the Food and Drug Administration allows their use. Thus, the documents containing the data, particularly their storage and retrieval, are important.

About four years ago it was proposed that a study be made of the records produced in our analytical laboratories and that the use of punched cards as a means of storage and retrieval of information be investigated. This study, made by a team composed of personnel from the control and office systems functions of our company, revealed, among other things, that it required 23 working days each month to accumulate, compile, and prepare the monthly reports required by our management. More striking, however, was the number of man hours per day spent in checking and distributing samples, preparing report forms, and recording data on documents. Each day the equivalent of about nine technically trained people were bogged down with paper work.

After a thorough study of our flow charts and reports, we concluded that if we could establish a central area to receive and distribute the samples going into the Analytical Departments, retain all documents accompanying these samples in one location, and establish a central records area, we could relieve technically trained people of a lot of paper work and place our laboratory data on punched cards without altering the essential operations of the analytical departments.

Also, if the punched cards were designed properly, we would have better control of sample distribution, be able to consolidate and unify reports, and have an improved, integrated system which would be more efficient and economical to operate. Furthermore, punched cards should provide flexibility for retrieving, compiling, and printing data for cost analysis. statistical studies, and evaluating the efficiency of analysts, groups, and departments. They should also help management in forecasting man power requirements.

The success of any system using punched cards depends upon the meticulous design of the card itself. This is particularly true of a punched card which is to be used to report the analytical results of a pharmaceutical product. First of all, it is a document which may be used in court. Therefore, it must contain all the information necessary to identify the product and batch, verify the analytical results, tell us who did the assay and when, the method used, and whether or not the analysis is within our control limits.

Second, our cost accountants wish to know how much time (man hours) it takes the chemisto do the assay, what department wants the work done, what department does the work, what account to charge the work to, and if the product requires a pharmacological test, what kind and how many animals are used (rats, mice, monkeys, etc.). They also need to know, in the case of a purchased material, where we bought it and the supplier's lot number. Table I illustrates the fields we chose in putting this information in IBM cards. This facilitates machine handling We use one card for Finished Products, another for Purchased Materials. Note that similar fields are in the same position on the two cards.

In the IBM card shown (Fig. 1) A designates the fields, B designates that portion of the care

TABLE I

Finished Products		Purchased Materials	
Field	Column	Field	Column
Item Code	1-6	Item Code	1-6
Charge To	7-9	Charge To	7-9
Lot Number	10-15	Lot Number	10-15
Section	16-17	Section	16-17
Dept. Submitting		Dept. Submitting	
Sample	18-20	Sample	18-20
Type Sample	21-23	Type Sample	21-23
Dept. Doing Assay	24-26	Dept. Doing Assay	24-26
Blank	27-31	Vendor Code	27-31
Tub File Location	32-34	Tub File Location	32-34
Assay For	35-43	Assay For	35-43
Man Hours	44-47	Man Hours	44-4"
Method of Analysis	48-49	Method of Analysis	48-49
Date In	50-53	Date In	50- 58
Blank	54-61	Vendor Control No.	54- 61
Fatal Animals	62-66	Fatal Animals	62-6€
Date Out	67-71	Date Out	67-7
Analyst	72-74	Analyst	72-75
Assay Results	75-79	Assay Results	75-79
Disposition	80	Disposition	86

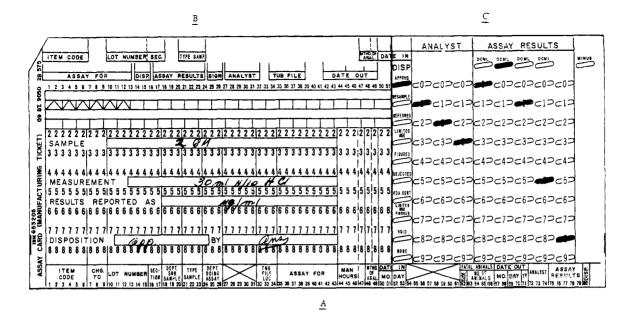


Fig. 1.-IBM card.

used to record the Analytical data and \underline{C} is the Mark-Sensing portion of the IBM card.

The system we now use is described here. Samples for analysis, with the proper identifying documents, are brought into a central receiving area. This area is responsible for seeing that the necessary information to be keypunched into a punched card is supplied to the keypunch operator and that the samples and punched cards are distributed to the laboratories doing the analysis.

On receipt of this information the keypunch operator pulls a punched card containing certain pre-punched information from a tub file. We pull one card for each analysis. The information is then keypunched into the card using an 026 printing card punch. The punched card is duplicated and the duplicate card placed in an inventory file. The original card and sample are sent to the laboratory. The documents accompanying the samples are retained in one area.

In the laboratory the sample and IBM card are given to the chemist who will run the analysis. The chemist records in the spaces provided (Figure 1-B) the sample taken for analysis, his measurements, the unit of measure in which he wishes to record his results, the disposition of the test, and initials the card. He then mark-senses the disposition, his analyst

number and results in the mark-sense portion of the IBM card (Figure 1-C). The completed card is returned to our records center for reproduction and interpreting.

Here the results of the chemist's analysis are punched into the card, matched with a card in our inventory file and the duplicate selected out. The assay results are then printed out, using a 402 accounting machine, and a copy of this printed report is delivered to the area holding the documents that accompanied the samples. The original cards go into our permanent files The duplicates are held for management reports.

- By using this system we have been able to.
- Practically eliminate the paper work done by analysts, allowing them more time for analysis.
- 2. Establish better control of assay sample processing.
- 3. Provide daily inventory and production reports.
- 4. Forecast manpower requirements.
- 5. Provide flexibility for retrieving, compiling, and printing data for cost analysis, statistical studies, and effectively evaluate the efficiency of analysts, groups, and departments.
- 6. Consolidate and unify reports.