Summary

Sales activity tapes, as well as receiving tapes produced in the receiving departments of the several stores, are to be processed against an inventory tape, and a daily selling report produced. These tapes are to be sorted into order; in this particular case, they will be sorted according to store, department, class, manufacturer, style, color, size, etc. Since it has been indicated that the inventory consists of some 200,000 items, several tapes actually would be required for the master files, perhaps organized on the basis of stores and departments.

A significant point is that the information on these tapes is primarily an identification code; where 30 decimal digits are used to identify the item, perhaps only 2 digits of actual information has to be processed by the computer. Of these two digits of information, one may designate the type of transaction, such as a sale, return of goods, or other, while the other digit designates the quantity of items involved.

In general, the purpose of the computer is to identify the item from the transaction tape and to find the matching record or block of information from the inventory tape; after finding the proper master inventory record, the computer corrects the values of the inventory, and posts the transaction to the sales record. The arithmetic required is primarily simple addition and subtraction; there is no multiplication to be done in this part of the process, for example.

In the type of machine proposed, buffer registers will almost certainly be required to accept information from the tapes and feed information to the tapes. The buffer registers serve a synchronizing purpose, between the internal clock frequency of the computer and the different clock rate from the magnetic tape. Also, while one record is being read into one buffer, a second record may be already in the machine undergoing processing, while a third is being fed out of another buffer onto tape.

The types of commands that might be provided in this computer could include instructions to: read next item from sales activity tape, read next item from inventory tape, compare identifying portion of the code, if these are in agreement then the machine carries out the certain mathematical process, if these are not in agreement then the machine advances the inventory tape until such agreement is found.

Other commands would spell out which mathematical process are to be followed: correcting the number of items sold, the number of items on hand, and the number of items that have been received. A self-checking feature might involve comparing a net balance computed from the transaction tape with a net balance computed from the inventory tape. Another type of command would be editorial in nature, for arranging the output information in a form suitable for printing.
For the mathematical processes themselves, probably an extraction-add command would be used, plus the block make-up of the record being processed. Within the block of information from the inventory tape, perhaps three digits designate the number of items on hand. From these particular three digits, it is desired to subtract the quantity sold. In another part of the inventory block, this same quantity is added to perhaps three other digits representing sales for this month, or similar information. Since the same quantity information is to be added to one part of the block and subtracted from another, it is desirable to consider special purpose addition and subtraction commands. In contrast, general purpose computers normally add one complete number to another complete number. Other special purpose commands might post daily cash sales separately from daily credit sales. In general, the computer would be designed with a list of commands to carry out precisely the operations involved in the inventory process.

In another case, the receiving tape might store the quantity information on the number of items received at a different location within the transactions block from where it is stored in the sales transaction block. This quantity information may have to be added to the On Hand item and subtracted from the On Order item in the inventory block. In general, the sales activity tape will be processed in one way, the receivals a different way, and items that are returned still differently. But in all cases, it will be a matter of adding a two digit portion of one block to a three digit portion of another block, or a similar operation. Certainly these operations can be done with a general purpose computer, many of which are in existence in this country now. But to design an efficient machine, to compete in cost with the present system that has been described in an earlier paper, the machine will have to be built with the particular purpose in mind.

At the same time, the machine designer must guard against the possible change in the inventory system that would change the format of the block of information. The computer must not be too specialized, but must be capable of modification.

As a method of accomplishing the desired operations, and at the same time allowing for future modifications, the use of a special recirculating code register is suggested. Assuming that a binary coded decimal system is used, the six unused codes (not representing decimal digits) might be used to designate add, subtract, etc. These operation codes would now be inserted in the code register; when sensed, they would cause the following three digits in the transaction block to be added (or subtracted) to the following three digits in the inventory block. If the transaction quantity and inventory quantity are not "in phase," a three digit recirculation register may be added for delaying the transaction quantity a certain number of cycles. This might require that the division points between different types of information occur at multiples of three digit positions. It will be seen that this method is essentially a "no address" type of operation.