My presentation today will be confined to systems in retailing that are either in operation or in the development stage. There is little point in describing retailing as seen through the eyes of a customer since a store is a familiar sight to each of you. Retailing as seen through the eyes of a computer is quite a different picture however. For you and me, who are interested in cybernetics, it is an equally exciting one.

I deliberately used the term “eyes of the computer” since optical character recognition is essential to implementing the concept for use of computers in retailing, just as magnetic character recognition is basic to banking.

I do not have the time to round out a full concept for use of a computer in retailing in the half-hour allotted to me, so with your indulgence I will refer only to the major systems.

There currently are very few “real” time applications in retailing and because of the economics involved there is primary interest in on-line systems supplemented with some real time. The term “right” time is now being used to identify this combination of systems.

The primary files in use are:

- Item merchandise
- Resource
- Employee
- Customer
- Financial data

These files are addressed by numeric codes containing a check digit. Since data often has to be referred to outside the computer in an alpha sequence, such as customer records, we are confronted with the need to establish a numeric system with gaps to realize both an alpha and a numeric sequence. With the input of numbers in a data recorder by thousands by salespeople in an environment that is not conducive to accuracy, check digits are required to maintain a satisfactory level of performance.

For years there has been recognition that a “point-of-sale” device for input of data relative to a sale of merchandise is essential to an advanced system. At Woodward & Lothrop we have installed more than 800 Data Recording Electric Accounting Machines (DREAM) throughout all of our 11 stores. This equipment performs all of the functions of the traditional cash register, but with the introduction of stylized font to print the journal tape, a non-add key for entry of descriptive data, and a few other changes, an on-line system has become available to retailers. The journal tape is read each night and the following data is available for each sales transaction:

- Salesperson’s number
- Employee number—for Calculation of discount
- Department
- Class
- Item number
- Amount
- Customer number
- Type of sale
There no longer is any limitation on salespeople or the merchandise they record in a register.

Department, class, and amount are entered in one pass. Other data, such as salesperson number, customer, item number, is indicated with a supporting code number and the data key.

The equipment is not limited to the entry of sales data since it acts as a communications device from the sales area to the central information center. Other data such as the following can be entered with appropriate codes for identification.

1. Time of day—to determine sales by periods of day.
2. Stock counts—to update perpetual inventory records.
3. Employee time of signing in and out—for payroll.

Variations of this equipment include the capturing of data on magnetic tape, punched tape, or punched cards in a central area and punched tape at the point-of-sale.

With the installation of these registers supported by computers, Woodward & Lothrop overcame the hardware limitations for applying management sciences to retailing. Effective supervision and discipline now remain the limiting factors. In order to implement these we make available a report daily identifying by registers all salesperson errors. The computer currently performs 36 audit checks and as additional data is introduced the audit routines will be increased.

I took the time to describe the “point-of-sale” device in some detail since it does constitute a major breakthrough for application of computers in retailing. I would now like to direct your thinking to the files that will be maintained.

### ITEM MERCHANDISE

No one system is adequate for the management of a department store inventory and we often characterize the item as being one of the following:

- **Staple**
- **Fashion**
- **Big Ticket**
- **Mixed**

Generally speaking, systems supporting different classes of items will include the following:

#### Staple

1. Mathematical models are developed from past history of the same or related items which can be used for forecasting sales to support an order.
2. Sales activity developed from entry in the “point-of-sale” device, periodic stock counts or print punch marking tickets.
3. Purchase orders prepared by computer on a regular weekly or biweekly basis for delivery direct to stores or warehouse. In the foreseeable future there should be machine-to-machine communication. Retailer-to-Resource.
4. A punched card activated marking machine is projected for the near future. The marking, as well as a turn around document to support receipt of the merchandise, is then a by product of preparing the purchase order.

#### Fashion

1. Criteria is developed by price line, class, and department from past history to identify if a style is following a normal pattern and will sell out on schedule, if it is “fast-selling” and should be considered for reorder, or if it is “slow-selling” and should be returned to resource or marked down.
2. File updated daily from sales recorded by item number in “DREAM” point-of-sale device, print punch ticket or manufacturer’s ticket. The item number will constitute the computer address, but all reports will include the full description of the item understandable to the buyer, vendor, style, etc.
3. A daily report of exceptions, fast and slow sellers, is prepared for buyer action.
4. A plan of model stocks by category of merchandise by store will be maintained by the computer to guide buyer in distribution of incoming merchandise.

#### Big Ticket

1. A reservation file is maintained by all items by location, which is interrogated from the selling floor. When the sale is completed, the necessary forms are prepared in the warehouse to pull stock and effect delivery.
2. The report is intended to keep buyer informed of stock status and sales activity to stimulate action on items that are not moving according to plan.

The item merchandise files will include a reference to the resource files, but the latter will be maintained separately for accounting purposes to effect payment of invoices, as well as for evaluation of overall profit performance.
Resource File

1. Ideally for the retailer, the item of merchandise should be marked by the resource in such a way that the record of its sale can be perpetuated mechanically.

Efforts to accomplish this are currently manifest in print punch tickets that have a uniform format for manufacturers of category of merchandise, as well as distinctive resource numbers. Interestingly, the more sophisticated systems of retailers conflict with this concept, since an item number is required to identify the sale, and this cannot be accomplished with a group of manufacturers.

2. In order to simplify payment procedures, retailers and manufacturers have cooperated with Dun & Bradstreet to develop a manual of distinctive numbers for resources. These are included on their invoices and used by retailers to address the file.

3. Where the order is on record in the computer, a turn-around document will explode the programs to adjust perpetual inventory records and effect payment of invoices.

EMPLOYEE

We are working to reduce the number of employees in the application of computers but they will always remain the principal element of success in retailing, since there is a personal contact at the point of sale.

One file will satisfy all the requirements of personnel, payroll and the supervisor for evaluation of performance.

Where the individual's performance affects the accuracy of the central information center, error records will be maintained which will be important in reviews.

The successful implementation of computer systems in a department store with decentralized input demands that the highest practical standards of accuracy be achieved.

CUSTOMER

With the initial application of computers to prepare customer bills, both retailers and customers were upset that the customer becomes a number on the records of the company. I well remember the letters we received at the time of our conversion. Some even punched holes in the tab card or tore it up to show their frustration.

Our plans for the immediate future are exciting because we are talking a personalization of the file beyond what we could ever achieve with clericals.

How does this sound?

1. At the time a customer opens an account she completes a questionnaire from which we build a profile of the family. If the questionnaire is not completed, then the computer will build a similar record from purchases.

2. The detail of the individual's purchases is identified by store, department, class, item number, price, and possibly size. The customer number is also input in DREAM.

3. The detail is stored for billing, but also summarized to indicate categories of merchandise and price lines purchased. The proper coding on the descriptive bill will enable the store to be selective in inserting direct mail advertisements that should have special appeal. Feedback of sales should maximize the effectiveness of promotions.

4. A profile of payments on account enables us to personalize collections and make decisions relative to authorization of purchases. We propose within two years to interrogate the computer from the selling floor by telephone and authorize purchases with a voice answer.

5. As complaints on service are received they can be accounted for and controlled to enhance service.

6. As we desire to follow-up on anniversaries, birthdays, big purchases, specific items, this can be accomplished.

FINANCIAL INPUT

Planning, control, and evaluation of performance are, of course, basic to the success of a business. We accept the fact that from the records of past performance, dynamic plans can be made; from the daily record of activity, effective controls can be maintained and management will be able to evaluate performance from reports prepared on an exception or other specific basis to inform the executive.

The timeliness and selectiveness of reporting has been immensely improved with use of the computer, but we look for exciting innovations in this field. As the effectiveness of management can be enhanced, this may well be the most significant contribution of the computer to retailing. We now accept the man-machine relationship.

Our immediate plans include variable budgeting. Expenses are now being reported compared to plan and last year. We propose to identify the extent to which each account is fixed and variable, and the cost re-
related to workload beyond the fixed point. When this is accomplished, we propose to have the computer develop budgets based on proposed volume and then to determine the percent of budget realization based on actual performance.

DEMISE OF INEFFICIENT RETAILER

The computer will not accomplish for all retailers the benefits noted. For many years I believed the computer might help the independent retailer to be more competitive. I now appreciate that many of the concepts referred to are not available to the small retailer because he does not have the finances or the staff to implement them. Service bureaus and arrangements to share computers with banks or other businesses will help, but they can never match the efforts of the big chains or the large independents. The computer may well then speed up the demise of the small retailer, except as the advantages of the computer are offset by superior personal management. Certainly the future of the complacent, inefficient store is questionable.

Retailing however will get a bigger share of the customer's spendable income.

PRIMARY IMPACT OF COMPUTER ON RETAILING

I hope you share my enthusiasm for the use of computers in retailing, even if my reference to specific applications has had to be brief. In the few minutes left to me I would like to summarize this impact.

Inventory Management

1. We will operate with lower stocks and achieve a faster turnover.
2. Balanced assortments will be maintained with fewer stockouts.
3. Markdowns will be reduced and sales increased as a result of the above.
4. Buyers will be relieved of clerical functions to direct their attention to creative activities.

Customer

1. As profiles are maintained for each family, we will be able to render a more personalized service which is vital when the same merchandise is offered by several retailers.
2. Promotions will be more personalized.
3. Retailing should realize a bigger share of spendable income.

Credit

1. City-wide numbering is now developing which will be a future basis for combined authorization, billing, and collection, with material savings in postage and duplicated effort.

Simulation

1. As decision rules are defined and systems developed, we will simulate performance to determine the level of customer service we desire to achieve related to:
   a. Inventory investment
   b. Achieving ideal schedules for salespeople
2. Through use of management games, executive training can be expedited and an earlier indication of executive ability determined.

Management, Planning, Control and Evaluation

1. Centralization of functions with improved efficiency at lower costs will be realized.
2. The effectiveness of each executive will be materially enhanced.
3. Share of the market and net profit will be improved.
4. With higher earnings on invested capital, retailing will be more attractive to the investing public.

THE CHALLENGE

The promise of EDP in retailing exceeds almost every other business and the problems of implementation are just as difficult. Ours is a business of people—salespeople, buyers, clericals, executives, warehousemen, delivery drivers—trained to buy and sell merchandise and services to other people—the customers. All of these people resist regimentation and covet the independence to adjust to current situations. Our success in the past has been due in large part to the flexibility and judgment of these people.

The application of the computer demands that certain procedures be executed with a high degree of accuracy. The term discipline is now being referred to more and more as necessary to achieve higher standards of performance. As the management of a store understands the potential for computers and gives leadership to the changes required, it becomes an exciting experience to participate in a team effort where the results are impressive. With other immediate problems demanding attention, management effort is often directed elsewhere and the progress is slow.

The large chain has the advantage here since a staff of experts can be directed to develop pilot operations...
in stores, which can then be extended to others. Enlightened management in a large independent store however can achieve ever more impressive results.

A premium is developing for the quality of leadership, knowledge and ability represented by you in attendance here today to accomplish the improved performance in retailing through use of computers that can be realized in no other way.