A Stock-Control and Invoicing System using a Gamma 3 Computer

By D. R. Palmer

Dorothy Perkins Ltd. are large-scale retailers of women’s wear, with a chain of 167 branches throughout Britain. They handle a considerable amount of merchandise and the quantity is continually increasing. The Directors of the Company have been well aware of the necessity for a comprehensive stock-control system in a trade where trends vary rapidly. Up-to-the-minute information on stock is also essential to prevent over- and under-buying. To this end, a decision was made towards the end of 1960 to install De La Rue Bull data-processing equipment.

Introduction

The computer system eventually evolved, after a series of discussions between members of the De La Rue Bull staff and representatives of the Dorothy Perkins management, was based on a mark-sensing technique exclusive to Compagnie des Machines Bull. It was designed to maintain a strict daily control of warehouse stocks, to streamline distribution and ordering routines, to pre-invoice goods to branches, and to ensure a fair allocation of available stocks to all branches. In addition, various tabulations would be prepared as aids to the merchandise control and accounting departments.

The installation, which was completed in June 1961, consists of: a Gamma 3 electronic calculator, a magnetic-drum backing store of 196,608 decimal digits, a magnetizing track, a ULP card reader/punch (with special magnetic reading head), a DI sorter (700 cards per minute), a 535 tabulator (150 cards per minute), a PRD reproducer (120 cards per minute), as well as punches and verifiers.

The Procedure

A cycle of events has been established, covering the time the order is received from the branch until the time the goods are placed in the van for despatch. It is planned to take 48 hours. The sequence of machine operations is illustrated by Fig. 1 and is as follows:

The basic tabulation produced is the Daily Stock List. This shows quantities of all (some 3,500) stock items, detailed down to colour/size level, held on the magnetic drum. Items falling below the minimum or exceeding the maximum stock level are indicated in a special manner. These data are then passed to the merchandise control department. There, from the information given on the list, and bearing in mind items not at present in stock but known to be coming into stock, the Availability List (Fig. 2) is prepared. On this statement all items out of stock or withheld for any reason will have “Nil” printed against them, whereas all available items will be marked by a blank space.

Next the Availability List is photocopied and distributed to all branches (at varying times, depending upon which day the branch is required to order).

On receipt of her copy the branch manageress lists only the actual stock of each line of goods held in the shop: by code/size/colour variation in the blank spaces provided against available items. No other information is needed.

The manageress then copies the information from the Availability List on to the Stock Cards (Fig. 2). Each branch is provided with an adequate supply of these cards and with special marking pencils containing a ferric-oxide substance. Each department—knitwear, hosiery, etc.—has its own card, which is pre-punched with Branch Number, Department Number, Card Code, and a code denoting the grade of the branch. There are six grades of shop, the grade depending generally on the branch turnover. The Availability List and card are designed to line up, to simplify the marking, as illustrated in Fig. 2.

When the cards for each department have been completed they are placed in a special container and sent to the Head Office at Bracknell.

On receipt at Head Office the cards are fed through a machine which magnetizes the marks on the cards, which are then ready for the first computer run, the purpose of which is to calculate a fair allocation of available warehouse stock to all branches. The cards are fed through the ULP card reader/punch which acts as input to the computer, and at the same time:

(i) carries out a check on every marking-column, rejecting all cards which have been marked inadequately; and
(ii) punches into each card the details marked on that card.

These cards will later be used for the invoicing run.

During this first run, the branch stocks of each item are accumulated in the computer by code/colour/size. Simultaneously, the corresponding registered stock for each item is also accumulated—the registered stock being merely the amount of stock each branch is required to hold for any given item, depending on the grade of the branch. Provision is made for grades to vary by department within a branch and, by the use of control holes in the card, special grades can be introduced, giving considerable flexibility of control.
1 Branch stocks accumulated, demand calculated and allocation made.

2 Allocations read out from drum and printed on invoices. Stock updated.

Fig. 1.—General flowchart

Fig. 2.—Availability list with a specimen stock data card input
Calculation of Demand for Restocking Branches

When the last cards have passed through the machine, the total branch stocks have been accumulated by item, and also the total registered stocks. The total demand is calculated by deducting one from the other. The computer then compares requirements with the actual stock available for the day in question.

A word of explanation is necessary at this point to define the “stock available” for any particular day. The principle is that branches ordering on, for example, Monday should not be allowed to receive a disproportionate allocation of stock, as this may mean that branches ordering later in the week are short. Basically, the amount of total stock available for any one day should be 20%. This is not so, however, as the daily factor has to be applied to a reducing balance. Also, work is not spread evenly over the five days and, furthermore, a small reserve must be held back to cover special deliveries and mathematical adjustments.

This means that a separate percentage is necessary for each day, and these are fed into the computer at the beginning of the run. The machine automatically updates the daily cycle number from 1–5 and back to 1 again, although this updating can be overridden by the receipt of a fresh delivery of stock. This means that it is essential for each item to have placed against it its relevant cycle number: it is thus possible for one item to be standing at day 2 and another at day 5.

When comparing total demand with available stock, the computer will therefore select the appropriate daily percentage for the item being considered (according to its cycle number) and apply it to the total available stock. If demand is less than the stock available, no further action is taken on that particular line: if demand exceeds stock then the allocation routine is begun.

The computer now automatically ensures that all branches of the same grade will have their stocks made up to a common level, by fixing a new temporary registered stock level by grade. This is a realistic figure based on the amount of stock available for distribution, and taking into account the orders for the day.

Preparation of Invoices and Despatch Advises

The new registered stock figures having been calculated where necessary, the second computer run can commence. The branch stock cards, which have been punched by the ULP reader/punch, are now passed through the tabulator (connected, in place of the reader/punch, to the computer), and the following operations are carried out.

(i) The computer reads the branch stocks from the card, looks up the appropriate registered stock figure on the drum and calculates the difference. This represents the value of the order by quantity. The necessary data are then read back to the tabulator and Invoices are printed with price extensions, the values having been calculated meanwhile.

(ii) The quantities invoiced are stored separately on the magnetic drum and are used later to prepare the Daily Despatch List.

(iii) The stock balances are adjusted.

 Provision is also made for the machine to allocate total requirements by price in proportion to the stocks available by price. In certain cases quantities are automatically rounded up or down to a predetermined delivery unit.

At the end of this run the invoices are passed to the warehouse, the branch stock cards from which they were prepared having previously been sorted into an order corresponding as closely as possible to the layout of the warehouse. On receipt of the invoices the warehouse staff pull stock against them, and then both stock and invoices are sent to the branch.

The feeding of new stock deliveries on to the drum is done by means of a card punched from a goods-inwards advice. A goods-inwards card, showing full details, is also used for new stock items. The program allows for automatic insertion of the new items in their correct order: existing items are then moved down automatically to make way for them.

Some important planned by-products of the system are as follows:

(i) Branch accounts.
(ii) Stock accounts.
(iii) Goods in Transit tabulations.

Conclusion

Of great assistance to the success of the scheme has been the insistence of Dorothy Perkins on adequate education for their staff in the workings of the new system. Among other things an “Easy to Understand” booklet has been issued explaining “SADIE” (Stock Control And Distribution Invoicing Equipment), and in addition a special film has been made to promote appreciation of the scheme. The consequence of this policy has been a high standard of card marking at the branches, a key factor in the success of this comprehensive computer system.

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