

**Systems**

**IBM 3650  
Retail Store System  
Introduction**

**IBM**

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Retail Store System  
Introduction**

**IBM**

*Ninth Edition (January 1978)*

This is a major revision of, and obsoletes, GA27-3075-7. This revision adds new selectable functions, and a variety of enhancements, to the existing 3650 Retail Store System functions, in support of RSS Release 3.2. A change, addition, or deletion in the text or an illustration is indicated by a vertical line to the left of the change.

Information in this manual is subject to changes; any such changes will be reported in subsequent revisions or Technical Newsletters. Before using this publication in connection with the operation of IBM systems or equipment, consult the latest *IBM System/370 Bibliography of Industry Systems and Application Programs*, GC20-0370, and associated Technical Newsletters, for the editions that are applicable and current.

Requests for copies of IBM publications should be made to your IBM representative or to the IBM branch office serving your locality.

This manual has been prepared by the IBM System Communications Division, Publication Center, Department E01, P.O. Box 12195, Research Triangle Park, North Carolina 27709. A readers' comment form is provided at the back of this publication. If the form has been removed, comments may be sent to the above address. Comments become the property of IBM.

## Preface

This manual is written for retail store personnel at management, administrative, systems, and programmer levels.

It introduces the devices, programming support, and communications facilities that make up the IBM 3650 Retail Store System. The more in-depth information that is needed to implement the various user-oriented 3650 system functions is also provided. The 3650 system collects and processes retail store information, to assist in effective retail management.

The RSS Release 3.2 information in this publication concerning Inbound Pacing for the retail store system is presented for planning purposes only (and is subject to change) pending notification of the function in the Retail 3.2 availability announcement.

Chapter 1 briefly introduces the IBM 3650 Retail Store System, tells how it meets current challenges in retailing, and describes the basic functions of retail store system components.

Chapters 2 through 7 discuss, in detail, the individual components of the IBM 3650 Retail Store System.

Chapter 8 describes the purpose and functions of the communications support devices used to connect all units of the system.

Chapter 9 describes the purpose and functions of the IBM System/370 host processor. The host processor uses IBM and user-provided programming support which, in turn, control the functions for the terminals, the store controller, and the host processor.

Chapter 10 gives a high-level description of the programming support provided by IBM for the IBM 3650 Retail Store System.

Chapter 11 describes the system configuration. Where applicable, standard features, options, and special features for the individual units are mentioned.

Chapter 12 discusses the need for security in a system such as the 3650, together with some of the methods to ensure this security. Security of individual units of the system is discussed in this chapter, rather than in the individual unit chapters.

Appendix A gives specifications for expendable items such as paper, ribbons, indicator lamps, and paper forms.

Appendix B contains specifications that must be used when insert station documents (such as sales checks, refund checks, etc.) are designed for the IBM 3653 Point of Sale Terminal.

Appendix C contains the IBM 3785 Model 1 Line Printer EBCDIC and Katakana character sets.

Appendix D gives specifications for cassette recorders and tapes that may be used with the IBM 3650 Retail Store System initial machine load (IML) backup procedures.

Appendix E gives information on maintenance procedures for the 3650 system and its individual units.

Appendix F contains considerations unique to IBM World Trade Customers.

References to VTAM and NCP in this manual include VTAM (Release 2.0) and ACF/VTAM; NCP (Release 5.0), and ACF/NCP/VS.

## 3650 Retail Store System Publications

This publication is intended to be used with other IBM publications. The subjects that are introduced in this publication are more fully explained in the companion publications listed below. At the end are listed related publications that a user of the 3650 Retail Store System may require.

### *IBM 3650 Retail Store System Physical Planning-Installation Manual*

Release 3.0	GA27-3074-3	(5/76)
Release 3.1	(TNL) GN27-3196	(8/76)

This publication provides technical information, specifications, recommendations, and suggestions to be used in planning an efficient physical installation of the 3650 Retail Store System.

### *IBM 3650 Retail Store System Physical Planning Template, GX27-2914-0 (6/74)*

This template assists in diagramming the physical layout of work areas where the 3650 Retail Store System is to be used.

### *IBM 3650 Retail Store System Sales Operation Guide*

Release 3.0 through 3.1	GA27-3089-4	(3/77)
Release 3.2	(TNL) GN27-3220	(12/77)

This publication provides operating and reference information for the IBM 3653 Point of Sale Terminal used with the IBM 3650 Retail Store System. It contains a general introduction to the 3653 Point of Sale Terminal and other components of the IBM 3650 Retail Store System, and it describes how to record a sales transaction at the point of sale terminal.

### *IBM 3650 Retail Store System Administrative Operations Guide*

Release 3.0	GA27-3117-0	(3/76)
Release 3.1	GA27-3134	(3/77)
Release 3.2	(TNL) GN27-3223	(12/77)

This publication describes the IBM 3650 Retail Store System, the basic operation of individual components (except the 3653 Point of Sale Terminal), and how to perform the basic nonsales functions of the system.

Your store's training staff can use this publication to develop a nonsales training guide tailored to your store's needs.

### *IBM 3650 Retail Store System Problem Determination Procedures and Operator Messages*

Release 3.0 and 3.1	GA27-3109-4	(3/77)
Release 3.2	(TNL) GN27-3224	(12/77)

This publication describes problem determination procedures to be used by retail store personnel and includes a complete list of all IBM-supplied operator messages that are printed or displayed.

*IBM 3650 Retail Store System Programmer's Guide*

Release 3.0	GC30-3035-1	(3/76)
Release 3.0, 3.1 and 3.2	GC30-3035-2	(12/77)

This publication is a guide for the programmer of the IBM 3650 Retail Store System (RSS). It describes the retail environment, describes RSS functions, file formats, and host communications.

*IBM 3650 Retail Store System Subsystem Definition Guide*

Release 3.0	GC30-3030-1	(5/76)
	(TNL) GN30-3065	(8/76)
Releases 3.1 and 3.2	GC30-3042-2	(12/77)

This publication provides the information necessary to code a complete retail subsystem definition using subsystem definition macros. This publication specializes in the coding of system definition macros and the keyword/parameters.

*IBM 3650 Subsystem Program Preparation Support Programmer's Guide*

Release 3.0	GC30-3024-3	(3/76)
Release 3.1	(TNL) GN30-3070	(3/77)
Release 3.2	(TNL) GN30-3091	(12/77)

This publication provides reference and coding information for writing programs for execution at the subsystem controller, for the retail store system.

*IBM 3650 Retail Store System Programming Installation Guide*

Release 3.0	GC30-3032-0	(6/76)
Release 3.1	GC30-3045-0	(3/77)
Release 3.2	GC30-3050-0	(12/77)

This publication describes how to install the programming components that operate with the 3650 Retail Store System, such as the operating system, VSAM, VTAM, SSS, and NCP.

## ***Related Publications***

*Introduction to the IBM 3704 and 3705 Communications Controller, GA27-3051*

*The Retail Store System:*

*Merchandise Processing System Concepts, GE20-0411*

*Big Ticket Merchandising Concepts, GE20-0412*

*Credit Management Concepts, GE20-0413*

*Inventory Management Concepts, GE20-0414*

*Manpower Management Concepts, GE20-0415*

*IBM Synchronous Data Link Control General Information, GA27-3093*

*IBM Teleprocessing Systems Summary, GA24-3090*

*DOS/VS VTAM System Programmer's Guide, GC27-6957*

*OS/VS1 VTAM System Programmer's Guide, GC27-6996*

*OS/VS2 System Programmer's Library: VTAM, CG28-0688*

*Subsystem Support Services User's Guide, GC30-3022*

*IBM 3872 Modem User's Guide, GA27-3058*

*IBM 3650 Retail Store System 3767 Model 2 Communication Terminal Setup  
Instructions, GA27-3133*

*IBM 3705 Communications Function for Network Control Program/VS,  
Generation and Utilities Reference Manual, SC30-3116 (referred to as  
the "ACF/NCP Generation manual")*

*ACF/VTAM System Programmer's Guide, SC38-0266*

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## Summary of Changes

### GA27-3075-4

The following is a list of functions and features which have been added to the IBM 3650 Retail Store System.

#### 7480 Store Controller

This store controller is available in two models, providing increased disk storage capacity of up to 27.9 megabytes. See Chapter 2 for additional information.

#### Selectable Functions and Features on the 3653 Point of Sale Terminal and the 3651 or 7480 Store Controller

The following is a list of functions and features that have been added to the 3653 Point of Sale Terminal and the 3651 or 7480 Store Controller. These functions are discussed in detail in Chapter 3.

- Using the 3653 as an Input/Output Device
- Fractional Sales
- Class Files
- Sequential Index Facility

#### IBM World Trade Considerations (Chapter 12)

This chapter has been rewritten and expanded. Much of the information unique to World Trade that was previously spread throughout the manual has now been placed in Chapter 12. In addition, new information has been added to this chapter.

### GA27-3075-5

This edition gives a new description of the IBM 3659 Remote Communications Unit (formerly available without a model number but now designated as Model1) and introduces the IBM 3659 Model 2 Remote Communications Unit. The 3659-1 allows connection of up to three remote locations to one remote loop, in a point-to-point configuration. The 3659-2 allows the connections of up to 12 remote locations to one store loop, in a multipoint configuration.

This edition also gives additional information on the functions and features of the IBM 3653 Point of Sales Terminal and the store controller.

## **GA27-3075-6**

The following is a summary of the information that has been added or changed in this edition. It includes additional features and additional machines that are available (by RPQs) for the IBM 3650 Retail Store System.

### ***OEM OCR Wand Attachment (RPQ 858816)***

This RPQ is available for IBM 3653 Point of Sale Terminals, to allow attachment of an OEM optical character recognition (OCR) device and wand. See Chapter 3 for additional information.

### ***IBM 3767 Model 2 Communication Terminal***

This compact, desk-top keyboard and printer transmits information to, and receives information from, the store controller. It can be connected to local and remote store loops (by installing RPQ 858807 in each 3767 attached). See Chapter 4 for additional information.

### ***IBM 7481 Data Storage Unit (RPQ 858813)***

This unit uses a magnetic tape cartridge and tape drive to record transaction data from the point of sale terminals, when the store controller is not available. It also uses a magnetic tape cartridge to provide 3653 initial machine load (IML) data on a store loop, if the store controller is not available. The data storage units can be used only in IBM 3650 Retail Store Systems with 3653s at the engineering change (EC) level that is current when the 7481s are shipped. See Chapter 7 for additional information.

## **GA27-3075-7**

The following is a summary of the information that has been added or changed in this edition.

### **Selectable Functions**

The new selectable functions introduced for Release 3.1 are included in this revision.

### **Checkout Environment**

The selectable functions that may be used to support a checkout environment are included, as a group, in this revision.

### **OEM EAN/UPC**

Wand Attachment (RPQ 858921) (World Trade European, Middle Eastern, African countries only). This RPQ is available for IBM 3653 Point of Sale Terminals, to allow attachment of a wand that will capture data from the EAN/UPC Bar Codes.

## **GA27-3075-8**

The following information has been added or changed in this edition:

- New selectable functions introduced in Release 3.2.
- OEM UPC Wand Attachment feature (RPQ 858983)
- Limitation on the number of nonsales sessions
- Ticket purchase orders requeued after Stop/Cancel
- Recovery of ticket queues after machine check/program check
- 7481 enhancements
- Inbound pacing
- Storage Expansion feature (for certain World Trade countries only)

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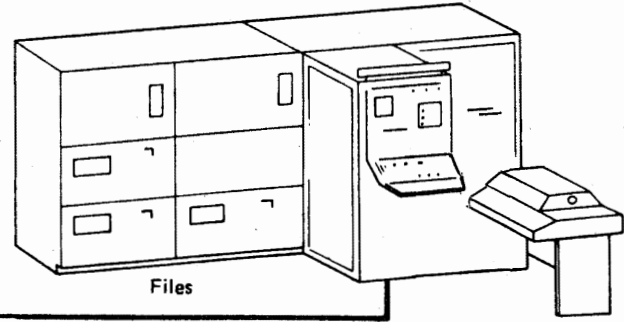


**CENTRAL PROCESSING SITE**

IBM System/370 Host Processor

IBM 3651 Model 50 or IBM 7480 Store Controller

IBM 3704 or 3705 Communications Controller



Files

Store Loops

IBM 3872 or 3874 Modems

**COMMUNICATIONS FACILITIES**

To Other Retail Stores

**RETAIL STORE SITE**

IBM 3651 Model 50 or IBM 7480 Store Controller

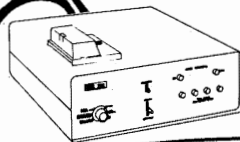
IBM 3872 or 3874 Modem



IBM 3784 Line Printer

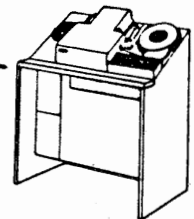
Store Loop #3  
Store Loop #2

A maximum of 64 terminals can be attached to each of these store loops. Either (or both) of these store loops can be specified as local store loops located at the same facility as the store controller, or for remote store loops at retail stores, warehouses, etc. located remotely from the controller. Each 7481 occupies one store loop address.



IBM 7481 Data Storage Unit

Store Loop #1 (local only) with a maximum of 63 terminals. The 7481 occupies one terminal address.

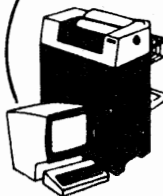


IBM 3657 Ticket Unit

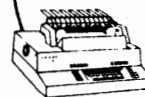


IBM 3653 Point of Sale Terminals

IBM 3275 Model 3 Display Stations



IBM 3284 Model 3 Printer



IBM 3767 Model 2 Communication Terminal

Figure 1-1. IBM 3650 Retail Store System with Host Processor

## Chapter 1. IBM 3650 Retail Store System

The IBM 3650 Retail Store System offers the retailer a store-level system designed specifically to meet the challenges faced by retail management today. The 3650 retail store system is a combination of devices, programming support, and communications facilities which retailers can use to build a complete retail management system.

Information for data processing, in many retail establishments, is currently gathered by independent data collection methods. Several independent systems, procedures, and devices are now required to operate and manage a store. These devices and procedures are often overlapping, incompatible, and expensive. They are designed for, and are operated by, various departments of the store to accomplish their independent objectives. The retailer presently must cope with these independent sources to solve the problems of:

- Customer service
- Sale of merchandise
- Credit authorization
- Purchase order entry
- Inventory management
- Receiving and distributing merchandise
- Management and administrative functions
- Big ticket inquiry and reservations
- Labor scheduling and manpower utilization.

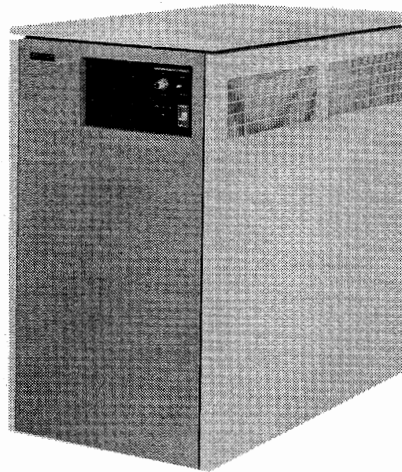
The IBM 3650 Retail Store System (Figure 1-1) is a unified system of data collection and processing that is capable of satisfying the needs of all these areas. Requirements for the selling floor, credit office, receiving room, and store management vary significantly. Because of this, IBM offers an integrated family of devices and programming support to work together to address these multiple needs. These devices include:

- The IBM 3651 Model A50 or B50 Store Controller or IBM 7480 Model 1 or 2 Store Controller: The controlling link between the point of sale operation and the receiving marking, and other merchandising operations, store management operations, and the IBM System/370 host processor. The store controller communicates with the various terminals on an interactive basis and processes inquiries to various files at the store controller and to the host processor. The store controller collects data from the various parts of the system, stores it, or forwards it to its ultimate destination in the system.
- The IBM 3653 Point of Sale Terminal: An advanced interactive point of sale device consisting of a keyboard, a three-station printer, a transaction display, a cash drawer, and an operator guidance panel. An optional magnetic wand reader (special feature) or an OEM OCR Wand Attachment (RPQ 858816) is available with the terminal.
- The IBM 3767 Model 2 Communication Terminal: A compact, desk-top keyboard and bidirectional printer capable of transmitting and receiving information on a local or a remote store loop. This terminal can be used for inquiry, data entry, and batch print applications.
- The IBM 3275 Model 3 Display Station: An interactive display terminal capable of displaying 24 rows of 80 characters each, with a data entry keyboard and an optional printer attachment for the IBM 3284 Model 3 Printer. The 3275 Display Station increases the store's data entry and inquiry capabilities.
- The IBM 3657 Ticket Unit: A high-speed device that makes and reads magnetically encoded and printed merchandise tickets, in varying sizes and formats.

- **The IBM 3659 Model 1 and Model 2 Remote Communications Units:**  
A communications device that physically connects devices, that communicate with each other and control the data flow between these devices.
- **The IBM 7481 Data Storage Unit:**  
A unit used for recording, on tape, transaction data from the point of sale terminals and for providing initialization data for point of sale terminals on a store loop, when the store controller is unavailable or becomes unable to perform such functions.
- **The IBM 3784 Model 1 Line Printer:**  
A high-speed optional printer that can be used to print store reports and administrative messages or reports from the host processor.

By combining these devices and the option for those selected by the user, the needs of individual store locations can be met. Through communication with an IBM System/370, the power of that system can be brought to the store location—to the sales floor as well as the back room.

## IBM 3651 Models A50 or B50 Store Controller and IBM 7480 Model 1 or 2 Store Controller



The IBM 3651 Model A 50 or B50 Store Controller or the IBM 7480 Model 1 or 2 Store Controller is the center of operation for the IBM 3650 Retail Store System. It is the data collector, the recorder for updating departmental and flash item totals, the communications controller for all of the attached terminals, and the message switcher and router for sending inquiries to, and receiving responses from, the IBM System/370 host processor. In addition to these basic functions of the store controller, facilities are provided for the user to write application programs at the central computer location, for execution in the store controller, thus achieving flexibility for store functions.

There is interactive communication between the store controller and its attached terminals. A maximum of 63 terminals can be attached to the store controller in a standard store loop. Two additional store loops, with a capacity of 64 terminals each, can be attached to increase this maximum to 191 terminals. These devices can be located in the same facility as the store controller or, by using the IBM 3872 Modem and the IBM 3659 Remote Communications Unit, remote store loop capability can be provided to retail establishments (stores, warehouses, etc.) located at a distance from the store controller. Refer to Chapter 11 for more details on configurations.

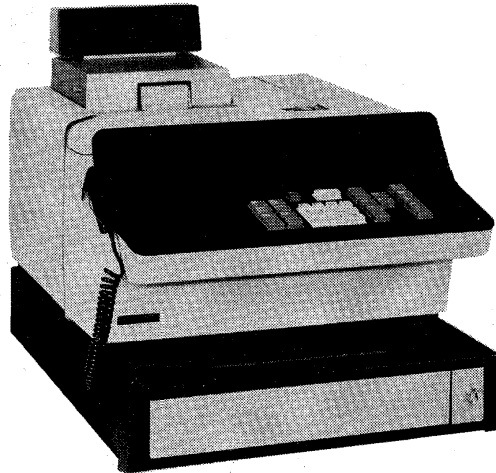
The store controller is equipped with one or more integral disk units, onto which data from all terminals connected to the store controller is collected and stored for future processing by user-written applications programs. The disk storage capacity for the store controllers are:

Store Controller	Storage Capacity
3651-A50	5 Megabytes
3651-B50	9.3 Megabytes
7480-1	18.6 Megabytes
7480-2	27.9 Megabytes

Batch and direct interactive communications between the store controller and the host processor is supported over a switched network or a duplex or half-duplex, leased, private-line communications facility.

Chapter 2 contains a more detailed description of the IBM 3651 Model A50 and Model B50 Store Controller and the IBM 7480 Model 1 or 2 Store Controller.

## IBM 3653 Point of Sale Terminal



The IBM 3653 Point of Sale Terminal performs cash register functions such as automatically accumulating totals, calculating change due, printing cash receipts and sales checks, printing a journal of all sales transactions, and maintaining audit controls. In addition, the point of sale terminal provides calculating capabilities, including multiplication, division, automatic tax calculation, discount calculation, and group pricing.

As an interactive terminal, the point of sale terminal provides online credit authorization. The IBM 3650 Retail Store System can implement restrictive and negative credit file checks at the store controller, with communications support to provide a full, positive-credit check at the IBM System/370 host processor.

This interactive facility allows functions such as automatic price lookup (where the store controller supplies the point of sale terminal with the price of an item, upon receiving the stock number) and applications such as big ticket inquiry, to be tailored by the user to the requirements of his store.

Customer service and sales data accuracy can both be improved by using the optional wand reader feature to read sales data from merchandise tickets. This eliminates most of the keying currently required of the salesperson. Operator guidance for the sales clerk is provided by a back-lighted operator panel that shows what entry should be made next.

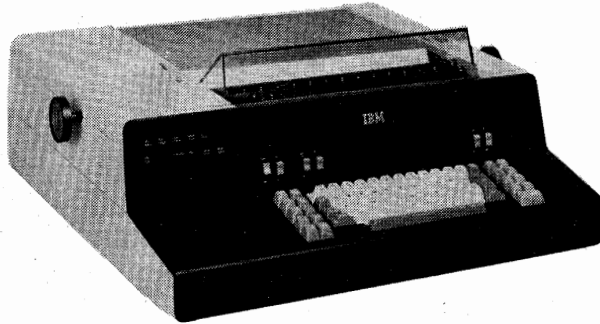
The 3653 can be used, in the nonsales mode and with user programming, as an input/output device. Input may be entered by keyboard, wand, form-sensing contact at the insertion station, or by sensing the open and closed condition of the cash drawer.

The point of sale terminal can operate in nonsales mode as a data entry/inquiry station or to train new personnel, without interfering with the operation of the store.

User-selected options for the point of sale terminal allow tailoring it to the individual store's requirements in areas such as tax and discount structures, that vary by store. The sequence of data entry, as well as the types of transactions allowed (COD, layaway, different charge plans, etc.) can be specified, resulting in an operation customized, not only by store, but also by department and individual terminal.

Chapter 3 contains a more detailed description of the IBM 3653 Point of Sale Terminal.

## IBM 3767 Model 2 Communication Terminal



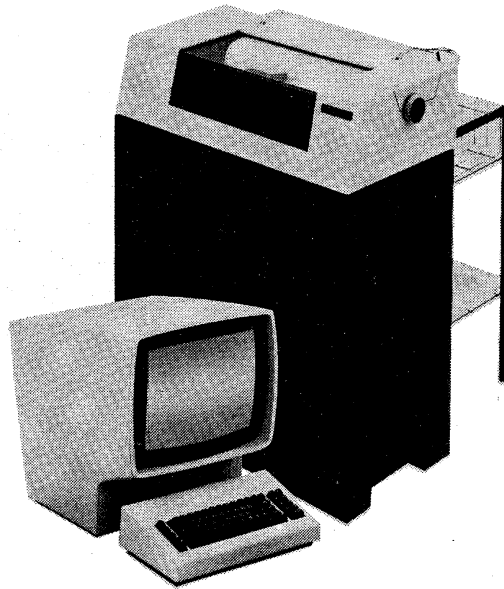
The IBM 3767 Model 2 Communication Terminal is a keyboard/printer terminal, which can be attached to a retail store loop by the Retail Store Loop Attachment RPQ 858807. While operating online with the 3650 Retail Store System, the 3767 transmits data to and receives data from the store controller. This terminal may also be used offline as a buffered typewriter.

The 3767 can be used for inquiry, data entry, and batch print applications. Reports and messages originating either at the host processor or the store controller may be printed at the request of the operator or the user program, if they reside at the controller.

Optional special features to provide additional forms control are Vertical Forms Control (VFC) and Variable Width Forms Tractor (VWFT).

Chapter 4 contains a more detailed description of the IBM 3767 Model 2 Communication Terminal.

## IBM 3275 Model 3 Display Station



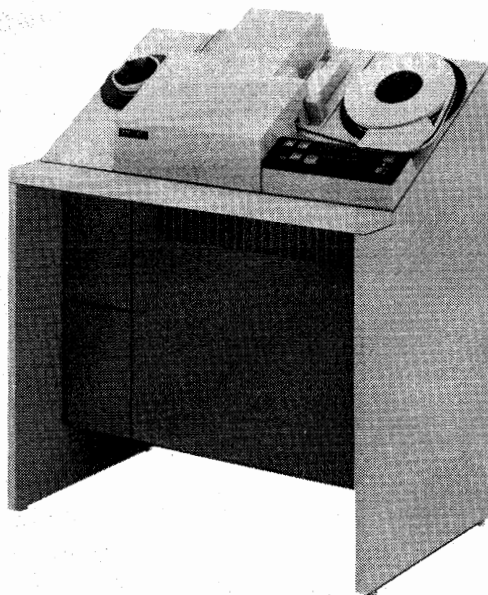
The IBM 3275 Model 3 Display Station and the optional IBM 3284 Model 3 Printer are an integral part of the IBM 3650 Retail Store System. They facilitate both the ticketing and the merchandising functions of a retail store operation.

The video display and keyboard entry capabilities of the IBM 3275 Model 3 Display Station make possible complex data entry and inquiry. This unit can be used to produce purchase orders, to control and check merchandise received, to control ticket production and price changes, to inquire into the user's files in the store controller or the IBM System/370 host processor, and for many other inventory and management control functions necessary in the efficient operation of a retail store.

The display station with the IBM 3284 Model 3 Printer attached can print reports produced by user-written application programs or the host, such as flash sales reports and similar in-store reports, store administration reports, sales audit reports, and receiving documents.

Chapter 5 contains a more detailed description of the IBM 3275 Model 3 Display Station and the IBM 3284 Model 3 Printer.

## IBM 3657 Ticket Unit



The IBM 3657 Ticket Unit operates online to the store controller, receiving ticket-preparation or ticket-reading requests from user-written programs within the store controller or at the IBM System/370 host processor. In addition to program-requested ticketing, the IBM 3275 Model 3 Display Station also provides ticketing control. Commands entered from the display station activate lights on the ticket unit control panel, thus guiding the ticket unit operator through the ticketing request. Operator intervention, therefore, is limited, in normal situations, to making the specified ticket setup and loading the ticket stock. Maximum productivity in the preparation of tickets results from this operator-prompting arrangement.

The ticket unit makes batches of printed or printed and magnetically encoded, 1-inch, self-adhering labels and 1-, 2-, or 3-inch tags. A batch of up to 4095 tickets, (all containing the same information) can be produced by a single message to the ticket unit. With each batch of tickets, an extra ticket is provided to identify the batch and give instructions to the marker on how and where to mark the merchandise.

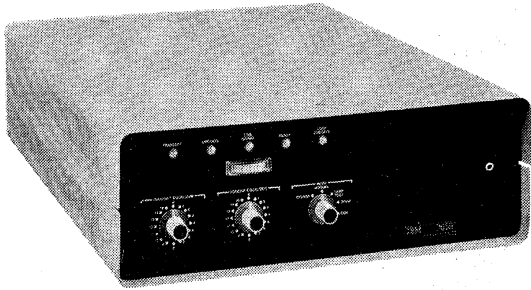
Two lines of alphanumeric information (including special characters such as dollar sign and half-size numerics) can be printed on each ticket, in addition to what is magnetically encoded. This provides more accurate ticketing and can improve customer sales and satisfaction by giving a better description of the merchandise. Authorization code tickets, employee identification tickets, and credit card tickets may also be produced by the IBM 3657 Ticket Unit to assist in retail store operations. Information on the magnetically encoded stripe on each ticket can be tailored to the individual retailer's needs and can be read by the optional magnetic wand reader at the IBM 3653 Point of Sale Terminal or, in the case of 2-inch tickets, by the ticket unit.

Information read by the ticket unit is transmitted to the store controller for processing by user-written application programs. This feature is important in such applications as stock counting and physical inventory, expediting price changes, or reading tickets collected in departments that are awaiting installation of the point of sale terminal.

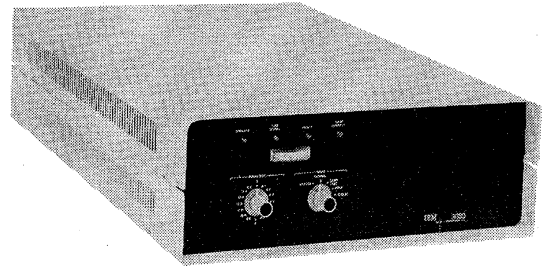
Chapter 6 contains a more detailed description of the IBM 3657 Ticket Unit.



## IBM 3659 Model 1 and Model 2 Remote Communications Units



IBM 3659 Model 2 Remote Communications Unit



IBM 3659 Model 1 Remote Communications Unit

The IBM 3659 Model 1 and Model 2 Remote Communications Units are used to extend the IBM 3650 Retail Store System to locations remote from the controlling IBM 3650 or 7480 Store Controller.

In addition to the standard local store loop, one or two remote store loops can be controlled by the same store controller. A 3659 is required at each remote location that is connected to a remote store loop.

A private-line communications channel is required between the store controller and the remote locations. A modem, such as an IBM 3872 Modem, is required at the store controller to connect each remote store loop feature to the communications facility. The 3659s are available in two models, to allow connection of the remote locations to the communications facilities either in a point-to-point configuration or a multipoint configuration.

Each remote store loop feature provides addressing and control capability for up to 64 terminals. These terminals can be divided among as many as three remote locations with 3659-1s connected in a point-to-point configuration, or 12 locations with 3659-2s connected in a multipoint configuration. The desired configuration must be specified when an IBM 3872 Modem is ordered for a remote store loop feature.

All data sent to remote locations originates at the store controller, which transmits the data to the remote store loop by way of the 3872, communications facilities, and the 3659 Remote Communications Units. Data received at each remote location goes through the 3659, around the store loop, and returns to the 3659. In a point-to-point configuration, data from each location is transmitted to the next store location, or in the case of the last station, back to the store controller. In a multipoint configuration, the 3659-2 at each remote location is selected one at a time, and it communicates directly with the store controller via the modem and communications facility.

A combination of 3659-1s and 3659-2s cannot be used on the same remote store loop. When a store controller has two remote store loops, however, one of the loops can be connected to the communications facility in a point-to-point configuration, and the other loop can be connected in a multipoint configuration. In this case, one of the 3872s must be a multipoint master station, and the other 3872 must have the Point-to-Point feature installed. A 3872 with either of these capabilities can be field-converted to have the other capability.

## IBM 7481 Data Storage Unit (Release 3.1 or Later)



The IBM 7481 Data Storage Unit can be attached to local and remote store loops. This storage device is used to record transaction data, initialization data, and file data on tape. A tape cartridge (IBM IRD part number 1608498) is required and is available from IBM in packages of five cartridges. One tape cartridge is shipped with each 7481.

The 7481 has its own power supply and a retail store loop attachment. This store loop attachment allows the 7481 to communicate (at 2400 bits-per-second) with the point of sale terminals, to record transaction data when the store loop is operating in backup mode; and with the store controller (when available), to transfer the transaction data accumulated from the point of sale terminals.

The primary function of the 7481 is to record transaction data from, or to provide initialization data to, the point of sale terminals if the store controller is not available or if it becomes unable to perform such functions. When communication is interrupted between the store controller and its store loop(s), the 7481 assumes loop control and it records the 3653 transaction data. When communication with the store controller is restored, the recorded transaction data can be transmitted to the store controller by a store controller command. This eliminates to some degree the necessity of having to manually enter the transactions that took place while the terminals were under control of the 7481 instead of the store controller.

This data storage unit can operate at a loop transmission speed of 2400 bps or 9600 bps. It can be used as a data storage unit on a 9600 bps only on a local store loop that has the special feature installed in the store controller and to transmit to or receive data from the controller.

The 7481 can perform certain online functions when it is communicating with a user program that is executing in the store controller. Functions that can be performed by the user programs are: (1) retrieval of logged data, (2) erasing and relabeling log tapes, (3) offloading and later restoring store controller files, (4) erasing obsolete tapes, and (5) performing other miscellaneous functions that require a secondary storage device, such as a magnetic tape cartridge.

The Power switch and the signal-cable connections are located on the rear panel. Control switches and lamp-type indicators are located on the front panel, for both operator and service personnel use.

Chapter 7 contains a more detailed description of the IBM 7481 Data Storage Unit.

## **IBM System/370 Host Processor**

An IBM System/370 host processor is necessary for installing and operating the IBM 3650 Retail Store System. The user defines the operational environment of each store controller at the host processor. This information, including the number and type of terminals to be attached to the controller as well as user-selected options for each terminal or type of terminal, is then transmitted to the store controller, so that each device in the system will perform the functions specified by the user. This process is further defined in Chapter 8.

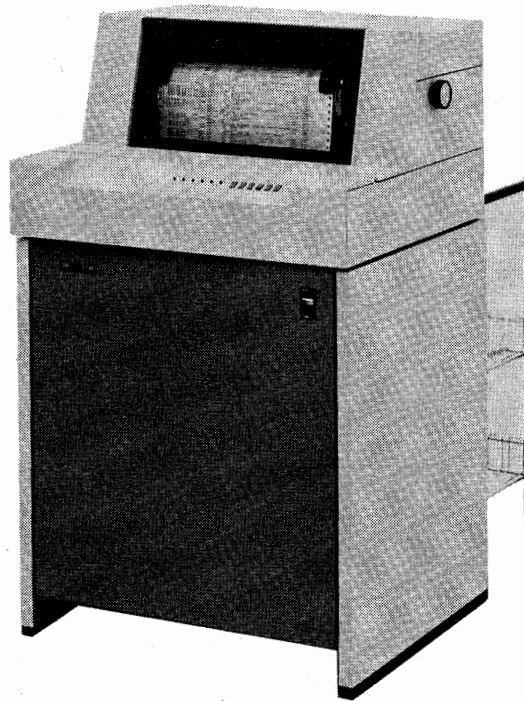
With IBM-provided support, the user can write application programs for execution at the store controller. These programs are translated at the host processor and transmitted to the store controller for execution. This support is further defined in Chapter 8.

In addition to user-written applications that are executed in the store controller, many other user-written application programs can be executed at the host processor, using data collected in the store controller and transmitted to the host processor. These programs could involve sales analysis, inventory control, manpower management, big ticket inquiry and reservation, accounts receivable, online credit verification, and similar applications requiring the data base and data communications capabilities of the host processor.

In this manner, a store-level system can be integrated into the central data processing system, allowing the retailer to build a complete retail management system.

Chapter 9 contains a more detailed description of the IBM System/370 host processor.

## IBM 3784 Model 1 Line Printer



The IBM 3784 Model 1 Line Printer can be used to print, at high speed, store reports and administrative messages or reports from the host processor. The optional 3784 Line Printer is attached directly to, and is controlled by, the store controller

Type styles and the forms that are available for the 3784 Line Printer are compatible with high-speed printers used at the host processor. Depending on the number of characters in the character set used, four printing speeds are available, ranging from 40 to 155 lines per minute.

The 3784 Line Printer prints messages and reports under control of the batch print function of the IBM 3650 Retail Store System. Host processor reports and store reports are stored on the integral disk unit in the store controller, then printed at the operator's request or at the request of a user program.

Chapter 2 contains a more detailed description of the IBM 3784 Model 1 Line Printer.

## Summary

The IBM 3650 Retail Store System is a unified system of data collection and recording that makes possible, a complete retail management system. With this interactive facility, data collected at one part of a store operation is available to other functions within the retail operation, forming the basis for improved overall management of not only one store, but multiple retail stores. Functions such as terminal control, transaction logging, and credit checking are performed by the store controller.

The store controller communicates with the host processor by batch and direct interactive communications over a switched network or a duplex or half-duplex, leased, private-line communications facility.

Flexibility of system design is provided in two ways. The user can generate the system by selecting the IBM-provided functions to be used in the store controller and point of sale terminals. In addition, the user can write application programs for execution in the store controller.

The IBM 3767 Model 2 Communication terminal is used for entering data into, and making management inquiries from, the store controller files and/or the host processor files. It gives the user access to data collected from both store and warehouse transactions. This data may be used in merchandise processing, merchandise management, and credit management, and credit management applications. The IBM 3767 may also serve as a report printer.

IBM 3275 Model 3 Display Stations permit data entry and management inquiry to the files at the store controller as well as inquiry to the System/370 files. This gives the user access to data collected from both store and warehouse transactions, for use in the merchandise processing, merchandise management and credit management applications.

Machine- and human-readable merchandise tickets produced by the IBM 3657 Ticket Unit and read by the wand reader (an optional attachment to the point of sale terminal) or read, in batch mode, by the ticket unit, give the retailer additional ticketing accuracy, reduced production costs, and increased efficiency at the point of sale. Report printing may be accomplished on an attached IBM 3284.

One of the major advantages of intercommunication between the host processor and all of the stores is the host's ability to accept, and reply to, inquiries from each store. This means that information such as customer billing, credit, purchase orders, bit ticket items, and personnel data is available at each store.

The IBM 3650 Retail Store System is an integral part of the basic retailing cycle illustrated in Figure 1-2: purchasing or receiving, ticket processing, sales processing, store management, and company-wide management.

### ***Purchasing or Receiving***

The user can produce purchase orders and receiving documents for processing by the host processor or by the store controller, using the IBM 3275 Model 3 Display Station and IBM 3284 Model 3 Printer, the IBM 3784 Model 1 Line Printer, or the IBM 3767 Model 2 Communication Terminal.

### ***Ticket Processing***

Merchandise tickets, in varying formats and sizes, can be prepared by the IBM 3657 Ticket Unit. Each batch of tickets can be accompanied by a batch identification ticket that gives instructions to the markers on how and where to mark the merchandise. Ticket processing also includes price change tickets, non-merchandise tickets, salesperson identification, authorization, and account tickets.

### ***Sales Processing***

The interactive capability of the IBM 3653 Point of Sale Terminal increases its function beyond that of an electronic cash register to include credit authorization and other interactive communication capabilities. User-selected options permit a sales operation to be customized not only by store, but also by department and individual terminal.

### ***Store Management***

Sales data collected by the IBM 3651 or 7480 Store Controller is the basic input for sales floor manpower management and inventory control. Once the data has been collected by the store controller, a management report can be printed by the IBM 3284 Model 3 Printer, the IBM 3784 Model 1 Line Printer, or the IBM 3767 Model 2 Communication Terminal.

Input to a host application program, such as a purchase order entry, can be initiated at a store from an IBM 3275 Model 3 Display Station or an IBM 3767 Model 2 Communication Terminal and then transmitted to the host processor. The purchase order may then be displayed on the 3275 or printed on the 3767, for verification.

### ***Company-Wide Management***

An IBM System/370, located at a central site and connected to store controllers at remote store locations, allows each store in a large retail organization to remain autonomous and yet take advantage of the facilities at the company's data processing center. This communications link provides basic data for billing, customer service, and account control, as well as basic data for sales analysis and other management information applications.

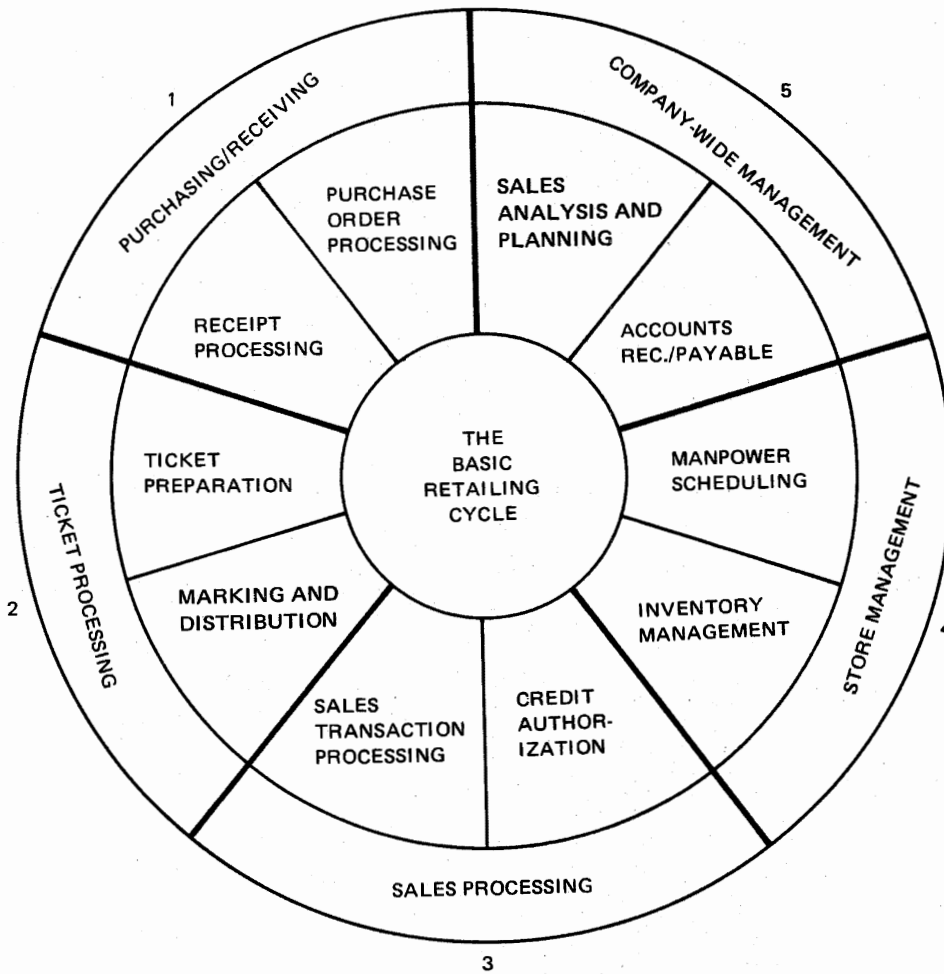


Figure 1-2. The Basic Retailing Cycle

## Chapter 2. IBM 3651 Model A50 or B50 Store Controller and IBM 7480 Model 1 (RPQ EG3129), or Model 2 (RPQ EG3130) Store Controller

The IBM 3651 or 7480 Store Controller is the focal point of data management in the store. The IBM 3651 Store Controller is available in two models; the A50 (with 5 megabytes of disk storage) and the B50 (with 9.3 megabytes of disk storage). The IBM 7480 Store Controller is also available in two models: the Model 1 (with 18.6 megabytes of storage, using two 9.3 megabyte disks) and the Model 2 (with 27.9 megabytes of storage, using three 9.3 megabyte disks). All features and functions of the 3651 are also available on the 7480. (See Figure 2-1.)

The store controller (either 3651 or 7480) collects data, directs inquiries to its own or host processor files, directs responses to these inquiries to the terminal originating the inquiry, and acts as the communications controller for all attached terminals.

### Collecting Data

The store controller collects data from two sources: the IBM System/370 host processor and terminals. Data is transmitted to the store controller (1) by the host processor during system definition and during normal operation of the IBM 3650 Retail Store System and (2) by the terminals during normal operation. During system definition, the user creates, at the host processor, controller data and files to be transmitted to the store

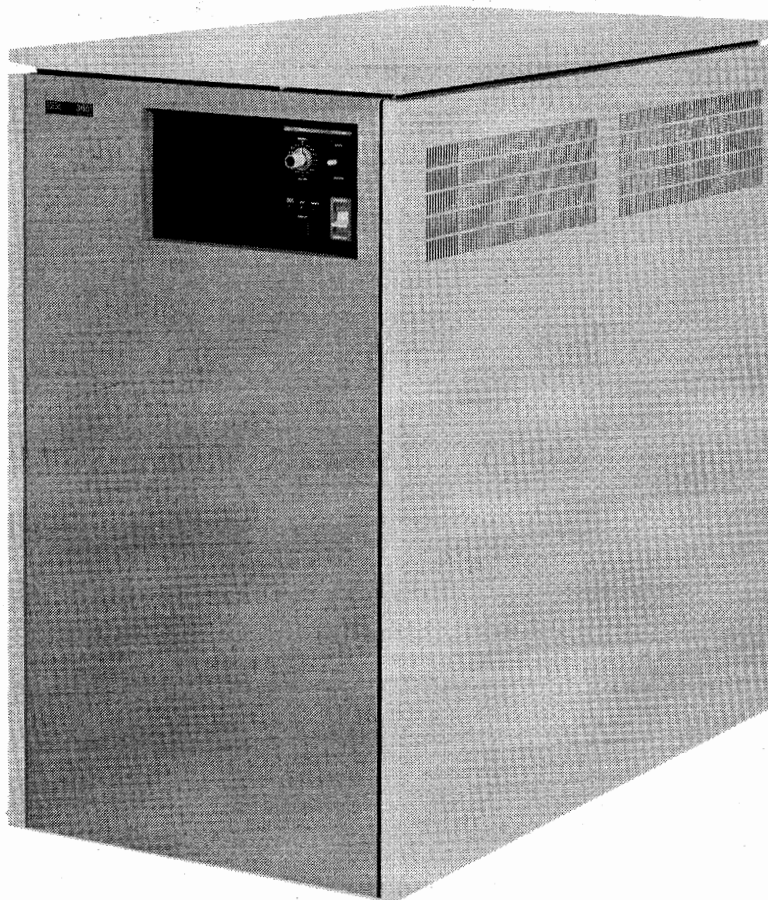


Figure 2-1. Retail Store System Store Controller



controller. *Controller data* is information about the types and number of devices connected to the store controller, options or special features for these devices, basic and selectable functions to be performed by the store controller, and user-written application programs. Files have information needed for functions of the store controller such as credit authorization and price lookup. Files are stored on a disk, which is an integral part of the store controller.

During normal operation of the retail store system, data is collected from terminals and the host processor and stored on the disk. Data from IBM 3653 Point of Sale Terminals is stored on the transaction log. Data from IBM 3275 Model 3 Display Stations, IBM 3657 Ticket Units, and the host processor is stored in other designated files. For example, a message from a display station could be identified as a purchase order to be stored on the purchase order file. A message from the host processor could be stored on a report file.

## Directing Inquiries and Requests

Inquiries and requests about data stored on controller or host processor files can be made from point of sale terminals and display stations. The store controller directs these inquiries to the proper files, obtains replies, and returns them to the terminal making the inquiry. Replies to inquiries on credit authorization, price lookup, security data, balance totals, department/class validation, and flash item sales are made by the store controller. Other types of inquiries may be processed by user-written applications programs, either at the store controller or the host processor. Inquiries in this latter category could be directed to the big ticket item file, customer billing file, or purchase order file.

## Controlling Communications

As many as 191 terminals can be connected to a store controller which supervises the transmission of data back and forth between the terminals and files in the store controller. This supervision is automatic, requiring no human interaction other than following normal operating procedures for the terminal. The actual number of terminals connected to the store controller depends upon traffic rates and required response times.

## Standard Features

The store controller incorporates the following standard features:

Controller Storage	40,960.bytes
Disk Storage	5 megabytes (3651 Model A50) 9.3 megabytes (3651 Model B50) 18.6 megabytes (7480 Model 1) 27.9 megabytes (7480 Model 2)
Local Store Loop Feature # 1	Allows the attachment of one in-store loop.
Host Communications Feature	Provides for transmission to and from a properly equipped System/370.
CE/Operator Panel	A multiple-purpose panel for retail store personnel and service personnel.
Audible Alarm	Activated when predetermined events require operator attention or intervention of system operation.
Controller Storage Save	Critical areas of controller storage are automatically written on two areas of the integral disk unit when a power failure is detected.

## Special Features

### Date Change At Midnight

Release 3.2 incorporates an automatic date change at midnight at the store controller. All dates are provided for, including the added day in leap year (February 29th). The automatic date change enables the current date to appear on reports printed during off-hours operations. 3653 terminals must have power turned off, and then be reinitialized to pick up the automatically changed date from the store controller.

Following is a list of special features that can be installed on the IBM 3651 Store Controller or the IBM 7480 Store Controller.

### Controller Storage Increment Features

(Maximum of two increments per store controller):

First Increment – 8,192 bytes	Total Storage – 49,152 bytes
Second Increment – 8,192 bytes	Total Storage – 57,344 bytes

Storage Increment Type I	8,192 bytes (Maximum of one per controller)
Storage Increment Type II	16,384 bytes (Maximum of three per controller)
Storage Expansion Feature	16,384 bytes (Maximum of one per controller provides for expanding storage beyond 57,344 bytes)

The Storage Increments Type I and Type II of controller storage can be configured to allow a maximum of 106,496 bytes of storage, which can be used for IBM basic functions and for user-written application programs.

For the various configurations and availability of the features, see your IBM sales representative.

### Local Store Loop Feature # 2

Allows a second local store loop to be attached to the store controller

### Local Store Loop Feature # 3

Allows a third local store loop to be attached to the store controller

### Remote Store Loop Feature # 2

In lieu of Local Store Loop Feature # 2 -- provides online service for a maximum of 64 terminals, at up to three remote sites, connected in a point-to-point configuration using 3659-1s; or up to 12 remote sites, connected in a multipoint configuration using 3659-2s

### Remote Store Loop Feature # 3

In lieu of Local Store Loop Feature # 3 -- provides online service for a maximum of 64 terminals, at up to three remote sites, connected in a point-to-point configuration using 3659-1s; or up to 12 remote sites, connected in a multipoint configuration using 3659-2s

### 9600 bps Transmission Speed

Available on either local store loop 2 or 3, but not on both; allows an IBM 3275 Model 3 Display Station equipped with the special 9600 bps Transmission Speed feature to be attached to the special 9600 bps loop. This provides faster screen display. The 7481 may also be used on the 9600 bps store loop, for the transfer of data files to and from the store controller (under control of the user program).

Synchronous Clock

Allows a 3651 or 7480 Store Controller to be cable-connected (maximum of 100 cable feet) to an IBM 3704 or 3705 Communications Controller without requiring modems or communications facilities.

IML Write Adapter Feature

Allows a store to record, at the store controller, initial machine loads for its 3653 terminals. The recordings are made on a store-provided tape cassette recorder/player. If the store controller becomes unable to provide initial machine loads to the 3653 terminals, the tape cassettes are used with the 3653 Read Adapter feature for IML backup.

For more information on the store controller IML Write Adapter feature and the 3653 IML Read Adapter feature, refer to "Initialization Backup" in Chapter 3.

3784 Attachment Feature

Allows attachment of one 3784 Line Printer directly to the store controller. The 3784 can be located up to 15 cable feet from the store controller.

## Operator's Panel

The operator's panel is a multiple-purpose panel for retail store personnel and service personnel. Retail store personnel can turn the system on or off from the panel and run problem determination tests. Service personnel can run extensive online and off-line diagnostic tests from the same panel. The panel is shown in Figure 2-2.

A description of the operator's panel controls is as follows:

POWER switch

This switch controls the primary power to the store controller.

POWER indicator

This indicator comes on when power is applied to the store controller.

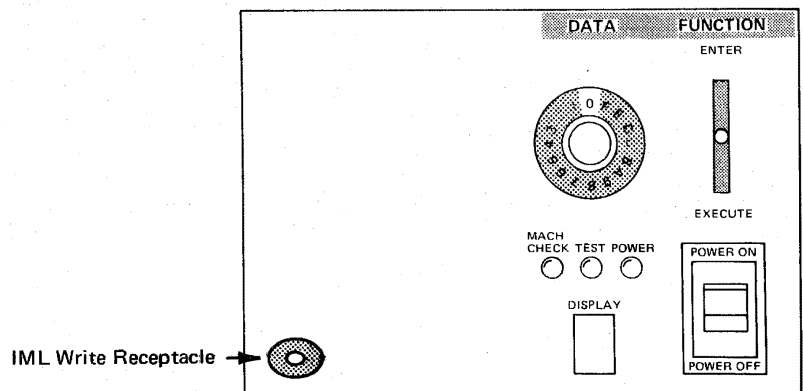


Figure 2-2. Store Controller Operator's Panel

**MACH CHECK indicator**

This indicator comes on when an error is detected that requires operator intervention. It may also come on during diagnostic testing, in which case no operator intervention is required.

**TEST indicator**

When this indicator is on, one of the following conditions is occurring:

Diagnostic testing is in process (the indicator blinks during tests)

The store controller is being initialized (the indicator is on constantly during initialization)

Certain displayable errors may be occurring (the indicator is on constantly, for the duration of the error).

**DISPLAY window**

Used to display single hexadecimal characters, for a visual readout of input requests, operator message codes, and other communications.

**FUNCTION switch**

This switch has three positions: normal spring-loaded center and momentary up or down positions. The up (ENTER) position defines the setting of the 16-position DATA switch as data. The down (EXECUTE) position defines a mode that has been selected by the DATA switch.

**DATA switch**

This 16-position switch allows the user and service personnel either to enter data or to communicate with the system. The user can invoke special support programs as well as problem determination procedures.

**IML Write receptacle**

This receptacle is used to plug in the tape cassette recorder to record IML backup tapes. This receptacle is installed as a part of the optional IML Write Adapter feature.

## IBM 3784 Model 1 Line Printer

The IBM 3784 Model 1 Line Printer, shown in Figure 2-3, is a high-speed printer used to print administrative reports, messages, and other data required in the store. The 3784 printer is attached directly by its own cable to a store controller equipped with a Printer Attachment special feature. The line printer can print at three speeds ranging from 80 lines per minute to 155 lines per minute, depending upon the number of characters in the character set being used. The following chart lists character sets and their corresponding speeds:

Character Set	Lines Per Minute
48	155
64	120
94	80

The character set desired must be specified when the 3784 is ordered. The character sets are on a continuously rotating metal print belt. Additional print belts can be purchased and can be changed by the operator. When the 48- or 64-character set belt is used, the 3784 converts lowercase characters to uppercase characters and prints them.

The maximum print-line length on the 3784 is 132 characters. Inking is supplied from a ribbon. Pin feed forms tractors feed one-part to six-part, edge-punched, continuous paper forms. The forms tractors are adjustable for forms ranging from 3-1/2 to 15 inches (88,9 to 381 mm) wide. For forms design considerations for this printer, refer to Appendix A.

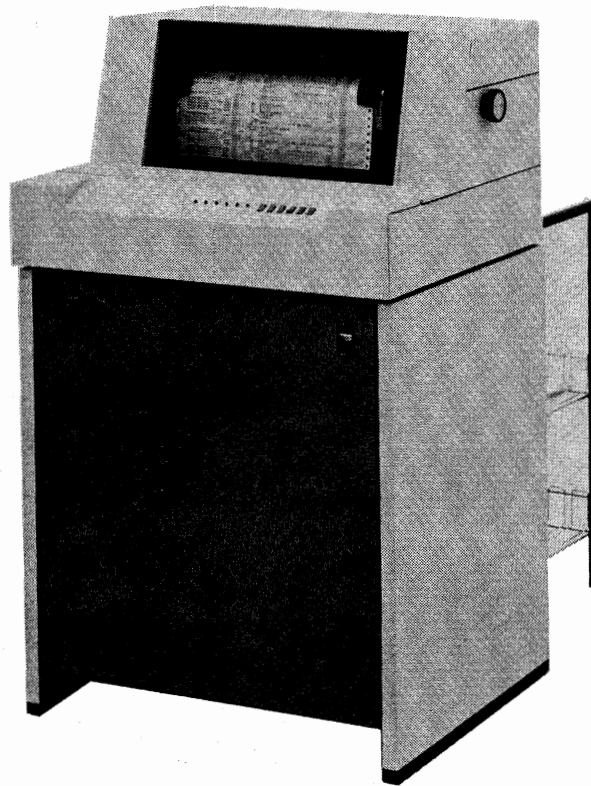


Figure 2-3. IBM 3784 Model 1 Line Printer

## **3784 Basic Operation**

The 3784 Line Printer operates under control of the batch print function. Batch print controls in-store printing of:

- Reports from the host processor that have been stored on the disk in the store controller.
- In-the-store reports generated by the store controller and stored on the disk.
- Reports generated from user-written programs executing in the store controller.
- Administrative messages sent from the host processor to the store controller and stored on the disk in the store controller.

Reports from the host processor may be sent to the store controller's disk during the non-store hours. In-the-store reports may be generated during the non-store hours from data accumulated during sales hours and are stored on the disk to await batch print operations.

### ***Special Features***

#### **Additional Print Belts**

Additional print belts are available for the 3784 printer. These belts are available for the 48-, 64-, and 94-character sets for the countries as shown in Appendix C.

#### **Forms Stand/Stacker**

A forms stand/stacker is available for easier handling of continuous fan-fold documents.



## Chapter 3. IBM 3653 Point of Sale Terminal

The IBM 3653 Point of Sale Terminal shown in Figure 3-1 is an interactive terminal and a data collector, as well as a cash register. It improves customer service by processing transactions quickly and accurately and collects data pertaining to merchandise items, sales, money, and accounts receivable. In the process, it maintains control over cash and sales audit data.

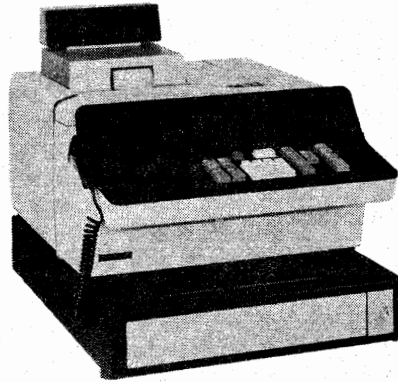


Figure 3-1. IBM 3653 Point of Sale Terminal

The IBM 3650 Retail Store System can collect data at the point of sale, communicate with the store controller and host processor on an interactive basis, and process (both at the store and host processor) the data collected. These advantages extend the functions of a point of sale terminal beyond the functions of a cash register.

Normally, the point of sale terminal operates online with the store controller. It can operate in offline mode if communication with the store controller is interrupted. This offline operation is equivalent to a standard cash register operation. In offline mode, the terminal continues to process customer transactions while providing a printed journal marked for backup and allowing manual credit authorization. (For an introduction to the 7481 Data Storage Unit, see Chapter 7.)

### Options

A lockable till cover is provided as an option. Tills with movable partitions can also be provided as an option.

A keylock option can be specified for the journal roll. This keylock is the same for all point of sale terminals within a retail store system.

Identical cash drawer locks can be provided as an option. The keylock may be the same for all point of sale terminals within a retail store system.

### Special Features

#### *Magnetic Wand Reader*

A magnetic, hand-held wand reader that can read magnetic stripes on merchandise tickets, credit cards, and employee badges is available as a special feature.



## ***OEM OCR Wand Attachment (RPQ 858816)***

This RPQ is available to allow the attachment of an OEM optical character recognition (OCR) device and wand. The OEM OCR wand reads standard OCR characters on merchandise tags and labels. The OEM device must provide signals in accordance with IBM's specifications for the RPQ. The RPQ provides an EIA-type cable with a 25-pin connector, to interface with an OEM OCR wand device.

## ***OEM UPC Wand Attachment (RPQ 858983) (USA Only) – Release 3.2***

The OEM UPC Wand Attachment feature RPQ provides an alternate method of wanding at the 3653 terminal. A 3653 equipped with this RPQ allows the attachment of an Original Equipment Manufacturer (OEM) Universal Product Code (UPC) wand unit to accept wanded UPC bar code label entries. Any one 3653 terminal may be equipped with only one type of wand, but a system may have a variety of magnetic, OCR, and UPC equipped 3653 terminals.

This wand attachment RPQ feature supports UPC-Version A (number system 0, 2, and 3) and UPC-Version E label formats. Long and short, in-store and sources-marked labels may be processed by the 3650 system. Information from in-store marked item labels, salesperson identification number labels, and authorization code labels can be accepted by your system.

Refer to the *Programmer's Guide* and the *Subsystem Definition Guide* for background and detailed information.

## ***IML Read Adapter***

Normally, during the operator sign-on procedure, the point of sale terminal receives initialization data from the store controller. If the store controller is unable to provide initialization data, the point of sale terminals can be initialized using the IML Read Adapter feature. This feature is installed on a point of sale terminal. No sales or other nonsales functions can be performed by this terminal while it is providing initialization data to other terminals on the store loop.

## ***Functional Expansion***

This feature increases the capacity of the point of sale terminal to handle more combinations of basic and selectable functions at the point of sale.

## ***Totals and Transaction Counter Retention***

RPQ 858888 enables the user to save specific transaction data during a loss of power at the 3653 Point of Sale Terminal. Four terminal totals (cash, noncash, gross plus, and gross minus), and the transaction counter are saved in a self-contained, battery-powered storage unit in the 3653. The battery may be replaced by the user. This RPQ may be selectively installed on any or all 3653 terminals at the most current EC level at the time of Release 3.1 shipment.

## ***Standard Keyboard***

The standard keyboard shown in Figure 3-2 is the interface between the salesperson and the store control system. It permits the salesperson to use the point of sale terminal not only as a cash register, but also as a data entry and inquiry device. Data entered at the keyboard is transmitted to the store controller, from where it can be sent to the host processor. Salespersons can also enter their employee identification through the keyboard.

## Numeric Keys

The numeric keys (keys labeled 0 through 9) are used to key numeric values (such as the item code, price, and the amount tendered) into the store system for processing. These keys are also used as function keys, depending upon their sequence in the sales transaction.

## Function Keys

The function keys are used to modify, or give added information on, a specific entry. These key actions control the format of the entry transmitted to the store controller.

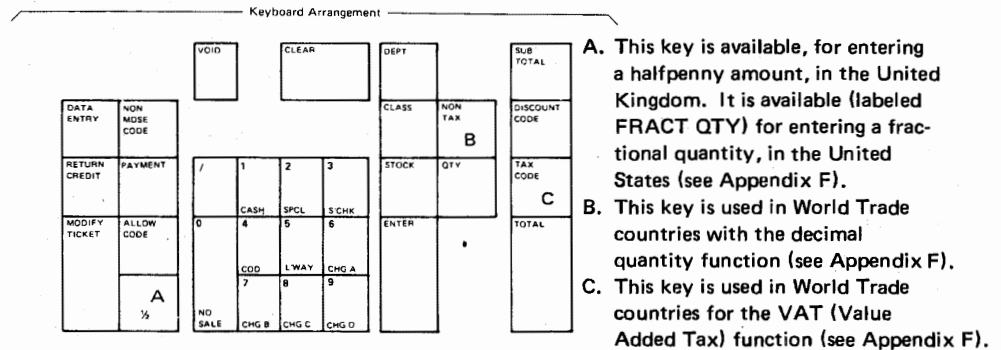
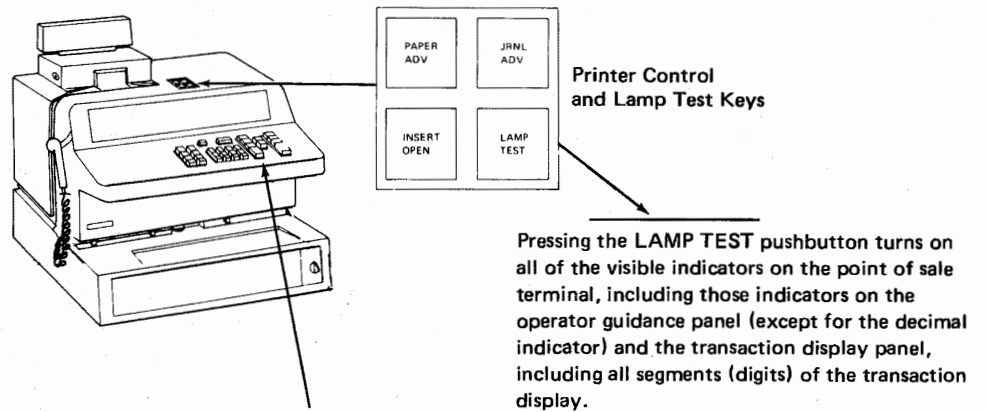


Figure 3-2. Point of Sale Terminal Standard Keyboard and Printer Control Keys

## Key Descriptions (Standard Keyboard)

The keys and the functions they perform are as follows:

### NON-TAX

This key, when pressed, indicates that the next amount entered is nontaxable. In World Trade countries, this key is used with the decimal quantity function.

### VOID

Pressing the VOID key and then immediately pressing the ENTER key voids the immediately preceding merchandise or nonmerchandise entry.

Pressing the VOID key and then immediately pressing the TOTAL key voids the entire transaction in process. This process is logged on a void file. Department totals and flash items are not updated.

A previous item sale within the current transaction can be voided by using the VOID key.

The store has the option of requiring an authorization code to be entered when the VOID key is used in sales mode.

ENTER

This key is used to complete almost every keying sequence. It causes the point of sale terminal to print, and it updates the transaction accumulators.

This key, when pressed while the TRANSACTION TYPE indicator is on, allows the terminal to go directly to non-sales mode. The ENTER COMMAND message prints on the transaction journal and on the cash receipt and the DATA ENTRY indicator comes on.

0  
NO SALE

This key, when pressed while the TRANSACTION TYPE indicator is on, opens the cash drawer, prints the header on the transaction journal and cash receipt, and transmits a record of this action to the store controller.

1        2  
CASH or SPCL

These keys, when pressed while the TRANSACTION TYPE indicator is on, allow the terminal to proceed directly to sales mode. The header line is printed on the transaction journal and cash receipt, and the transaction type is transmitted to the store controller.

3  
S'CHK

This key, when pressed while the TRANSACTION TYPE indicator is on following the insertion of a sales form, allows the terminal to go directly to sales mode. The header is printed once on the transaction journal and either once or twice on the sales form at the option of the user. The type of transaction is then transmitted to the store controller.

4  
COD

This key, when pressed while the TRANSACTION TYPE indicator is on following the insertion of a sales form, allows the terminal to go directly to sales mode. The header line is printed once on the transaction journal and either once or twice on the sales form at the option of the user. The type of transaction is then transmitted to the store controller.

To identify a "send" transaction, the salesperson presses the 4 key then a selected transaction key (3-9) while the TRANSACTION TYPE indicator is on. In the header of the sales check, an identifying character (for example, an "S") prints to the left of the transaction type number to identify a send transaction. If the 4 key is not pressed before a selected transaction key (3-9), a "take" transaction is assumed and no character prints before the transaction type number to identify a "take" transaction. The store may choose its own identifying character for a send transaction. The store may also choose to enforce the collection of a fee on a send transaction by a prompt to the salesperson.

5  
L'WAY

This key, when pressed while the TRANSACTION TYPE indicator is on following the insertion of a sales form, allows the terminal to go directly to sales mode. The header is printed once on the transaction journal and either once or twice on the sales form at the option of the user. The type of transaction is then transmitted to the store controller.

6            7  
CHG A, CHG B,  
8            9  
CHG C, CHG D

Any one of these keys, when pressed while the TRANSACTION TYPE indicator is on following the insertion of a sales form, allows a transaction to take place that uses any one of four customer-determined types of charge plans. The terminal prints the header once on the transaction journal and either once or twice on the sales form at the option of the user. The type of transaction is then transmitted to the store controller.

MODIFY TICKET

This key, when pressed, allows the salesperson to modify the quantity and the amount fields of a magnetic wand reader entry.

*Note:* For 3653s with the OEM OCR Wand Attachment (RPQ 858816) installed this key allows the operator to skip to the next valid machine state for the ticket being entered.

RETURN-CREDIT

This key, when pressed before an item identification is entered, allows the terminal to process the transaction for a merchandise item that has been returned.

To improve the control and audit of refunds, the salesperson can itemize the refund of fees, deposits, and payments during the return or cancellation of the associated transaction. The salesperson may use the RETURN-CREDIT key with the PAYMENT key to enter the refund amount of payments previously made.

The salesperson may also use the RETURN-CREDIT key when the FEE AMOUNT or DEPOSIT AMOUNT indicator is on to record the refund of fees or deposits. If a fee is not refunded (on a COD, for example), no amount is entered and nothing prints on the sales check.

The store has the option of requiring an authorization code to be entered with returns and refunds.

DEPT

This key, when pressed, identifies a particular number in a merchandise entry as the department number.

The store has the option of requiring a department number to be entered with the first keyed line item of each sales transaction. Subsequent line items in the transaction do not require a department number. This allows the point of sale terminal to serve multiple departments while ensuring that the correct department number is entered.

CLASS	This key, when pressed, identifies a particular number in a merchandise entry as the class number.
STOCK	This key, when pressed, identifies a particular number in a merchandise entry as the stock number.
	The store has the option of having the terminal perform a modulo check on the department number, or the class number, or the combined dept/class/stock number of a keyed item.
QTY	This key, when pressed, allows a specified number of items to be entered. If the key is not used, a quantity of 1 is assumed. A quantity of zero is invalid. The maximum quantity that can be entered is 999.
/(diagonal)	This key, when pressed, allows special quantity prices (example: 3/89¢) to be entered. If the slash (/) field is omitted, the price is assumed to be for a unit.
	It is also used as a separator character for nonsales file related function.
NON-MDSE CODE	This key, when pressed, allows nonmerchandise entries to be made during a sales transaction.
CLEAR	This key, when pressed, clears the numeric entry just made and allows the salesperson to re-key that entry.
ALLOW CODE	This key, when pressed, allows an allowance entry (such as for damaged merchandise) during a sales transaction.
	The store has the option of requiring an authorization code to be entered with an allowance.
SUB TOTAL	This key, when pressed, causes a subtotal of the current transaction to be automatically calculated and displayed.
DISCOUNT CODE	This key, when pressed, allows a discount entry during a sales transaction. Discounts may be (1) by line, (2) by a group of lines, or (3) by transaction. Any discount calculation greater than \$838.86 causes the transaction to be voided. Only one discount is allowed per transaction.
TAX CODE	This key, when pressed, allows a tax amount to be key-entered. If no amount is entered and the Enter key is pressed, the tax amount may be automatically computed by the system. If the automatic tax calculation exceeds \$10,485.00, the transaction is voided. Only one tax per line item is allowed.

## TOTAL

This key is pressed when there are no more sales items to be entered for the current transaction. Pressing it causes the sales tax to be calculated, the transaction display to be updated, and the sales total may be printed (depending upon the type of transaction).

The cashier mode terminal uses this key for signing off at transaction time, and for signing on at salesperson time.

## DATA ENTRY

This key, when pressed, allows supplementary data (such as warranty number) to be entered by the salesperson, without affecting the sales transaction in progress. The data is printed on the text line of the transaction journal and the sales receipt or sales form and is transmitted to the store controller. It is also used to indicate the end of a sequence of data fields for some nonsales functions.

## PAYMENT

This key, when pressed, allows the amount of payment to be entered for a COD, layaway, or charge transaction.

The salesperson may use the RETURN-CREDIT key with the PAYMENT key to enter the refund amount of payments previously made.

The store has the option of requiring an authorization code to be entered with returns and refunds.

## Modifiable Keyboard (Release 3.1)

The modifiable keyboard is designed to aid the user in faster keying and in customizing the keyboard to the user's requirements. Figure 3-3 shows the key layout, as the keyboard is shipped from IBM. The numeric keys and the CLEAR key have fixed locations; the remaining 36 function and department keys may be arranged to meet the user's needs.

The keyboard has 48 keystem positions. (A keystem is the post upon which a keytop is installed. Two keystems are required for a vertical, double-size keytop.) The replacement of a double-size keytop with a single-size keytop (or vice versa) requires that you contact your Marketing Representative. Additional blank keytops of various colors and heights can be ordered from IBM. Both single-size and double-size blank keytops are available in five colors and in three heights.

Selectable functions "Modifiable Keyboard" and "Department Keys" support the modifiable keyboard. Some of the advantages of the modifiable keyboard are:

- Centrally located numeric keypad (in a fixed position)
- Up to 16 department motor keys
- Selected keys raised to a higher height (three heights)
- Color-coded keys (five colors)
- Certain relocatable and designatable keys
- Changeable keytops

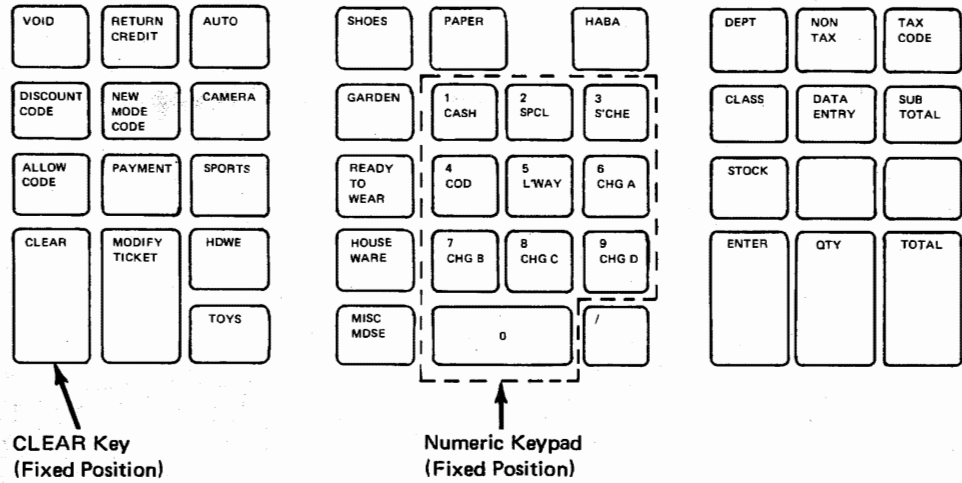


Figure 3-3. Point of Sale Terminal Modifiable Keyboard (Example)

## Printer

The printer provides either cash receipts or sales checks and a journal of all transactions (see Figure 3-3). Cash receipts and sales checks are itemized statements of merchandise sold during a transaction, including item numbers, amounts, and totals.

Sales checks are preformatted forms, on which certain types of sales transactions such as a charge, cash-send, return, or layaway, are recorded at a terminal. The following push-buttons are used by the salesperson to operate the sales check printing device.

### PAPER ADV

This pushbutton enables the salesperson to manually advance the cash receipt or the sales check to the next line.

### INSERT OPEN

This pushbutton allows the salesperson to insert or remove a sales check.

A journal of all transactions is printed for the purposes of control and reconciliation.

### JRNL ADV

This pushbutton enables the salesperson to manually advance the transaction journal to the next line.

An optional lock (special feature) permits only authorized personnel to have access to the transaction journal.

The printer has three print stations that can print a maximum of 30 characters per line (see Figure 3-5 for the printer character set). The cash receipt station is on the right; the transaction journal station is in the center; and the document (sales check) insert station is on the left (see Figure 3-4). The cash receipt and transaction journal stations use roll paper. The document insert station uses inserted forms. All three stations use the same ribbon. Specifications for these user-supplied expendable items are given in Appendix A.

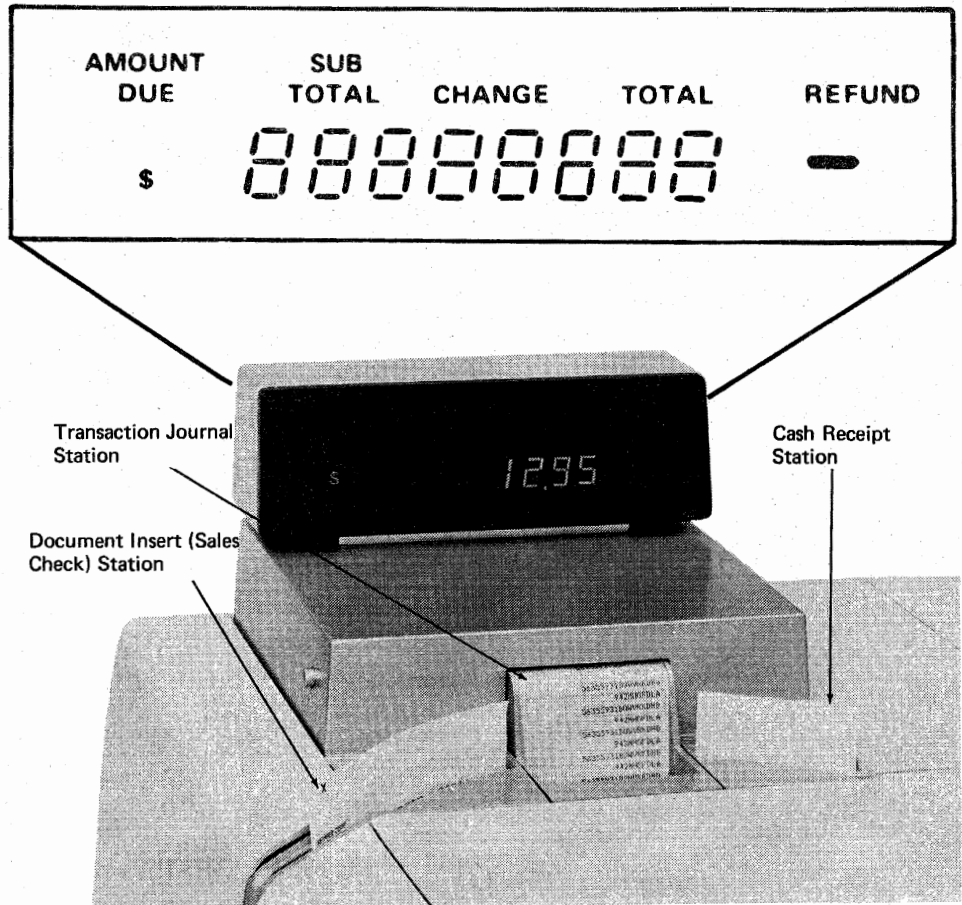


Figure 3-4. Point of Sale Terminal Transaction Display and Printer Stations



Figure 3-5. Point of Sale Terminal Printer Character Set (English-U.S.)



## Cash Drawer

The cash drawer is fitted with a removable till tray (the entire cash drawer can also be removed from the terminal). Bill compartments in the till have spring-loaded hold-downs. An option (special feature) lockable till cover is available.

A standard till with fixed partitions is provided to fit United States and Canadian currency. A till with movable partitions to accommodate the various sizes of currencies and cash-like tender, is optional.

A three-position lock next to the cash drawer prevents unauthorized persons from having access to the cash drawer and keyboard. One position of the lock is the normal operating position; a second position allows the cash drawer to be opened manually; and a third position locks the cash drawer and the keyboard electronically. The user may order multiple terminals that lock with the same key. A group of unique lock numbers has been reserved for this purpose.

## Transaction Display

The transaction display shown in Figure 3-4 gives the customer and the operator a view of the item prices, the dollar amount due (subtotal or total), the amount tendered, and the change due. Large, easy-to-read numbers allow the customer to verify the cost of each item during the transaction. The five captions (AMOUNT DUE, SUB TOTAL, CHANGE, TOTAL, and REFUND) are supplemented by a dollar sign (\$), a minus sign (-), and a decimal point.

## Operator Guidance Panel

The operator guidance panel shown in Figure 3-6 guides the salesperson through the transaction. This guidance panel helps an inexperienced operator through the most complex transaction.

### *Guidance Indicators*

The sequence of the guidance indicators varies with the different types of transactions that can be recorded on the point of sale terminal. See *IBM 3650 Retail Store System Sales Operations Guide*, for step-by-step instructions for the various types of transactions.

### *Status Indicators*

The status panel shown in Figure 3-6 indicates the status of the point of sale terminal at any time power is applied to the terminal. Definitions of the status indicators are as follows:

#### JOURNAL ROLL

This indicator comes on when the journal roll takeup reel is full or the end of the journal roll paper is sensed. The 3653 keyboard locks to prevent any further entry of data, a tone sounds, and the JOURNAL ROLL and CLEAR-RE-ENTER indicators on the guidance panel come on. When the journal roll is replaced, operation can proceed by pressing the CLEAR key.

OFF-LINE

This indicator comes on when the terminal is not in communication with the store controller. This is *not* the normal mode of operation.

WAIT

When this indicator comes on, the keyboard is locked and the salesperson cannot use the terminal.

READY

When this indicator comes on, it indicates that the terminal is ready for input from sales personnel.

STATUS PANEL

GUIDANCE PANEL

READY	SALESPERSON	TRANSACTION TYPE	ACCOUNT NO.	DATA ENTRY	CLEAR-RE-ENTER
WAIT	DEPARTMENT		CLASS	STOCK	INSERT FORM-CLEAR
JOURNAL ROLL	QUANTITY	AMOUNT	AMOUNT TENDERED	FEE AMOUNT	DEPOSIT AMOUNT
OFF-LINE	WAND	MISC ENTRY TOTAL	AUTHORIZATION CODE	ORIGINAL SALES-PERSON	



Figure 3-6. Point of Sale Terminal Operator Guidance and Status Panel

## Wand Reader (Special Feature)

Either of two types of hand-held wand readers can be installed on the 3653. The Wand Reader feature provides a wand that can read magnetically encoded information. The OEM OCR Attachment RPQ (868816) allows the attachment of an OEM optical character recognition (OCR) device and wand to the 3653.

Wand readers help to assure collection of accurate sales transaction data and decrease the time required to complete a sales transaction. The Wand Reader can be fitted to either the left or right side of the terminal. It allows item and salesperson identification and accounts receivable data to be entered into the system. The wand reader, when passed over the tickets attached to boxes, bags, packages, and hanging goods, can read the information without the necessity of removing the ticket. It can also read magnetically encoded credit cards, employee identification badges, which have been encoded using delta distance code.

The OEM optical character recognition wand reads standard OCR characters on merchandise tags and labels.

A holder is provided on the 3653 for the magnetic wand, but not for the OEM OCR wand.

## IML Read Adapter (Special Feature)

If the store controller is unavailable or becomes unable to provide initialization data (this process is also called an initial machine load - IML) to the 3653 terminals, the 3653 IML Read Adapter feature (Figure 3-7) can provide the IML to 3653 terminals on the same store loop. The IML read feature consists of a tape cassette recorder/player provided by the user, an IBM-provided cable for attaching the recorder to the terminal, and supporting hardware in the terminal. The IML Write Adapter feature on the store controller is a required, companion feature that is used to record the 3653 IMLs on the tape cassette.

The operation of the IML backup features involves three procedures, (1) recording the IML backup tape at the store controller, (2) verifying IML data on the tape at the terminal with the IML read feature installed, and (3) loading the 3653 terminals with IML data from the terminal with the IML read feature. For operating details of IML backup, see the *IBM 3650 Retail Store System Administrative Operations Guide*.

The user-provided tape recorder can be chosen from a number of commercially available cassette models. The model chosen should have a separate "record" and "playback" receptacle. Specifications for acceptable recorders are given in Appendix D. The following are examples of recorders that meet these specifications:

- Bell and Howell Educator Series 3080
- General Electric Models M8445B or M8444B
- Norelco\* Model 1420

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\*Trademark of North American Phillips Co., Inc.

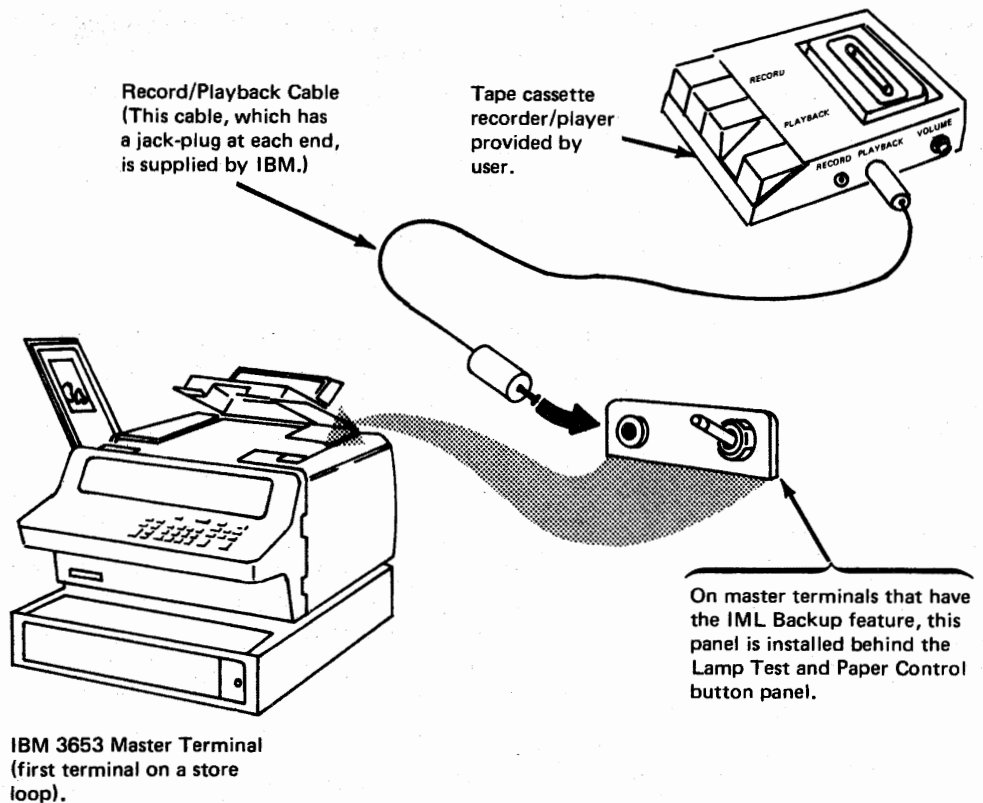


Figure 3-7. 3653 IML Read Adapter Feature.

## 3653 Basic Functions

The three basic functions of the point of sale terminal are initialization, sales support, and administrative support. Using these, the point of sale terminal maintains totals for cash and sales audit data and provides editing and formatting for the printer.

Sales support is directly related to the sales transaction taking place at the point of sale terminal. Administrative functions give support to the sales function but are not directly related to a specific sales transaction. When the terminal is engaged in a sales support function, it operates in sales mode. When it is engaged in administrative support functions, it operates in nonsales mode. For operating a 3653 in sales support mode, see the *IBM 3650 Retail Store System Sales Operation Guide*; for nonsales mode, see the *IBM 3650 Retail Store System Administrative Operations Guide*.

### *Initialization*

When power is turned on, an automatic self-check by the terminal determines that it is operational. If the terminal is operational, a sequence of operator guidance lights indicates a step-by-step sign-on procedure, for the operator.

If the terminal is online, it requests initialization from the store controller. The controller first checks for duplicate addresses. It then checks the security code to verify (1) that an authorized sign-on is being used, and (2) that the correct address is being used, so that the correct initialization data will be sent to the terminal.

The last transaction numbers from the terminal and the controller are compared, to determine if all transactions have been recorded. Any discrepancies are logged in the store controller. After this has been done, the terminal is automatically initialized online. When this has been done, the terminal is ready for operation in sales mode.

If the terminal is offline, the OFF-LINE status indicator (shown in Figure 3-5) comes on, together with a guidance indicator, indicating to the operator that the terminal must be initialized manually.

## Sales Support Functions

Sales support functions include:

- Sales transaction
- Transaction logging
- Credit authorization
- Price lookup
- Point of sale totals checkpoint
- User-Defined Table of Descriptors

## Sales Transaction

The sales transaction function:

- Guides the operator through the keying sequences necessary to complete a sales transaction
- Records the details of a sales transaction on a journal tape
- Calculates taxes and discounts on item amounts
- Displays the total amount due and the amount tendered, and calculates and displays the amount of change due, for cash sales
- Provides the customer with a receipt for a cash sale, or a sales check for a charge sale and other types of transactions

Accumulates totals. Totals are accumulated for a sales transaction and for a sales period, to assist in taking cash and total balance from a register during a sales period or at the end of a sales period. The standard basic sales period accumulators are: gross plus, gross minus, net cash, and net noncash. In addition, the terminal keeps a count of all transactions. This transaction count is printed at the beginning of each transaction, in the header line (see Figure 3-9). The following paragraphs describe the standard basic totals and accumulators and the action that is taken to calculate them. A selectable function is available which will cause the gross plus and gross minus totals accumulated to be sales plus and sales minus. For further discussion refer to the Sales Period Totals Option selectable function.

The *balance due plus* is a total of plus item entries, including any net plus tax that has been calculated or entered. It is added to the gross plus accumulator at the end of the transaction and then cleared.

The *balance due minus* is a total of minus item entries, including any net minus tax that has been calculated or entered. It is added to the gross minus accumulator at the end of the transaction and then cleared.

*Taxable sales plus* is a total of the plus taxable sale entries; it is used in the net tax calculation.

*Taxable sales minus* is a total of the minus taxable sale entries; it is used in the net tax calculation.

The *gross plus total* contains the sum of the positive transaction balance due entries, including any net positive tax that has been calculated or entered.

The *gross minus total* contains the sum of the negative transaction balance due entries, including any net negative tax that has been calculated or entered.

*Net cash* is the total of all cash sales, deposits, and payments.

*Net noncash* contains the sum of the net balance due on COD, layaway, and charge transactions.

These accumulator totals can be printed by the point of sale terminal by using the point of sales totals readout and reset functions described briefly in this chapter.

## **Types of Sales Transactions and Related Functions**

A salesperson can perform and can record a variety of sales transactions, using the 3653 Point of Sale Terminal. The basic types of transactions, together with a brief definition of each, follow. These can be combined to make many different transaction sequences.

Cash Take	The customer pays cash (or check) and takes the merchandise.
Cash Send	The customer pays with cash or by check and the merchandise is to be delivered.
Charge	The customer wishes to charge the merchandise is delivered. account.
COD (Cash on Delivery)	The customer agrees to pay when the merchandise is delivered.
Layaway	A method of deferred payment in which the merchandise is held by the store until it is completely paid for ( <i>will call</i> is another name sometimes applied to layaway).
Fee Collection	During a COD or layaway transaction, the salesperson is prompted to enter a fee amount after pressing the TOTAL key. The store also has the option of prompting or enforcing a minimum fee entry on a send transaction.
Merchandise Function	Any one of 21 merchandise options can be used to adapt the of sale terminals for specific types of merchandise functions. Only one of the 21 options can be used for transactions at any one terminal.
Modulo Check Function	On key-entered merchandise numbers, the store has the option of having the terminal perform a modulo check on the department or class number, or on the combined dept/class/stock number. A separate modulo check of the department number and/or class number may be specified for the same line item in addition to the modulo check on the combined dept/class/stock number.  A modulo 10 check is provided by IBM with this function. The user may choose to supply an optional modulo table.
Modify Ticket Function	This is used to modify either a quantity entry, a unit price entry, or both a quantity and a unit price entry, in connection with wanding a merchandise ticket.
Data Entry	This allows the salesperson to enter up to 15 characters of numeric data (code, warranty number, etc.) during a sales transaction, without affecting that transaction.
Nonmerchandise Function	This allows nonmerchandise entries (such as alteration charges) to be entered during a sales transaction.

Allowance	<p>A downward adjustment in the selling price of merchandise because:</p> <ol style="list-style-type: none"> <li>1. The merchandise is damaged.</li> <li>2. The merchandise is a "promotion" item, at a special price.</li> <li>3. A trade-in has reduced the price charged.</li> </ol> <p>The store has the option of requiring an authorization code to be entered with an allowance.</p>
Discount	<p>A discount given to a customer or an employee on the purchase of merchandise. Restrictions: (1) only one discount per transaction is allowed and (2) a discount function cannot be made following a payment or following a manual or automatic tax function.</p> <p>The store has the option of requiring an authorization code to be entered with a discount.</p>
Manual Tax Function	<p>This allows a tax amount to be entered, using the point of sale terminal keyboard.</p>
Automatic Tax Function	<p>This causes the tax to be automatically calculated by the point of sale terminal and added when totals are taken.</p>
Payment Function	<p>This allows the required amount of payment to be entered for a COD, layaway, or charge transaction. It cannot be used in a cash-send transaction.</p>
No Sale Function	<p>This opens the cash drawer for a purpose other than for a sale or a return of merchandise for credit transaction.</p>
Clear Function	<p>This clears a numeric entry just made and allows the salesperson to re-key that entry.</p>
Void Item	<p>This voids a line entry just entered or a line entry previously entered in the current transaction. The correct information can be re-keyed, following the void item function.</p> <p>The store has the option of requiring an authorization code to be entered when a line entry is voided.</p>
Void Transaction Function	<p>This voids the entire transaction in progress. If necessary, a new sales check can be inserted and the correct information re-keyed.</p>
Multiple Pricing Function	<p>This is used to enter the quantity and amount entries of items priced in multiples (example: 5/99¢) in any merchandise or modify-ticket function.</p>

### Offline Indication on the Sales Check

When the terminal is operating offline, a three-character indication (XXX) prints on the transaction journal and on the inserted document in the leftmost print positions. The indication prints on a line by itself before the total line and on the transaction journal before the sales period totals. If the document insert station is not in use, the offline indication prints on the transaction journal and on the cash receipt.

When the 3653 transaction data is logged by the 7481 Data Storage Unit, the indication is XXXL, to differentiate between a transaction that is performed offline and one that is logged by the 7481.

### Automatic Price Override

For Founders' Day sales or other short term sales, the store can specify that all transactions entered with or without a price from a given location be referred to a price lookup file in the store controller.

If the price is found in the price lookup file for the item entered, the store controller substitutes the file price for the entered price, if any.

If no price is found in the lookup file for the entered item, or, if the terminal is offline, the entered price is used.

If no price is entered at the terminal and no price is found in the lookup file, the CLEAR-RE-ENTER guidance indicator comes on at the terminal.

The terminal does not request a price override for merchandise options that include use of the RETURN or VOID keys. A price override function is indicated by the printing of the "↓" character in the rightmost printing position of the item line on the transaction journal and the cash receipt or sales check. Refer to Figure 3-12 for an example.

### Option to Mask Journal Roll Totals

As previously mentioned, a basic function of the terminal is the printing of four sales period totals on the transaction journal at the end of each transaction. The four totals are:

gross sales plus	gross sales minus
net cash	net noncash

This optional function allows the store to prepare a mathematical 9's complement mask for the total fields to scramble the totals to make them undecipherable except by those few who know the composition of the mask. The mask may be changed, for example, on a daily basis. In this arrangement, the totals print on a single line (seven positions per total):

(gross plus) (gross minus) (cash) (noncash)  
XXXXXXXXXXXXXXXXXXXXXXX XXXXXXXX

This function makes it more difficult to determine the amount of cash in the terminal while still properly recording the totals in the terminal. Only the printouts are masked. This option can also be used if the Sales Period Totals Option selectable function is implemented.

See *IBM 3650 Retail Store System Programmer's Guide*, for programming information pertaining to the various types of transactions. For operation information on the types of sales transactions, see *IBM 3650 Retail Store System Sales Operations Guide*.



## Transaction Logging

Transaction logging provides a history file of retail store activity. Its primary purpose is to provide input to analysis programs that can be written by the user for execution at the store controller or host processor. All valuable data is logged chronologically in the store controller as it is available.

Store controller and terminal messages that provide sufficient data to reconstruct a sales transaction are logged. Not all message types and responses are logged. Price lookup is an example of a message that is not logged. Some messages that occur during the nonsales mode of operation can also be logged. These messages, like the sales transaction messages, form a part of the record of the activity at the point of sale. A nonsales mode example is the logging of loan or withdrawal messages.

Data on the transaction log can be processed by the store controller or the host processor. When requested by the host processor, the log data is transmitted to the host processor.

A complement to the transaction logging function is the void transaction logging function. Voiding a current transaction takes place while the point of sale terminal is operating in sales mode; voiding a previous transaction takes place in nonsales mode.

Transactions logged by the 7481 and transmitted to the store controller, when communication is restored, are placed in a special class file that is separate from the transaction file. The transaction file is maintained to log transaction data while the 3653s are online.

## Credit Authorization

The keyboard shown in Figure 3-2 shows data entry keys 6, 7, 8, and 9 as charge keys (CHG A, CHG B, CHG C, CHG D). These four keys represent the types of charge plans that a user assigns to the keys when defining the system. For example, they might represent the store's regular charge plan, a revolving charge plan, an installment plan, and a bank credit card plan.

IBM provides four credit authorization functions to assist the user in implementing the four charge plans defined for the store.

The four credit authorization functions are (1) negative, (2) restrictive, (3) floor limit, and (4) host positive. Credit authorization either takes place when the account number is entered (before merchandise item numbers are entered into the point of sale terminal), when the balance is due (after all items have been entered and the taxes and total have been calculated), or at both. Negative and restrictive credit authorization takes place when the account number is entered. Floor limit and host positive credit authorizations take place when the balance is due.

**Negative:** Negative credit authorization is the searching of a negative credit file at the store controller. Account numbers are supplied by the store credit department. If the search finds the account number in the file, whatever action previously defined by the user during system definition is taken.

**Restrictive:** Restrictive credit authorization is the searching of a store controller file that contains account numbers and status codes. A status code might indicate a stolen credit card, a card restricted to use by "Mr. only", or a card that is restricted to a

certain limit. This code is established by the user during system definition. The status code can be changed for any account number by the user, at any time, by using the data maintenance function of the retail store system. The change can be made at the point of sale terminal or at an IBM 3275 Model 3 Display Station. The data maintenance function is described in this chapter and in Chapter 5.

If a restrictive credit search finds the account number, action previously defined by the user during system definition is taken. If the salesperson must contact the credit department before proceeding, IBM offers another function, called *inquiry*, to assist the credit department. Using a 3275 display station, an inquiry can be made of the customer's records stored on a file, either at the store controller or at the host processor, and a reply is displayed on the screen. Information on the inquiry function is in this chapter and in Chapters 2 and 4.

**Floor Limit:** Floor limit checking is done when the balance is due. The floor limit is established by the user during system definition and is loaded into the store controller. If the balance due for a sales transaction exceeds the floor limit, action defined by the user during system definition is taken. Floor limits may also be varied from a 3653 terminal or a 3275-3 display station by the data maintenance and change options functions. Floor limits are established for each credit plan.

**Host Positive:** Host positive credit authorization allows a credit check to be made, when the balance is due, by the host processor. This allows each user to tailor credit checking and approval to their own requirements.

For example, an open-to-buy amount and a transaction counter could be maintained for each account number. As each transaction is processed for a given account, the open-to-buy amount could be decreased by the amount of the sale, and the transaction counter could be increased by one. When the open-to-buy amount goes negative or when the transaction counter exceeds a specified limit, status information could be returned to the store controller requiring action, previously defined by the user during system definition, to be taken.

Another feature provided by the host positive credit authorization is establishing a threshold amount that can be used to speed up completion of sales transactions during peak periods of activity such as Christmas. An arbitrary threshold amount can be set by each store for each credit plan and changed by the data maintenance and change options functions during store operation, as required. If a sales transaction does not exceed this amount, host-positive procedures are bypassed.

An additional feature allows a host positive credit message to be printed at the 3653. It permits the user to print a variable-length message of up to 15 characters when the transaction is being totaled. The message may be printed both on the inserted charge document and on the journal roll.

This message print capability may be used in the following applications:

- To enable a meaningful message to be printed, rather than a coded response
- To provide the user with a means of printing "referral reference" numbers (numbers that have predefined meanings for actions to be taken) and/or telephone numbers to be called.
- To enable the user to print special instructions for handling unusual credit authorization situations
- To provide the user with improved audit control by printing credit authorization responses on the journal roll.

**Backup Processing:** Host-positive credit authorization depends upon having each store online with the host processor. If this communications line is momentarily broken, the store must be able to continue operating with other credit authorization procedures. IBM-provided system definition procedures allow a user to combine the credit authorization functions in such a way that five alternatives are available if communication with the host is broken. The following chart illustrates the possible combinations of credit authorization functions. One of these 12 combinations can be selected for each of the four credit plans.

<i>Account Number Entry Processing</i>	<i>Balance Due Entry Processing</i>	<i>Backup Processing</i>
1. Negative		
2. Restrictive		
3.	Floor Limit	
4. Negative	Floor Limit	
5. Restrictive	Floor Limit	
6.	Host Positive	Negative
7.	Host Positive	Restrictive
8.	Host Positive	Floor Limit
9.	Host Positive	Negative
		Floor Limit
10.	Host Positive	Restrictive
		Floor Limit
11. Negative	Host Positive	Floor Limit
12. Restrictive	Host Positive	Floor Limit

**Price Lookup  
(Single and  
Multiple Prices)**

Price lookup is performed for merchandise items that are entered on the keyboard without a price. When the price lookup message is received at the store controller, the price of the item is searched for in the price lookup file by checking the department, class, and stock number field of the message. The price of the item is sent to the terminal, where it is automatically extended, eliminating a keying operation for the salesperson. The price may be a unit price or a price per quantity such as 3/\$1.00. If a price per quantity is used, the terminal automatically extends the correct cost for the number of items purchased. The price lookup file is built by the user, during system definition, and then loaded into the store controller. A different price can be supported for each store. Up to 25 stores (one local store loop plus 12 stores, on each of two multipoint store loops) can be supported.

With the Wand Reader special feature installed, a price lookup can be performed at the store controller on merchandise information wanded from item tickets. Four conditions cause price lookup on wanded entries:

1. The price field length is zero on the ticket format.
2. The price field contains all zeros.
3. The amount field is not entered on a modify-ticket operation prior to pressing the ENTER key.
4. The automatic price override function has been selected.

### **Point of Sale Totals Checkpoint**

At the end of each transaction, the point of sale terminal transmits its current checkpoint totals record to the store controller, where this record is written on the checkpoint totals file. The current checkpoint totals record contains the amounts in the four sales period accumulators that are described under "Sales Transaction", preceding in this chapter. This record also contains the current transaction count. As each checkpoint totals record is received at the store controller, it is written directly over the previous record. In this way, only the most current record is maintained.

The checkpoint totals record is used in the initialization process. Sales period accumulators are reset to zero when the administrative support totals readout and reset or final totals readout and reset function is executed.

### ***User-Defined Table of Descriptors***

On the basic terminal, all descriptions, indications, and abbreviations (for example: SUBTOTAL, TAX, MDS) that print at the three print stations are retrieved from an IBM-provided table in the terminal. This table of descriptors is loaded into the terminal as part of initialization data.

This function allows the store to define its own table of descriptions, indications, and abbreviations for the terminals to be used instead of the IBM-provided table.

Refer to Figure 3-8 for a list of changeable descriptors.

Function	IBM- Provided Default (USA)	Maximum Length
Subtotal	SUBTOTAL	21
Payment	PAYMENT	21
Deposit	DEPOSIT	21
Data Entry	DATA	6
Tax	TAX	3
Original Salesperson	ID	13
Void	VOID	21
Fee	FEE	3
Fee Nontaxable	FEE N	5
Change	CHANGE	21
Amount Tendered	AMOUNT TENDERED	21
Cash Total + (tt=1)	TOTAL	21
Cash Total (Take with Document) (tt=2)	TOTAL	21
Cash Total + (tt=3)	TOTAL	21
COD Total + (tt=4)	COD BAL DUE	21
Layaway Total + (tt=5)	LAYAWAY	21
Charge A Total + (tt=6)	CHARGE	21
Charge B Total + (tt=7)	CHARGE	21
Charge C Total + (tt=8)	CHARGE	21
Charge D Total + (tt=9)	CHARGE	21
Cash Total - (tt=1)	REFUND	21
Cash Total (Take with Document) (tt=2)	TOTAL	21
Cash Total - (tt=3)	REFUND	21
COD Total - (tt=4)	COD REFUND	21
Layaway Total - (tt=5)	LAYAWAY	21
Charge A Total - (tt=6)	CREDIT	21
Charge B Total - (tt=7)	CREDIT	21
Charge C Total - (tt=8)	CREDIT	21
Charge D Total - (tt=9)	CREDIT	21
Logged Transaction	XXXL	4
Offline	XXX	3
Merchandise	MDS	3
Miscellaneous	MIS	3
Tax	TAX	3
Minus	-	1
Void	V	1
Return	R	1
Void-Return	Q	1
Discount	DIS	3
Allowance	ALW	3

*Legend:*

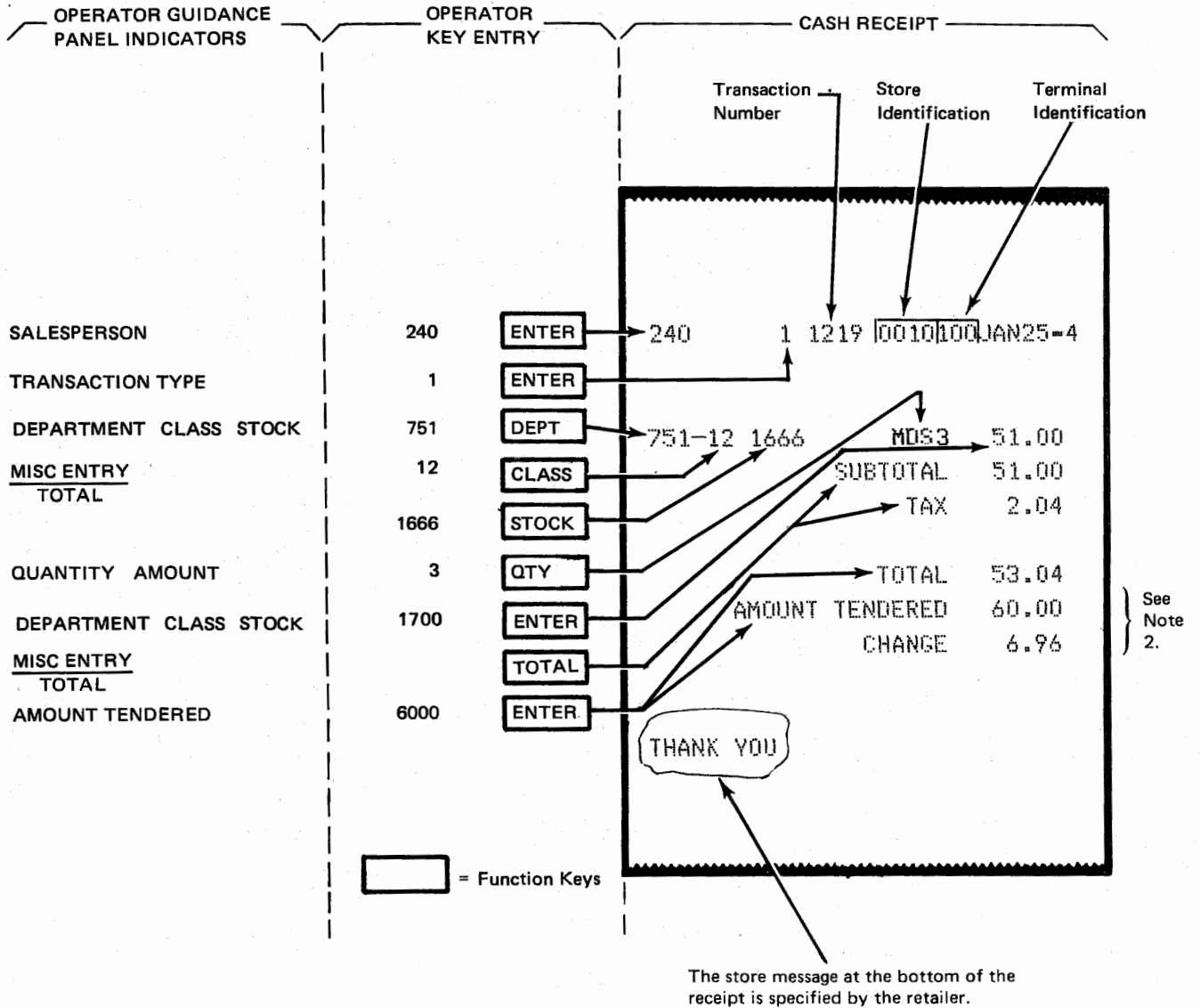
tt            transaction type  
 XXXL        defined by system user

Note: All USA default values are subject to change.

Figure 3-8. List of Changeable Descriptors

## Performing Sales Support Functions

The example in Figure 3-9 shows the sequence of operations that the salesperson uses for a cash sales transaction. The left-hand column indicates the operator guidance panel indicator that is on before each entry, shown in the center column, is keyed. The SALESPERSON indicator is always the first indicator to come on, after the terminal initialization operation. The blocks to the right of the key entry numbers represent the names of keys on the keyboard.



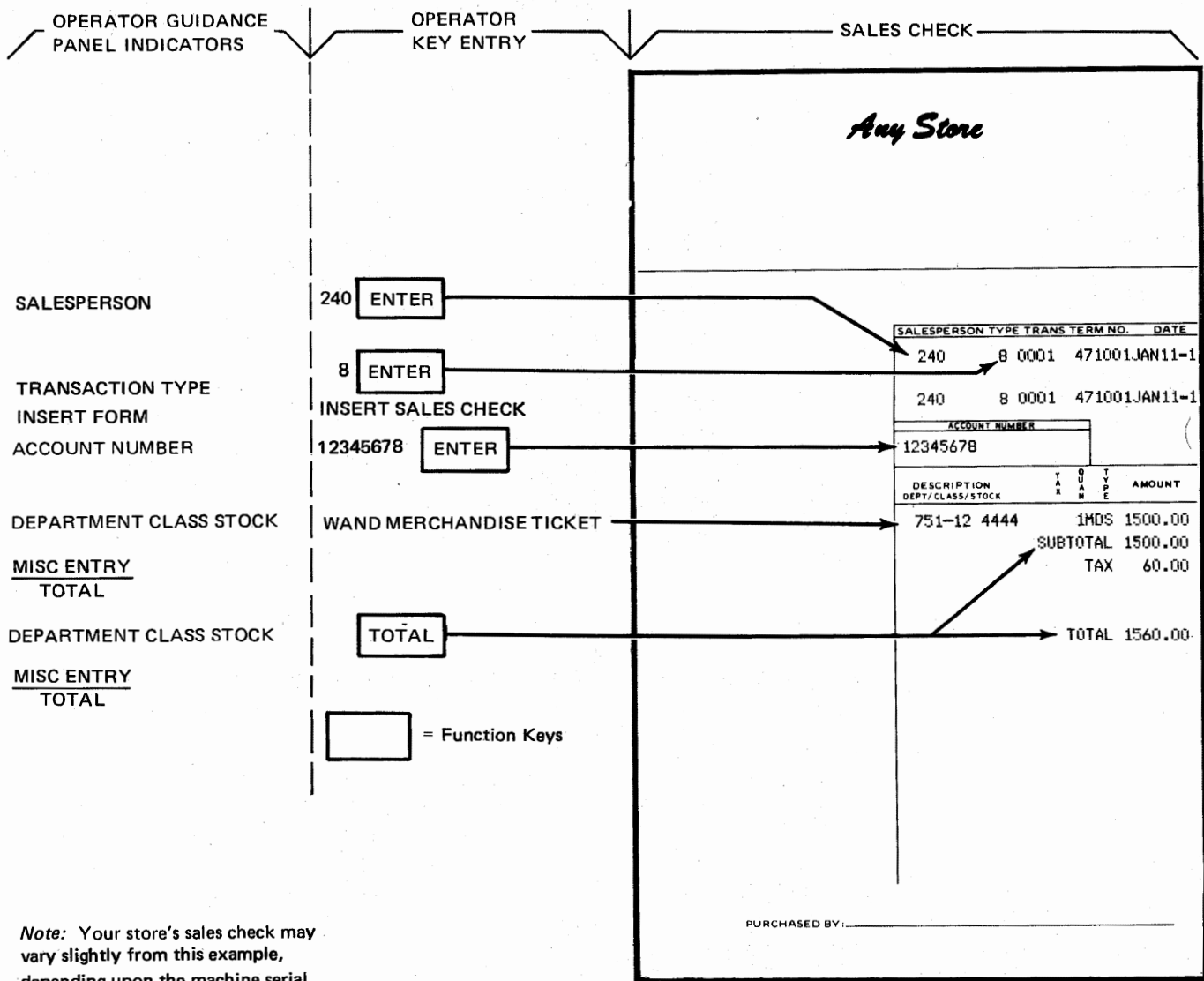
### Notes:

1. Your store's cash receipt may vary slightly from this example depending on the machine serial number and selected functions. See "Selectable Functions" later in this chapter.
2. To reduce transaction time and to save printing space, the store may choose to bypass the printing of AMOUNT TENDERED and CHANGE on the cash receipt. If the store uses the selectable function of entering and recording cash-like tender, the printing of AMOUNT TENDERED should not be bypassed.

Figure 3-9. Cash Sale Example

The example in Figure 3-10 shows the sequence of operations that the salesperson uses for a charge sales transaction. The left-hand column indicates the operator guidance panel indicator that is on before each entry shown in the center column is keyed. The SALESPERSON indicator is always the first indicator to come on after the terminal initialization operation. The blocks to the right of the key entry numbers represent the names of keys on the keyboard.

This example illustrates the use of the operational Wand Reader feature (special feature). One pass of the wand reader eliminates the need to key in the department, class, stock, and amount. Using the wand reader results in the entering of more accurate data and also speeds up the sales transaction.



Note: Your store's sales check may vary slightly from this example, depending upon the machine serial number and the selected functions. See "Selectable Functions", later in this chapter.

Figure 3-10. Charge Sale Example

## Administrative Support Functions

Administrative support functions of the point of sale terminal operate in nonsales mode. Any of these functions in the following list can be restricted to authorized personnel only. Optional security codes can also be assigned by the user to individual employees who require access to restricted administrative support functions.

- Inquiry
- Data maintenance
- Terminal totals readout
- Terminal totals readout and reset
- Final terminal totals readout and reset
- Flash item sales inquiry
- Department sales totals inquiry
- Loan/withdrawal
- Void previous transaction
- Host conversational
- Operator training
- System status and reset
- Cash count
- Change options
- Reentry of 3653 offline transactions
- Void previous transaction by line item
- Program initiation from the 3653 terminal

### Inquiry

Inquiries into the store controller files can be initiated at the point of sale when the terminal is operating in nonsales mode. Responses to these inquiries are printed in a predefined format. Files related to the sales function and created by the user are negative credit, restrictive credit, price lookup, and flash item sales. For further information on this function, refer to "Directing Inquiries", in Chapter 2.

### Data Maintenance

Store controller files can be updated by the point of sale terminal, using the data maintenance function. Data maintenance includes the following commands:

<i>Command</i>	<i>Action Taken</i>
Add	Permits the user to add new records. The appropriate file is updated, and the new record is made available for inquiry and data maintenance.
Change	Permits the user to alter an existing record. The old record is printed, and the user enters data for the fields to be changed. The appropriate file is updated, and the new record is made available for inquiry and data maintenance.
Delete	Permits the user to delete existing records. The old record is printed. If authorization to delete the record is received, the appropriate file is updated. Once a record is deleted, it is unavailable for further inquiry or data maintenance.

Any data file available for maintenance or inquiry can be restricted to authorized personnel only. The operator identification is checked against an authorization file supplied by the user.



### **Terminal Totals Readout**

At any time during a sales period, the four totals in the checkpoint totals record for a specific point of sale terminal can be printed, if the terminal is in nonsales mode. The totals printed are gross plus, gross minus, net cash, and net noncash or sales plus, sales minus, net cash, and net non cash if the Sales Period Total Option is selected. (See "Sales Support Functions", preceding in this chapter for a discussion on gross plus and minus and Sale Period Totals Option for a discussion on sales plus and minus.)

### **Terminal Totals Readout and Reset**

At the end of a sales period, the checkpoint totals record for a specific terminal can be printed. The checkpoint totals record is then added to the balancing totals record and stored in the transaction log. The totals in the terminal are reset to zero, and the checkpoint totals record is reset to zero.

### **Final Terminal Totals Readout and Reset**

At the end of a sales day or when the terminal will not be needed for a period of time, the checkpoint totals record for a specific terminal can be printed. The checkpoint totals record is then added to the balancing totals record and stored in the transaction log. The totals in the terminal are reset to zero. In addition to printing the four totals, the terminal prints FINAL TOTALS RESET and a four-digit security code. The four-digit security code is used during the next sign-on procedure.

### **Flash Item Sales**

The user can create a flash item file containing the department number, class number, stock number, and quantity for advertised or special promotional items. When an item is sold or returned, the flash item sales function updates the quantity of that item and also the amount collected from the sale of that item. Using the inquiry function of the store controller, the user can monitor the sales activity of these flash items by making the proper request at the terminal.

### **Department Sales Totals**

Totals are maintained for the sales period and are accumulated by department and store. The amount of each line item is used to update its dollar department total and store total. The department totals can be used by the store management as an indicator of sales.

The department totals file is on the store controller disk, and each record of the file contains the store number, department number, and gross dollar sales. As line item messages are received, the description code is analyzed. The description code analysis determines if the amount contained in the line item message is to be used to alter the department totals. A sale entry or a return entry that has been voided is added to the department totals, while a return entry or a voided entry other than a voided return entry is subtracted from the department totals.

The department number; which is contained in the department, class, and stock number field of the line item message or embedded in the SKU; plus the store number is used as the key in locating the department totals record in the file.

### **Loan/Withdrawal**

At the beginning of a sales period, or at any time during that period, it may be necessary to put more cash in the cash drawer.

After a loan request has been entered, the amount entered is printed on the transaction journal and the cash receipt station tapes. The amount entered is added to the loan accumulator in the balancing totals record for this point of sale terminal.

The withdrawal function is identical to the load function, with the following exceptions. When tender is withdrawn from the cash drawer, the amount of this withdrawal is added to the withdrawal accumulator in the balancing total record for this point of sale terminal.

### **Void Previous Transaction**

A previous transaction can be voided by entering the information necessary to identify a previous transaction. The terminal must be in nonsales mode. This entry is logged only, and no sales period totals are adjusted. Only transactions that have taken place during the current sales period should be so voided, because these voids are applied against the current transaction log and current totals during user processing. Transactions made outside the current sales period should be treated as returns.

### **Void Previous Transaction by Line Item**

This procedure allows you to void (cancel) a transaction by line item, that has been previously entered into the system during the same day's sales period. This procedure must be done at the same terminal where the transaction was entered. Unlike "Void Previous Transaction" this function updates the appropriate sales files (Department Totals, Store Totals, and Flash Item Totals).

### **Host Conversational**

Host conversational is supported in the nonsales mode. It consists of inquiries to, and responses from, the host.

After requesting the use of host conversational at the terminal, the operator may key a maximum of 30 digits, including function keys, before pushing the ENTER key. When the store controller receives this message, it prepares the text for transmission to the host processor. If the host processor is not online, a message indicating this condition is printed at the point of sale terminal.

### **Operator Training**

Operator training is supported by entering nonsales mode and requesting training mode. When the point of sale terminal is in training mode, all sales functions except host positive credit authorization are supported. Cash count is the only nonsales function that is supported in training mode. Any other nonsales function attempted in training mode is automatically terminated. Operation of the terminal in training mode is identical to that of sales mode except that no transactions are logged, and no totals are updated in the store controller. Entry to, and exit from, operator training is logged in the transaction log.

### **System Status and Reset**

System status can be determined by using the status function. The system status is printed on the cash receipt station of the inquiring 3653 terminal.

The reset function (under control of the store controller) is used to reset terminals that may have been active during the sales period but that were unable to perform a final totals readout and reset function or terminate in a normal manner. Store procedures should be provided to 3653 operators to instruct them and to ensure that terminals are reset before the next sales period.

## Cash Count

Cash count is a nonsales function that assists the store with the register closing procedure when the operator counts coins, currency, and cash-like tender in the till. The 3653 terminal is used as a calculator, line printer, and data logger. Each denomination of coin and currency from pennies to \$1000 bills is assigned an identification (ID) number and a descriptor in the system. The user can assign ID numbers and descriptors for up to 14 types of cash-like tender such as checks, gift certificates, coupons, etc.

The number of nonsales sessions may be limited by subsystem definition, in Release 3.2. For example, if a store is experiencing a large number of 3653 terminals going offline when store closing procedures are performed, a limit may be specified and "fine-tuned", to permit scheduled store closings, without the offline problem. Terminals in excess of the limit attempting the function get a message requesting the operator to wait and try again. Refer to the *Programmer's Guide* and the *Subsystem Definition Guide* for details.

The cash count function has also been enhanced to allow multiple terminals, signed-on for cash count, to share the same system resources. System resources are allocated when the first cash count session is started; they are released when the last cash count session terminates. Hence more terminals may perform the cash count function concurrently and with faster response using fewer system resources.

The operator enters the terminal address and last transaction number or simply presses the ENTER key, if the terminal session is to be continued. Then the operator enters the ID representing the coin or currency and the quantity counted. The terminal prints the quantity, the description, and the dollars and cents amount on the transaction journal and on the cash receipt. A record of the cash count operation is logged on the transaction file for later comparison of tender and sales.

A grand total list showing entries and sub-totals of entries, or only sub-totals of entries, completes the cash count function.

Two command codes are available with the cash count function. Command 26 prints the current ID and denomination list before entering the collection process. Command 27 enters into the collection process immediately without printing the ID and denomination list (also called the currency list). Either command code causes the cash drawer to open. Refer to Figure 3-11 for a sample cash receipt printout.

## Change Options

The change options function allows the operator to update certain store controller and point of sale terminal functions that were specified during subsystem definition. The operator can turn off certain functions or turn them on again (if they were previously turned off by this function), by using the change options function. Values such as the credit floor limit and the credit host threshold can also be modified.

### **Reentry of 3653 Offline Transactions**

This function allows you to reenter sales transactions that took place while the 3653 Point of Sales Terminal was operating offline from the store controller. The journal roll may be used as the source document for the data to be reentered. This function also allows transactions completed offline at one 3653 to be reentered at another 3653.

Data written into the transaction log is identified as reentered data, so that the user processing program can process the data accordingly. Receipts printed at the 3653 are identified as reentry transactions, "REENTRY OFFLINE TRANSACTIONS" is printed at the start of reentry, and "EXIT REENTRY" is printed, along with the totals, at the completion of reentry. This allows the user to identify reentered data on the journal roll. See the *IBM 3650 Retail Store System Administrative Operations Guide* for operating procedures and restrictions.

### **Program Initiation From the 3653 Terminal**

This feature allows the IBM 3653 Point of Sale Terminal to operate under the direct control of user programs. See the *IBM 3650 Retail Store System Administrative Operations Guide* for operating procedures.

### ***Performing Administrative Support Functions***

Administrative support functions are executed in nonsales mode. The terminal is placed in nonsales mode when the operator presses the ENTER key whenever the TRANSACTION TYPE light is on at the operator guidance panel. After the ENTER key has been pressed, a message is printed on the journal tape requesting the type of function desired. The operator then follows the procedures determined by the store for performing a specific administrative support function such as inquiry or host conversation.

4321 A 0018 471101 JAN3076

R001 ENTER COMMAND

27N

CASH COUNT - NO CURRENCY LIST

R144 ENTER TERM ADDR-TRANS NUM

N

R172 ENTER ID-DESCR

QTY	DESCR	AMOUNT
00P12GN		
012	PENNIES	.12
02P14GN		
014	DIMES	1.40
10P14GN		
014	DOLLARS	14.00
12P13GN		
013	FIVES	65.00
25P2G2500N		
002	CHECK	50.00

M2N

I179 GRAND TOTAL SUMMARY

QTY	DESCR	AMOUNT
12	PENNIES	.12
14	DIMES	1.40
26	SUB-T	1.52
14	DOLLARS	14.00
13	FIVES	65.00
27	SUB-T	79.00
2	CHECK	50.00
2	SUB-T	50.00
55	GR-TOT	130.52

T141 CASH COUNT COMPLETE

Figure 3-11. Example of Cash Receipt for the Cash Count Function

## Selectable Functions

Selectable functions for the point of sale terminal provide increased transaction flexibility for traditional retailers and mass merchandisers. Some of the selectable functions can be added to certain basic 3653 Point of Sale Terminals; others require the Functional Expansion special feature to be installed. Your IBM sales representative will help you make the proper selections. The selectable functions the user desires are incorporated into his system at subsystem definition.

### 1. Automatic Tax Calculation

This selectable function provides automatic tax calculation of the sales tax at the end of a sales transaction. Without this selectable function, the salesperson must calculate and enter the tax to complete a sales transaction.

### 2. Option to Frank Cash-Like Tender

With this function, the store has the option of requiring the salesperson to frank (endorse) or cancel tender such as bank checks, gift certificates, store or manufacturer coupons, due bills, script, etc. by inserting such tender in the document insert station. The salesperson is prompted to insert the tender by the INSERT FORM-CLEAR guidance indicator. When the CLEAR key is pressed, the terminal prints the transaction header line and the account number/amount line -- data that was entered when the AMOUNT TENDERED guidance indicator was on.

This franking function ensures that all cash-like tender submitted by customer is properly authorized, endorsed, or canceled, depending upon the type of tender.

The Entering and Recording Multiple Cash-Like Tender (3) or the Check Authorization (21) is a prerequisite for this selectable function.

### 3. Entering and Recording Multiple Cash-Like Tender

With this function selected, the salesperson can enter and record up to six types of cash-like tender, such as gift certificates, coupons, credit, checks, etc. (Checks are included only if the Check Authorization (21) selectable function is not selected.) This selectable function also allows entry of an amount less than the calculated amount due. In this case, the terminal reduces the amount due by the amount tendered and displays a new amount due.

Cash entries are handled the same way as on the basic terminal. Cash-like tender entries are handled by keying-in an identifying digit, from 0 to 5, followed by the diagonal (/) key and the cash-equivalent amount of the tender. If the option to frank cash-like tender function is also selected, the INSERT FORM-CLEAR guidance indicator comes on, and the tender can be franked.

The user has the option to prohibit the printing of the amount tendered.

### 4. Printing Multiple Send Labels

This selectable function allows the printing of up to three send labels, on a send transaction. The labels are attached to the bottom of the sales check form. (The operator must identify the send transaction before the labels are printed.) The store can specify three parameters for send labels with this option:

1. Number of send labels (1 of 3) to be printed. (The total line is omitted from the first send label so that it can be used as a gift send label.)
2. Number of line spaces after the total line on the detail portion of the sales check (before the first send label header line).
3. Number of line spaces between header lines on the send labels.

Before the send labels are printed, the INSERT FORM—CLEAR guidance indicator comes on, to allow the salesperson to position the form to an alignment mark for proper printing and spacing on the send labels.

Refer to Figure 3-12 for an example of multiple send labels.

#### **5. Wanding and Printing the Name from a Credit Card**

This selectable function allows a magnetic wand to read up to 15 additional name characters from a card and to print these characters on the account number line (see Figure 2-13) of the charge sales check.

#### **6. Continuation of Sales Check**

This selectable function allows the continuation of the recording of a sale, on more than one sales check. When a sale involving a sales check has more line items than can be printed on one form, the terminal senses this limit, prints a subtotal line, and ejects the form. The salesperson inserts a new form and the terminal prints a header line on the new form and the account number line, if it is a charge sale. The subtotal line prints again on the first detail line of the new form. This process is repeated again, if necessary, until the sale is completed.

The store can specify the line count for each transaction and a line count for all send transactions. The line count specifies the number of lines that can be printed in the detail (merchandise line item) portion of the sales check.

#### **7. Multiple Tax Tables**

This selectable function allows a person to select a tax code from up to 92 tax tables in the store controller, in addition to the tax table available in the terminal for automatic calculation. The store controller accepts a valid tax code entered by the salesperson, calculates the amount of the tax, and returns the tax amount with a tax description, to the requesting terminal. The tax description and the calculated tax are printed on the same line of the cash receipt.

#### **8. Charging the Balance Due on a Cash Transaction**

After the start of a cash sale, a customer may request the use of some form of credit to complete the transaction. This function allows the salesperson to change from a cash sale to a charge sale when the AMOUNT TENDERED guidance indicator is on. The salesperson enters the type of charge plan and the account number, then the INSERT FORM—CLEAR guidance indicator comes on. After the appropriate sales check is inserted and the CLEAR key is pressed, the terminal prints the transaction header line, the account number line, and the amount being charged on the sales check.

#### **9. Cash Drawer Option**

This selectable function, as specified at subsystem definition (either by specifying the transaction type or option), allows the cash drawer to operate in any of the following ways:

- Opens normally and must be closed
- Open normally and may remain open
- Remain closed
- Open for all sales transactions and must be closed
- Open for all sales transactions and may remain open.

# Any Store

"S" for Send Identification  
(The user may choose a different character.)

Name from Credit Card

Automatic Price Override

Your store may choose descriptors different from these shown here.

Gift Send Label

Charge Send Label

Additional Customer Receipt

SALESPERSON	TYPE	TRANS	TERM NO.	DATE
323	S4	0038	1-14.0	OCT 8-4

ACCOUNT NUMBER
004133

DESCRIPTION DEPT/CLASS/STOCK	T A X	T Y P E	Q U A N	AMOUNT
33341143		MDS 1		2.00 ↓
		SUBTOTAL		2.00
		TAX		.09
		COD BAL DUE		2.09

PURCHASED BY: \_\_\_\_\_

Figure 3-12. Example of Multiple Send Labels and Other Functions



#### **10. Enforcing Entry of Salesperson Identification**

This makes it mandatory that salesperson identification be entered in response to the SALESPERSON guidance panel indicator. The data may be keyed or wanded. Failure to enter data causes a tone to be emitted and the CLEAR-RE-ENTER guidance indicator to come on.

#### **11. Unique Return Transaction**

This allows the salesperson to press the RETURN key after a transaction digit, when the 3653 is in type transaction state. For the remainder of the transaction, all entries where a RETURN key is presently allowed are automatically coded and handled as if the RETURN key had been pressed during that entry.

#### **12. Halfpenny Support (United Kingdom Only)**

This selectable function applies to World Trade users in the United Kingdom only. (See Appendix F.)

#### **13. Bypass Credit Authorization (Offline)**

This selectable function allows the 3653 operator to make credit and charge-entries without having to wand or key-enter an authorization code, when the terminal is offline.

#### **14. Automatic Total at End of Sales Check**

This selectable function allows the user to specify the number of lines that can print in the body portion of the sales check. When the line count is exceeded, a total sequence and sales check ejection is forced, just as if the TOTAL key were pressed. This function would be used when the store wishes to limit a transaction to a single sales check. If there are additional transactions required in the sale, the user must use a new sales check and treat these items as a new transaction.

#### **15. Displaying Minus Sign for Returns**

This selectable function causes the minus sign (-) to be illuminated on the transaction display when the RETURN key is pressed, indicating that a refund is in progress. The minus sign is displayed whenever a function key is pressed during the line item entry. At the end of the line item entry, the sign of the entire line item is determined.

#### **16. Voiding a Previous Transaction (Offline)**

At times it may be required to void a previous transaction, when the 3653 is offline. This selectable function simulates that ability and also keeps a record of the transaction on an inserted form for later entry when the store controller is online or for manual audit of the form. See the *IBM 3650 Retail Store System Administrative Operations Guide* for the operating procedure of this selectable function.

#### **17. Line Item Discount**

This selectable function provides the user with the capability of discounting individual line items without regard to a discount for the entire transaction. The function also provides the user with a method of specifying the maximum line-item discount. This discount can be no larger than 63 percent of the item's price. Entry of a discount percentage larger than the specified maximum causes a tone to sound, the entry is rejected by the terminal. If the discount percentage is omitted from the key sequence, the maximum discount percentage specified is applied as a default percentage.

This function permits multiple discounts within a transaction and allows line items not subject to discounts to be listed in the same transaction as items that can be discounted. Line-item discounts cannot be taken on an allowance, a payment, or a tax. For each line item discounted the discount descriptor, discount code, percentage, and amount is printed. A calculated discount amount greater than \$838.86 causes the transaction to be voided. The VOID and RETURN keys may not be used when a line-item discount is entered.

#### **18. Maximum Transaction Discount**

This selectable function allows the user to specify a maximum transaction discount of up to 63 percent to be applied at any 3653. The specified percentage is applied as a default amount when no discount percentage is entered. If a larger percentage is entered than the fixed maximum percentage, a tone sounds, and the entry is rejected by the terminal.

Only one transaction discount may be taken per transaction, and no transaction discount is allowed if a manual tax or a payment has been entered, or if automatic tax or tax lookup is used. Both taxable-sales and balance-due accumulators are discounted unless the NONTAX key is pressed, in which case only the balance-due accumulators are discounted. Any calculated discount amount greater than \$838.86 causes the transaction to be voided.

#### **19. Sales Period Totals Option**

This selectable function provides the user with the option to inhibit the accumulation of payments and deposits in the gross minus total and to inhibit the accumulation of return of deposits and payments with the gross-plus totals. The other aspects of the Sales Period Totals Option are the same as mentioned previously under "Sales Transaction".

Gross plus and gross minus, as defined under "Sales Transaction." are not available when this selectable function is present in the 3653.

#### **20. Control Over Voiding a Preceding Item**

With this selectable function, the user has the option to permit or prevent the entering of line-item data when voiding a previous line item in a transaction. With this option, a void-enter sequence is valid for the immediately preceding line, and the void-data-enter sequence is not allowed. If this selectable function is not present, or if the option is not chosen, both void-enter and void-data-enter sequences are as defined for normal operation and are not mutually exclusive.

#### **21. Check Authorization**

For checks tendered instead of cash, this function provides for approval against a check authorization file similar to the credit authorization function. The check authorization file can be either a negative or a restrictive file in the store controller or a host-positive file in the host processor. The store can also establish a floor limit on checks so that only checks above a specified amount require additional authorization by the system. The main difference between a check and a credit authorization is that refusal of a check does not automatically void the transaction. The terminal provides positive indication when a check is refused.

Franking (endorsing) a check is also a selectable function. Refer to "Option to Frank Cash-Like Tender," preceding in this chapter.

## **22. Multiple Pricing with Price Lookup (Release 3.0 Only)**

This selectable function provides the user with the capability of having a multiple price provided, rather than a unit price, for a line item when price lookup is performed. The user may mix terminals with or without this function, on the same store loop.

## **23. Wanding and Offline Checking of Authorization Code**

This selectable function allows wanding of the authorization code, if it is correctly encoded and placed on an authorization card or some other media. This function also makes it possible to check an authorization code when the 3653 is offline. The offline checking of the authorization code is made by comparing the wanded or keyed authorization code to a four-digit constant stored in the 3653. This constant is stored in the 3653 when it is initialized. If the authorization code entered is not the same as the stored constant, a tone sounds and the entry is rejected by the terminal.

## **24. Minimum Fees for COD, Layaway, and Send Transactions**

Basic fee collection functions of the terminal are the enforcement (by a prompt to the salesperson) of a minimum fee entry on COD and layaway transactions and optional enforcement of a fee entry on send transactions.

This selectable function allows the store to enforce the entry of a user-specified minimum amount for fees on COD, layaway, and send transactions. The specific minimum can be different for each of the transaction types.

If the fee amount entered is less than the specified minimum, the entry is rejected by the terminal.

## **25. Department/Class Validation, Description Lookup, and Sequence Control**

These three options are available in any combination, if this selectable function is selected during system definition.

### **Department/Class Validation**

When the salesperson enters a department number or a dept/class number, the terminal sends a request to the store controller to check whether the number is valid. If the number is invalid, the entry is rejected at the terminal. If the number is valid, the store controller checks whether the description lookup option has been specified. An alphanumeric descriptor can be printed on the sales receipt instead of the department/class/sales number, if desired (Figure 3-13).

### **Description Lookup**

If the description lookup option has been specified, the store controller retrieves an 18-character description of the line item from the file and sends it to the terminal. The user can specify the 18-character description and may choose to include (within the 18 characters) the department or dept/class number that was entered.

### **Sequence Control**

If the sequence control option has been specified, the store may require or prevent the entry of a stock number, depending upon the department or dept/class number previously entered.

## **26. Decimal Quantity (World Trade Countries Only)**

This selectable function applies to World Trade users only. (See Appendix F.)

## **27. Value Added Tax (World Trade Countries Only)**

This selectable function applies to World Trade users only. (See Appendix F.)

### 28. Bypassing Entry of Stock Number

This selectable function provides the user with the option of bypassing the entry of the stock number of a line item without affecting the entry of the department or class numbers. The function is selected at subsystem definition and applies only to those 3653 Point of Sale Terminals selected by the user. With this option selected, the 3653 skips to the quantity/amount state following a department and/or class entry.

### 29. Wanding Price Change Tickets

This selectable function allows the use of an additional "price-only" ticket. When a price change ticket is attached to merchandise, the salesperson wands (magnetic wand only) the price change ticket first. Then, when the regular ticket is wanded for merchandise information, the terminal ignores the regular price.

```
4          1 0011 471071 JAN1171

LEISURE JACKET      1   133.00
MENS ACCESSORIES    3    3.75
MENS ACCESSORIES    1    5.95
                   SUBTOTAL 142.70
                   TAX      8.00
AMOUNT TENDERED    160.00
                   CHANGE   9.30

                   TOTAL   150.70

THANK YOU FOR YOUR PATRONAGE
```

Figure 3-13. Alphanumeric Department/Class Validation Descriptors

### 30. Wanding in Nonsales Mode

This selectable function is an administrative support function rather than a sales function, and it allows the operator to sign on in nonsales mode and use the wand to enter merchandise information from tickets. The terminal formats the wanded information into a data entry message and sends it to the store controller. The store controller prepares a record for the wanded data entry and logs it in the transaction log file.

Possible uses for this function are:

- Entry of inventory information from one part of a multipart ticket
- Wanding merchandise transfers from another store
- Wanding receipts into a department
- Reentry of merchandise information from tickets collected while the terminal was offline.

### 31. Fractional Quantity (USA Only)

This function gives the 3653 the ability to accept and to process fractional quantities during the sales mode of operation. The salesperson can enter fractional quantities such as  $1/8$ ,  $1/4$ ,  $2/5$ ,  $3/4$ , or  $14/15$ . This function also allows the user to multiply fractional quantities times the unit price. In addition, it can be used to print, transmit, perform mathematical operations, and log fractional quantities.

The Fractional Quantity (FRACT QTY) key replaces the blank key on the 3653 (this key is the  $1/2$  key used only in the United Kingdom), if this is specified when the terminal is ordered. This key is used by the salesperson during the "quantity-amount guidance state", to enter fractional quantities. For example:  $5 \frac{1}{4}$  would be entered as (5) FRACT QTY (14) QTY.

The digit(s) keyed before the FRACT QTY key is pressed represent the *whole number* parts of the quantity. The digits (up to four) keyed after the FRACT QTY key (but before the QTY key is pressed) represent the *fractional* part of the quantity.

The numerator is entered before the denominator, and either may be one or two digits. The numerator has a range of from 1 to 15, and the denominator has a range of from 2 to 16. The denominator must always be larger than the numerator.

### 32. Positive Feedback from Wanding

The selectable function provides the user with a method to receive a positive feedback in the form of two short tones when data has been successfully wanded with the Magnetic Wand Reader feature. With this function selected, no tone sounds if an error is detected during the magnetic wanding. A single tone sounds for other types of errors, such as no price found on price lookup, even when connected with wanded items, and the CLEAR-RE-ENTER light turns on until the CLEAR key is pressed.

*Note 1:* It is possible that the positive double tone may be followed by a single error tone, with the CLEAR-RE-ENTER light on. This indicates that the wanding operation was successful but that the data read by the wand caused an error.

*Note 2:* This selectable function provides a double-tone, positive feedback indication when it is used with either the OEM EAN/UPC Wand Attachment (RPQ 858921) or the OEM UPC Wand Attachment (RPQ 858983). Otherwise, the wand attachment provides a single-tone, positive feedback indication.

### **33. NO-SALE Key Control**

This selectable function makes it possible for the user to select one of three options to operate with the NO SALE key. These options are:

1. No control
2. Control of the NO SALE key by using a security code
3. Prohibition of the use of the NO SALE key.

If use of the NO SALE key is controlled with a security code, the function is performed in the same manner as for negative entries.

### **34. Deposit Limit on COD and Layaway Transactions**

This selectable function provides the user with a method of rejecting deposit entries that are greater than the balance due on COD and layaway transactions (transaction types 4 and 5). The terminal rejects any keying sequence that is in error. The user must then reenter the data.

### **35. Rounding of Totals (World Trade Countries Only)**

This selectable function applies to World Trade users only. (See Appendix F.)

### **36. Controlling Operations by Transaction Type**

This selectable function permits or prevents certain operations within a transaction type. Specific bit positions of the control bytes are set to one or zero to indicate whether the transaction type and operation is allowed or prevented. The control bytes are loaded into the 3653 when it is initialized. Attempted use of voids, payments, returns, discounts, and allowances causes a tone to be sounded and the CLEAR-RE-ENTER guidance sequence to be displayed if such entries are not accepted. Fees and deposits are controlled by entering or by not entering the fee or deposit.

### **37. No Tax on Fees**

This selectable function allows you to specify whether or not a tax calculation is to be made on layaway, COD, or send fees entered at the 3653 terminal.

### **38. Offline Check Authorization by Floor Limit**

This selectable function allows the user to specify, to the 3653 terminals, a floor limit value for offline check authorization. This limit is used whenever the 3653 is operated offline. Transactions in which the amount tendered exceeds the floor limit value require entering an offline authorization code to complete the transaction. The Check Authorization (21) selectable function is a prerequisite to this selectable function. This selectable function requires a 3653 at the most current EC level at the time of Release 3.1 shipment.

### **39. Offline Credit Authorization by Floor Limit**

This selectable function allows the user to specify, to the 3653 terminals, a floor limit value for offline credit authorization. This limit is used whenever the 3653 is operated offline. Transactions in which the amount charged exceeds the floor limit value require entering an offline authorization code to complete the transaction. This selectable function requires a 3653 at the most current EC level at the time of Release 3.1 shipment.

#### **40. Cashier Mode**

This selectable function allows an alternate sign-on/off procedure and an alternate procedure for maintaining totals, suitable for a checkout environment. Entry of the salesperson number is required only at sign-on time.

When an operator signs on, the 3653 assumes that the same operator operates the terminal until sign-off. At sign-on, the operator's number is checked for validity by the system, and a salesperson record is initiated.

This selectable function is suited for front-end operations where the operator may work at several different terminals during a day, and the totals in the store controller are balanced against the contents of the till at the end of the day. The totals are balanced by operator rather than by terminal.

#### **41. Quantity Keyed First**

This selectable function allows an operator to enter the quantity of like items being purchased, before entering department, class, or stock information. It can be used with the Item Lookup Keying (46) and Department Keys (42) selectable functions to reduce the number of keystrokes for the most frequent entries. This selectable function should not be combined with Fractional Quantity (31), or the OEM OCR Wand Attachment feature.

#### **42. Department Keys**

The Modifiable Keyboard function is a prerequisite for this selectable function. With these two, the user can define up to 16 key positions on the Modifiable Keyboards, as department motor keys. A 13-character department number/descriptor can be specified for each department key. This selectable function requires a 3653 at the most current EC level at the time of Release 3.1 shipment.

#### **43. Alternate Cash Transaction Entry**

This selectable function allows the user to indicate a cash transaction at a 3653 terminal by pressing one key rather than two keys.

#### **44. Bypassing Amount Tendered**

This selectable function forces the 3653 to bypass the amount tendered step in a sales transaction. Thus, when the TOTAL key is pressed, the amount tendered is not displayed at the 3653. A tender entry is not required, and the 3653 does not calculate change.

#### **45. Faster Change Making**

This selectable function enables the change due to be displayed and the cash drawer to be opened before (excluding any franking operations) the change and amount tendered are printed.

#### **46. Item Lookup Keying**

This selectable function allows an operator to enter only an item number at a 3653. The system responds with the price of the item from the store controller.

#### **47. Descriptor Lookup**

This selectable function allows the store controller to respond to an item lookup request with both the price and a 1- to 18-character item description and an indication as to whether the item is taxable or nontaxable. This selectable function requires a 3653 at the most current EC level at the time of Release 3.1 shipment.

#### **48. Modifiable Keyboard**

This selectable function is a prerequisite for the Department Keys (42) selectable function.

The modifiable keyboard is a 48-position keyboard with 10 numeric keys and 37 function keys. The 10 numeric keys and the CLEAR key are fixed-position keys and cannot be moved. The remaining 36 function keys may be assigned and/or disabled to support your environment. Up to 16 keys may be designated as department keys. This selectable function requires a 3653 at the most current EC level at the time of Release 3.1 shipment.

#### **49. Check Endorsement.**

This selectable function is an extension of the Option to Frank Cash-Like Tender (2) selectable function and is used with the Entering and Recording Multiple Cash-Like Tender (3) and the Check Authorization (21) selectable functions. It provides a four-line endorsement, and allows the user to specify the contents of two print lines (30 characters per line) to be used in endorsing a check.

This selectable function requires a 3653 at the most current EC level at the time of Release 3.1 shipment.

#### **50. Enforcing Amount Tendered Entry**

This selectable function makes it mandatory to enter the amount tendered. Without this function, if the ENTER key is pressed, without entering the amount tendered, the 3653 assumes that the amount tendered and the amount due are the same.

With this function, a "clear reenter" sequence occurs if the ENTER key is pressed and an amount tendered has not been entered; entry of the amount tendered is then mandatory.

#### **51. Offline Terms Code and Spacing Control**

This selectable function allows the 3653 terminal to prompt for a terms code in offline operation. In online operation, the prompt is from the 3651 Store Controller. The spacing consideration supports the printing of a terms code in the proper place on a sales ticket.

#### **52. 3653 Date Transmission to 7481**

This selectable function provides for the inclusion of a date in the transaction header message that is transmitted from the 3653 to the 7481.

#### **53. Multiple Tax on Fees**

This selectable function provides for using the autotax, manual tax, or multiple tax tables for fee amounts.



**54. OCR Wand Data Entry**

This function can be used only with 3653 terminals having the OCR Wand Attachment feature. This function allows data received from a 3653 in wand data entry mode to be logged on the transaction log, one OCR line per record (the same as for a magnetic wand terminal).

**55. Modified Printing of Cash Receipt**

This selectable function shortens the length of time required to complete printing the cash receipt for transaction types 1 and 2. The store message is printed above the header line. Printing of the amount tendered and the change is suppressed when the change equals zero.

**56. Price Override on Void of a Line Item**

This selectable function forces a price lookup when a line entry is voided. The data can be wanded or key-entered.

Without this function, if a line item is voided, the wanded or keyed price is used and price lookup is not performed.

**57. Print Station Document Advance Control**

With this selectable function, documents inserted at the 3653 print station are advanced with multiple line feeds, after the last line of print.

Multiple line feeds occur when the following conditions are met; (1) the 3653 has the Control by Transaction Type selectable function, (2) the appropriate options are set to allow printing to default to the cash receipt station, and (3) no document is inserted at the print station.

**58. Modify Ticket Indicator**

This selectable function prints an arrow in the "S" position of the "MDS" descriptor (when the descriptor is present), when the wanded item price is changed by the 3653 operator, by using the Modify Ticket key.

This selectable function is not compatible with the Halfpenny Support function (United Kingdom only).

**59. Modified Discount Rounding**

This selectable function allows rounding for transaction and line item discounts. With this function, the fractional portion of the calculated discount is rounded for values equal to or less than one half.

**60. Modified Line Item Data Printing – Option 1**

With Release 3.0 or later and with the Department/Class Validation, Descriptor Lookup, and Sequence Control selectable function, the department descriptor (from the department file) is printed on the transaction journal and the cash receipt or sales check.

With this selectable function and the Department/Class Validation selectable function, the keyed or wanded department/class/stock number is printed on the transaction journal and the cash receipt. The department descriptor (from the lookup) is also printed on the cash receipt or sales check.

### **61. Modified Line Item Data Printing – Option 2**

With Release 3.0 or later and with the Department/Class Validation, Descriptor Lookup, and Sequence Control selectable function, the department descriptor (from the department file) is printed on the transaction journal and cash receipt or sales check.

With this selectable function and the Department/Class Validation selectable function, the keyed or wanded department/class/stock number is printed on the transaction journal, and the department descriptor (from the department file) is printed on the cash receipt or sales check.

### **62. Cashier Mode with Password**

A 3653 terminal operating a 3650 system at EC 349853 is a prerequisite for this selectable function.

This selectable function allows you to specify a four-digit password and require the 3653 terminal operator to sign on, using the assigned four-digit password. For online sign-on, this password is found in the Operator Balance Totals file; and for offline sign-on, the single four-digit authorization code can be defined during subsystem definition.

## **Checkout Environment**

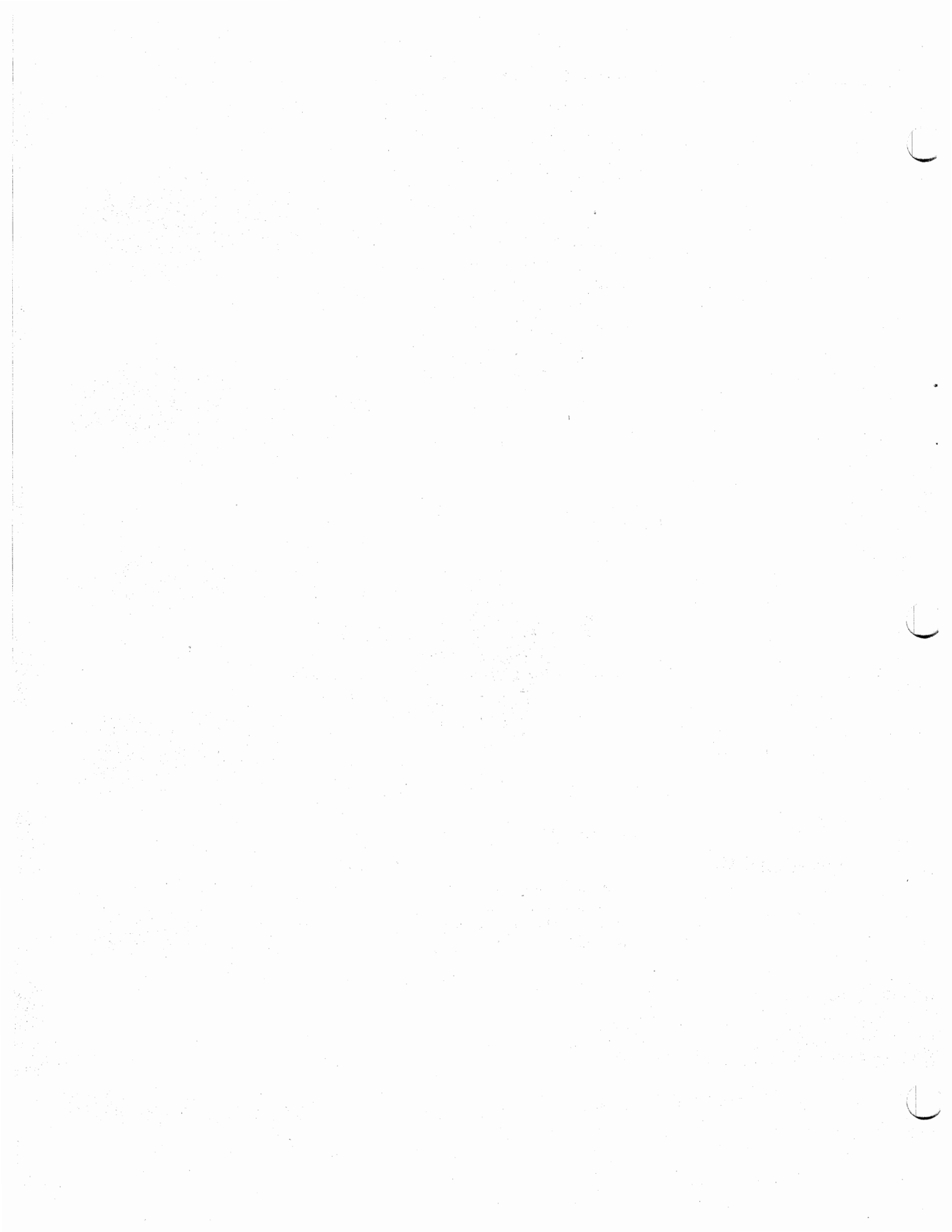
Many of the selectable functions available for the 3653 terminal have a direct application to store environments that have a “checkout” method of operation. While each of these selectable functions is separate and may be selected independently, certain ones are logical choices for the checkout operation. A set of selectable functions for checkout might include, among others:

- Alternate Cash Transaction Entry
- Quantity Keyed First
- Item Lookup Keying
- Descriptor Lookup
- Faster Change Making
- Cashier Mode

In addition, if the 3653 Modifiable Keyboard is included (or ordered), the following selectable functions should be chosen:

- Modifiable Keyboard
- Department Keys

Two of the functions and capabilities that are of particular note in the category applicable to a checkout environment, are Cashier Mode and Department Keys. Cashier Mode makes it possible to maintain sales totals by salesperson, rather than by terminal. This option should be chosen when financial accountability by operator, is desired. Cashier Mode allows the sales totals to follow the salesperson and cash till from terminal to terminal during the sales day. The Department Keys function reduces the number of keystrokes per item and prints a department number/descriptor that is stored in the 3653 terminal.



## Chapter 4. IBM 3767 Model 2 Communication Terminal (Release 3.1 or Later)

The IBM 3767 Model 2 Communication Terminal is a compact, desk-top unit (see Figure 4-1). It is a keyboard/matrix printer capable of bidirectional printing up to 80 characters per second in 132 print positions. The 3767-2 with the 3650 Loop Attachment RPQ 858807 installed can operate on an IBM 3650 Retail Store System store loop. The 3767-2 has 512 bytes of buffer and buffer editing capability, which allows correcting and rearranging of buffer data before transmission.

Through user-written application programs and IBM-provided store controller functions, the 3767-2 with the Loop Attachment RPQ can be used for many applications, in meeting retail store requirements. A few of these applications are:

- Preparing purchase orders
- Automatically generating merchandise tickets
- Accepting and responding to management inquiries
- Maintaining personnel and payroll records
- Accepting credit department input
- Batch printing of reports

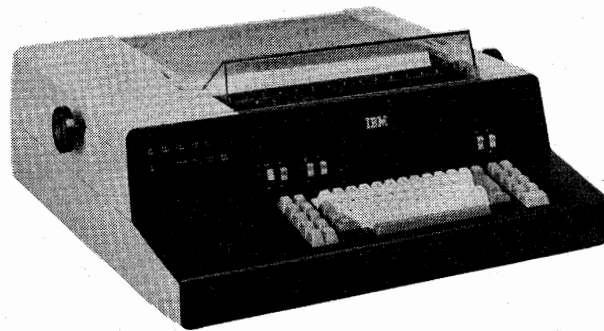


Figure 4-1. IBM 3767 Model 2 Communication Terminal

### Operational Modes

The terminal operates in two basic modes: (1) communicate (online), and (2) local (off-line). In communicate mode, it operates with the retail store loop, under control of the store controller. In local mode, it operates as a typewriter. The buffer editing capability is operational in both modes.

## Terminal Addressing

Each 3767-2 on a store loop must have two addresses: a hexadecimal address and a store loop address. The hexadecimal address, which is wired in the 3767, must be assigned by the system user when the 3767 order is placed. There are 20 of these addresses ('CC' through 'DF') available for 3767s, on each store loop. However, these address assignments must be contiguous. The store loop address, also assigned by the system user, must be one of the 63 or 64 terminal addresses available for the respective store loops (see Chapter 11).

## Special Features

### *Vertical Forms Control (VFC)*

With this feature, one page can contain up to 102 vertical tab positions. The operator or the store controller can perform vertical tab and form feed functions.

This feature allows printed output to be arranged in a desired vertical format, either by the operator or by program control from the store controller.

### *Variable Width Forms Tractor*

With this feature installed, the system user can use pinfeed paper with hole-to-hole dimensions of 3 inches to 14.5 inches (76,2 mm to 368,3 mm), overall. This feature must be installed with the Vertical Forms Control feature, to ensure continuous-form registration.

The Variable Width Forms Tractor is recommended for precise forms control, and it is required for continuous forms. Friction-feeding may be used, but this may require occasional readjustment of the form to ensure correct feeding.

### *Roll Paper Holder*

This feature makes it possible to use single-part roll paper within the following specifications:

• Paper width (maximum)	15 inches	(381 mm)
• Roll diameter (maximum)	5.5 inches	(139,7 mm)
• Spool inside diameter (maximum)	0.4 inches	(10,2 mm)
• Paper Weight	16 to 20 pounds	(7,3 to 9,1 kg)
Basis: 500 sheets	17 x 22 inches	(431,8 x 558,8 mm)

Card stock forms are not recommended. Refer to Appendix A for 3767 forms specifications and limitations.

### *Security Keylock*

This feature enables the system user to prevent unauthorized use of the terminal. Each terminal has a unique key. (See Figure 4-2.)

## Operator Panel, Switches, and Keyboard

### *Operator Panel*

The operator panel consists of guidance lights to let the operator know if the terminal is online with the store controller and ready for use, or if the terminal has detected a problem. (See Figure 4-2.)

### *Switches*

The switches let the operator select the mode of operation and any of the installed special features. (See Figure 4-2.)

## ***Keyboard***

The 3767-2 uses a standard 44-key keyboard that generates 88 alphanumeric and special characters. Other function keys are located on either side of the keyboard, for the operator's use in controlling the various functions of the terminal. (See Figure 4-2.) The function keys include typewriter control keys, edit function keys, and store controller communication keys.

## **Applications**

### ***Purchase Orders***

Through user-written application programs, purchase orders can be created on the IBM 3767 Model 2 Communication Terminal and printed on purchase order forms at the 3767 or transmitted to the host processor for printing. These operations are initiated by the 3767 operator and are under the control of the store controller.

The purchase order can be retrieved and printed on the terminal for answering inquiries or for checking against invoices, bills of lading, and actual merchandise received. Information in the purchase order (such as stock number, description, and quantity) can be used as input to the store controller for creating merchandise tickets on the 3657 Ticket Unit. Ticket generation is under the control of user application programs.

### ***Ticketing***

The 3767-2 allows the user to perform ticketing through user-written application programming.

## **IBM-Provided Functions**

### ***Batch Print***

Batch print functions are used for most of the report printing in a retail store. User-written reports may be generated either at the host processor or in the store controller. All reports are first written on the store controller disk file. Most reports are batched together and are printed at a convenient time according to the store operating procedures.

### ***Program***

The program function allows the user to initiate his user-written application programs from the communication terminal. The user program may be strictly of a background nature, or the program may transmit print data to and receive operator-keyed data from the terminal.

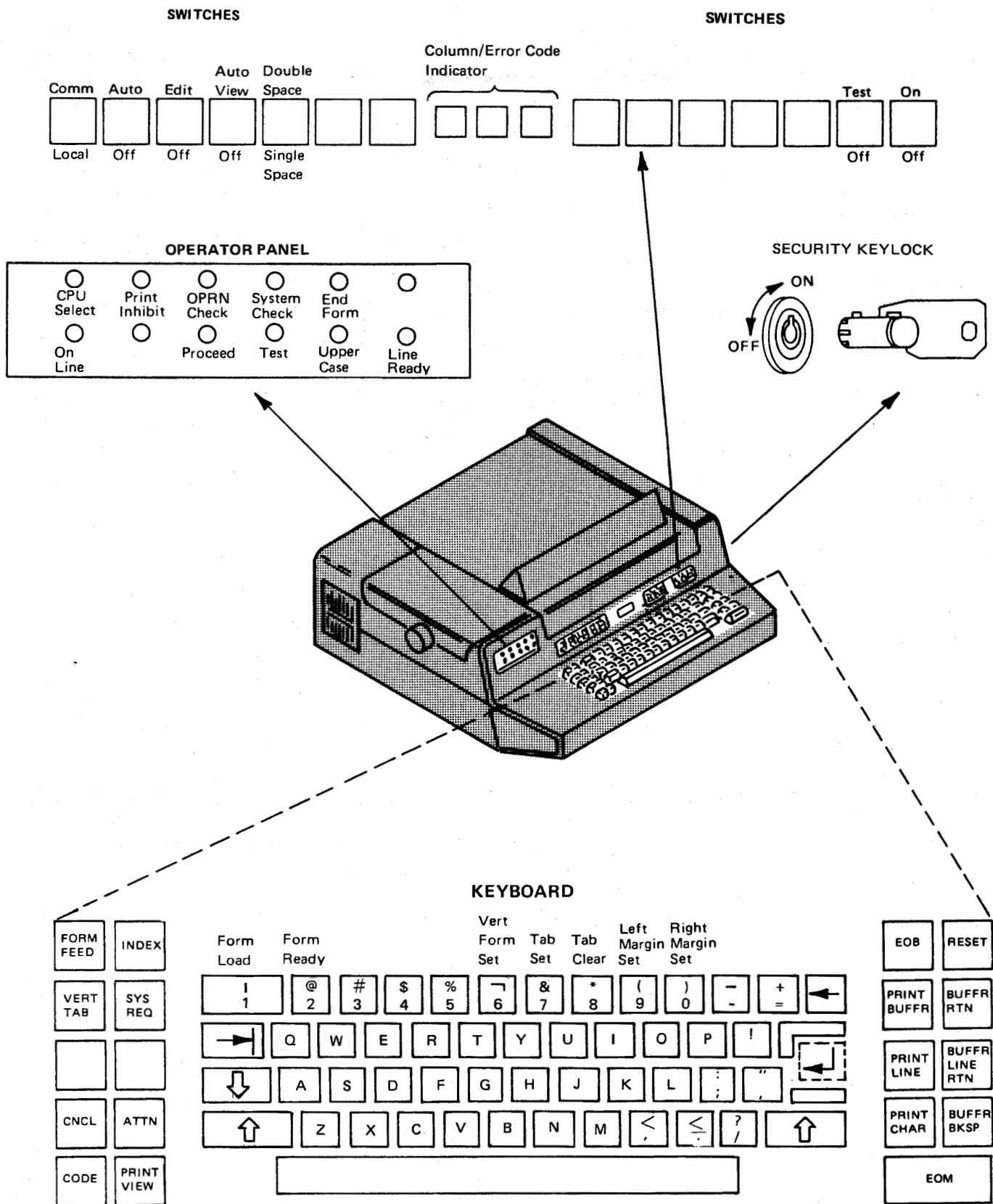


Figure 4-2. IBM 3767 Model 2 Communication Terminal Operating Controls

## Chapter 5. IBM 3275 Model 3 Display Station

The IBM 3275 Model 3 Display Station (shown in Figure 4-1) is a 1920-character display device that can be used for data entry applications and for administrative and management functions. An IBM 3284 Model 3 Printer may be attached, as a special feature, to print messages, reports, and order/receipt forms. Special features for the 3275 are: Printer Adapter, Keyboard Numeric Lock, Audible Alarm, Security Keylock, and 9600 bps Transmission Speed.

The purchasing and receiving departments can use the display station, together with the IBM 3284 Model 3 Printer, to produce purchase orders, to retrieve purchase orders that were created earlier at the host processor, to control shipments of incoming merchandise, to check merchandise received, or to permit receiving personnel to enter data related to receiving transactions. Once receiving data is entered, the display station can be used to initiate production of merchandise tickets by the IBM 3657 Ticket Unit (see Chapter 6). In addition, the display station permits purchase order inquiry and controls the production of exception tickets, price changes, subsequent ticket changes, and merchandise distribution and transfer.

Administrative and management personnel can use the display station for input and inquiry functions related to management, personnel, payroll, or the credit department.

The display station, the store controller, and the host processor, can thus be used in combination to serve many application areas and varying retailer requirements.

Many of these functions require a combination of user-written application programs and the IBM-provided basic functions of the display station.

### Special Features

Security Keylock	This feature prevents unauthorized use of the 3275.
Audible Alarm	The audible alarm is activated when a character is entered into the next to the last character position on the display screen. It can also be activated by the user's program.
Keyboard Numeric Lock	This feature limits the non-numeric characters that can be keyed into a field designated by the program as a numeric field.
9600 bps Transmission Speed	3275s equipped with this feature can be attached to Local Store loop 2 or 3 if the loop is equipped with a compatible 9600 bps Transmission Speed feature.
Printer Adapter	This feature permits attachment of the IBM 3284 Model 3 Printer.



## Application Areas

### *Purchase Orders*

Through user-written application programs, purchase orders can be created on the screen of the display station, printed on purchase order forms either by using the special feature 3284-3 printer or 3784-1 printer, or by transmitting this data to the host processor for printing. These three operations are under control of the store controller and are initiated by the display station operator.

The purchase order can be retrieved and displayed on the screen for answering inquiries and checking against invoices, bills of lading, and actual merchandise received. Information in the purchase order, such as stock numbers, description, and quantity, can be used as input to the store controller for creating merchandise tickets on the ticket unit.



Figure 5-1. IBM 3275 Model 3 Display Station

### *Automatic Ticket Generation*

By using the display station to specify the type and quantity of tickets to be produced by the IBM 3657 Ticket Unit, merchandise tickets can be automatically generated from data entered from receiving documents, by user-written application programs. This application is explained in more detail in Chapter 6.

### *Management Inquiry*

Various levels of store management can use the display station to obtain up-to-date sales data. Daily management reports transmitted to the stores from the host processor may include such information as yesterday's sales, year-to-date sales, season-to-date sales, sales for the corresponding date last year, and today's expected sales. These reports can be used in making decisions on markdowns and quick promotions of selected items.

### *Personnel and Payroll*

The IBM 3653 Point of Sale Terminals can be used to collect commission information and employee discount data. This information may be placed on a user-defined personnel data file for full-time, permanent employees, where it can be immediately available to management through the display station. Online availability of this information can eliminate a number of clerical operations. A display station in the store office also facilitates entering payroll and personnel data for part-time and extra employees.

### *Credit Department Input*

A display station can be used to enter address changes for the accounts receivable file, requests for new charge cards, reports of lost or stolen charge cards, and billing adjustments.

## **Functions**

Functions of the display station include (1) administrative support, (2) user program verification and (3) ticketing support. The administrative support and user program verification functions are described in this chapter. The ticketing support function is described in Chapter 6.

### *Administrative Support*

Administrative support functions can be restricted to authorized personnel only. Optional security codes can also be assigned by the user to individual employees who require access to restricted administrative support functions.

### **Inquiry**

Inquiries into store controller data files and user files can be made from the display station. Responses to these inquiries are displayed on the screen in a predefined format. The format of the information requested is determined by a control record, which is required on disk for every file that is available for inquiry or data maintenance. This control record describes each field in a file record and provides a symbolic name for each field. Before a data record is displayed, the inquiry or data maintenance functions determine if the operator is authorized to access or alter the data records.

## Data Maintenance

Data maintenance, which permits updating of store controller data files and user files on the disk unit, includes the following functions:

<i>Command</i>	<i>Action Taken</i>
Add	Permits the user to add new records. The appropriate file is updated, and the new record is available for inquiry and data maintenance.
Change	Permits the user to alter a record. The old record is displayed and the user enters data for fields to be changed. The appropriate file is updated, and the new record is available for inquiry and data maintenance.
Delete	Permits the user to delete records. The old record is displayed, and if authorization to delete it is received, the appropriate file is updated. Once a record has been deleted it is unavailable for further inquiry and data maintenance.

Any data file available for inquiry or maintenance can be restricted to authorized personnel only. The operator identification is checked against an authorization file supplied by the user. A security code may also be employed for either accessing or updating data on a file basis.

## Host Conversational

The host conversational function allows the user to communicate with the host processor from a display station. This communication can be for the purpose of entering data, such as entering a purchase order in the user's purchase order file at the host processor, or for inquiry, such as requesting information about an item in the user's big ticket item file or credit file at the host processor.

## Batch Print

Batch print functions handle most of the report printing in a retail store. User-written reports may be generated either at the host processor or in the store controller. All reports are first written on the store controller disk file. Most reports are batched together and are printed at a time convenient to store operating procedures.

## Program

The program function allows the user to initiate his user-written application programs from the display station.

## *User Program Verification Facility*

This function is selectable and must be defined during subsystem definition and generation. It provides the user with an aid to assist him in debugging his user-written programs. This function allows the user to display and alter his selected user programs from the 3275 Display Station. With this function, the user may also view a formatted display of the user's program ABEND dump file (SYSDMP).

## Physical Characteristics

### IBM 3275 Model 3 Display Station

The IBM 3275 Model 3 Display Station has a 1920-character display screen capable of displaying 24 horizontal rows of 80 characters each. Under program control, the screen displays predefined forms that can be filled in by the operator, using a keyboard similar to a keypunch keyboard. (Refer to Figure 5-2.) A mark called a *cursor* **1** appears on the screen to indicate where the next character entered from the keyboard will appear. There are keys **2** on the keyboard that allow the operator to move the cursor up or down and to the right or left. Another feature of the display is the ability, under program control, to intensify the brightness of characters that the user desires to have stand out on the screen. The keyboard also has eight function keys **3** that can be used, under program control, to eliminate keying of often-used commands. Their use can be standardized for all applications by user programs or changed to suit each application.

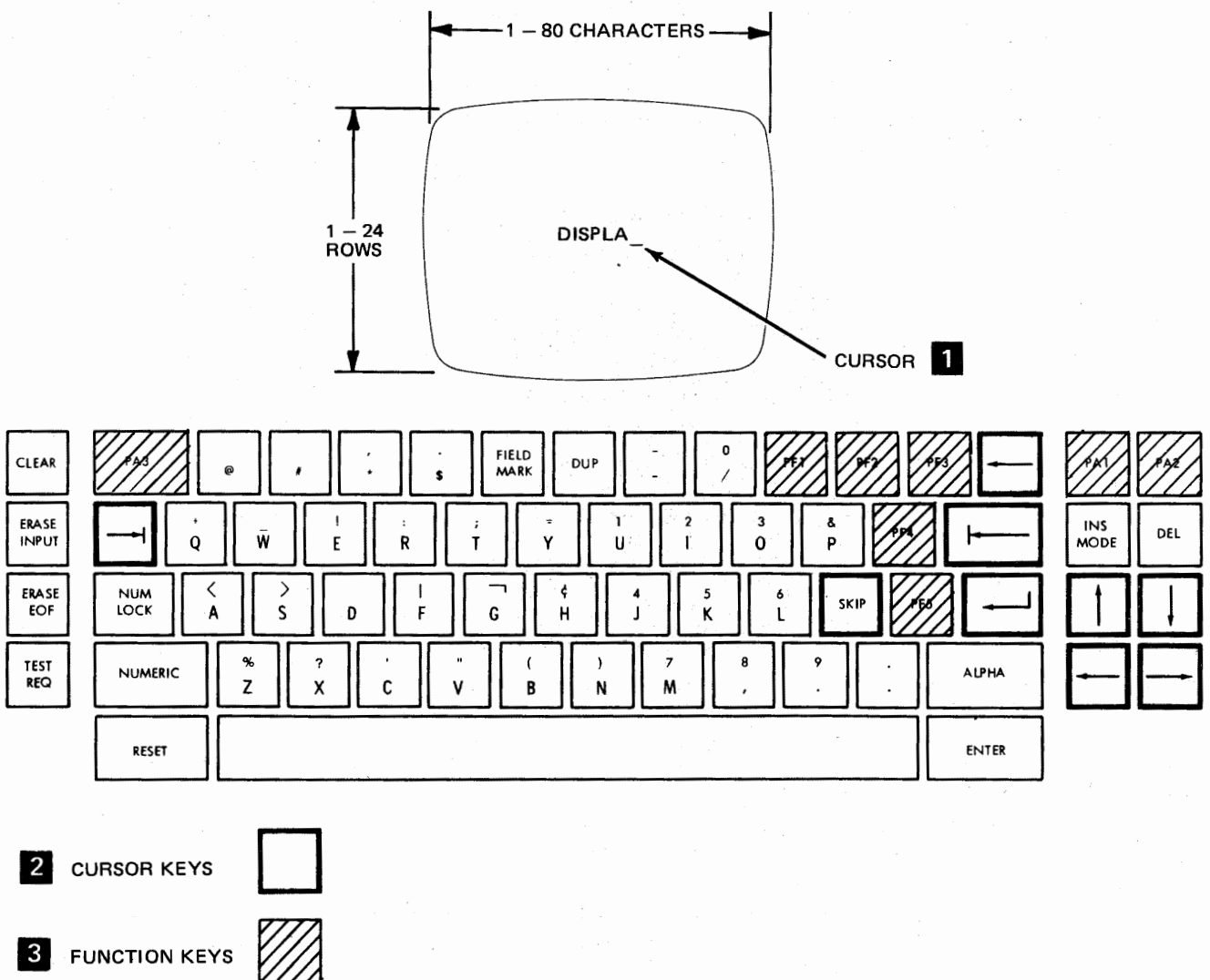


Figure 5-2. Display Station Keyboard and Screen Characteristics

## **IBM 3284 Model 3 Printer**

With the optional 3284 Model 3 printer adapter feature, an IBM 3275 Model 3 Display Station is provided with control circuitry and cable connection outlets to permit attachment of an IBM 3284 Model 3 Printer (Figure 5-3). This printer has a print capacity of 132 characters per line and a maximum print speed of 40 characters per second. Under program control, printouts can be formatted in the same manner as a display image. Fields can be defined as printable or not printable. A new-line or end-of-message control code can be stored in the display station buffer to format the printout.

## **Basic Operation**

When display station power is turned on and communication with the store controller is established (when the SYNC SEARCH and SYSTEM READY indicators are on), a function selection screen is displayed, upon request by the operator. See Figure 5-4.

This display tells the operator the functions that can be selected. The operator selects the function by keying in the appropriate data requested on the screen and then pressing the ENTER key on the keyboard. The store controller returns a preformatted screen to the display station corresponding to the function selected. IBM provides a preformatted screen for the following functions: data maintenance/inquiry, batch print, ticketing, host conversational, program, change options, error log scan, EC level, and program verification.

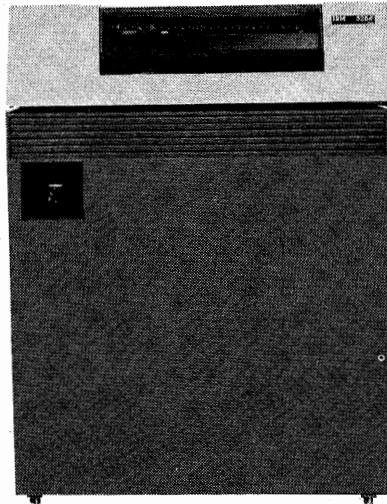


Figure 5-3. IBM 3284 Model 3 Printer Attachment

As an example, the user may need to create tickets for the 3657 Ticket Unit. Again, refer to Figure 5-4. The operator positions the cursor to the first field following TICKETING, enters his ID and security code, and presses the ENTER key, to begin the ticketing function. See the *IBM 3650 Retail Store System Administrative Operations Guide* for details of the ticketing function.

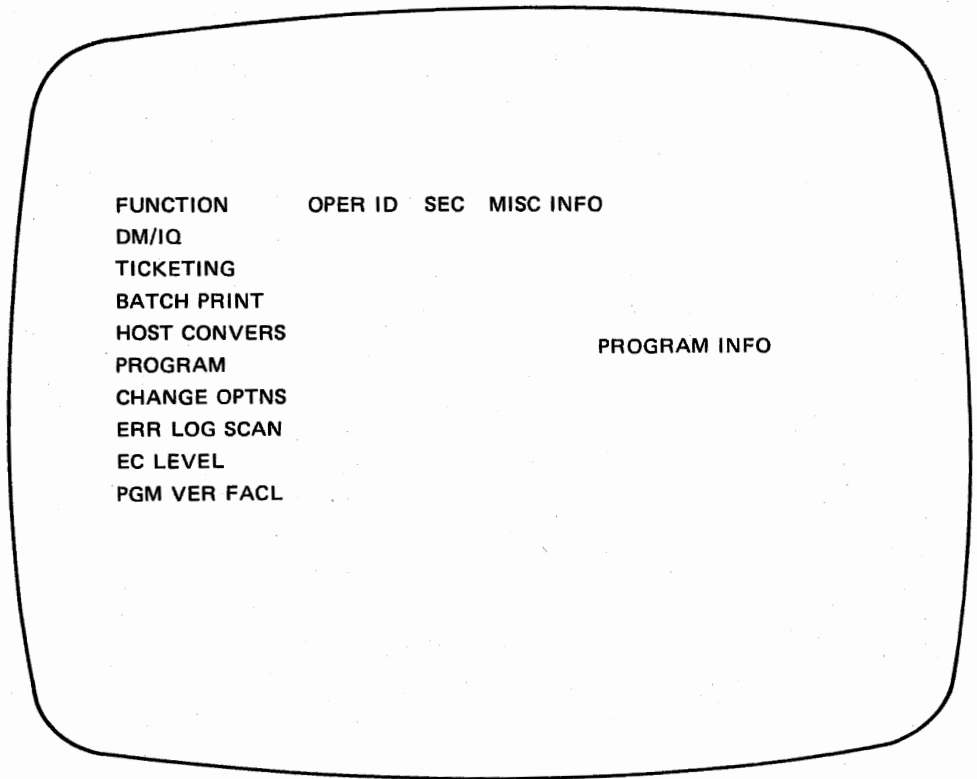


Figure 5-4. Function Selection Screen



## Chapter 6. IBM 3657 Ticket Unit

The IBM 3657 Ticket Unit shown in Figure 6-1, makes and reads merchandise tickets. These tickets contain printed alphanumeric information such as price, item number, class, season, size, and department. The alphanumeric information consists of the characters A through Z, 0 through 9 and other special characters such as dollar signs and half-size numbers. This data can be printed in any print position on the 3657 ticket media. Each ticket can also have a magnetic stripe containing price and descriptive information. This information can be read either by the Magnetic Wand Reader special feature on the IBM 3653 Point of Sale Terminal or by the 3657 Ticket Unit (two-inch tickets, only, can be read by the ticket unit). Information on the tickets contains the price and description information, thus providing the retailer with control as well as flexibility in his merchandise processing and merchandise management operation.

In most cases, tickets are generated as a by-product of purchase order processing, receipt processing, or invoice processing. Tickets are prepared as soon as requests are received from the user's application program, the host processor, or through display stations. Commands can be entered from the display station to delay or prevent the preparation of the tickets. These commands cannot be entered from either the host processor or the user's application program.

The ticket unit is a single-model machine with the following standard features:

- Roll input station
- Hopper input station
- Burster
- Magnetic encode station
- Magnetic verification station
- One print station containing two print heads
- Take-up reel
- Ticket stacker
- Ticket bin
- Control panel
- Terminal control unit

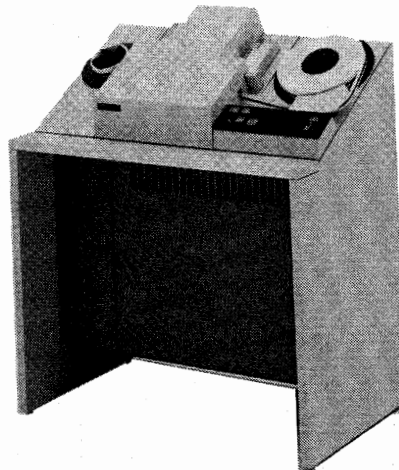


Figure 6-1. IBM 3657 Ticket Unit



## Ticket Processing

The IBM 3657 Ticket Unit can make from 1 to 4095 identical tickets, in batches. There are three sizes of tickets, in 15 selectable formats. Figure 6-2 shows the three sizes of tickets: 1-inch self-adhering labels, and 1-, 2-, and 3-inch tags. All tickets are 1-inch wide. Each batch of tickets can be identified clearly with an extra ticket, referred to as a trailer ticket, that gives instructions to the merchandise markers. A maximum of six ticket units can be attached to the retail store system.

In make-ticket mode, three input-output combinations are possible: (1) roll input-roll output, (2) roll input-strip output, and (3) cartridge input-cartridge output (2-inch tickets only).

Full operational guidance (Figure 6-3) ensures that the operator mounts the correct ticket stock and that warning lights alert him to any changes needed. He can start, stop, or cancel a batch of tickets by pressing the appropriate button on the operator panel.

In Release 3.2, the ticketing application has been improved by incorporating two functions:

- Requeuing of Ticket Purchase Orders After Stop/Cancel

When a Stop/Cancel is issued, this function enables the resumption of ticket production without losing the sequence of the tickets that were being processed, by keeping each purchase order intact.

- Recovery of Ticket Queues

This function relieves the user of implementing a recovery procedure after a machine check, a program check, or after the store controller operator fails to quiesce the system. Additionally, the ticketing Process command provides for the entry of a checkpoint frequency number so that if a failure occurs before completion, processing starts at the last checkpoint taken when the Process command is reissued.

Refer to the *Programmer's Guide* and the *Administrative Operations Guide* for more information on these two functions.

### ***Program-Requested Ticket Making***

Ticket data can be created by the user's purchase order, receipt processing, and invoice application processing programs in the host or store controller. If created by a host application program, the data is transmitted to the host file in the store controller. The 3275 operator issues a Process command, and the tickets are made from the host file. If ticket data is to be created by a user program in the store controller, the user program (when executed) issues SPOOL macros, which cause the specified tickets to be made.

### ***Key Entry Ticket Making***

In addition to program-requested ticket making, tickets can be created by entering ticketing data through the IBM 3275 Model 3 Display Station. This facility also gives the retailer the necessary flexibility for handling markdowns and reticketing situations.

Use the Make command when you wish to enter the data to be printed on the tickets. To go into data entry mode, you must key in the fields of the Make command.

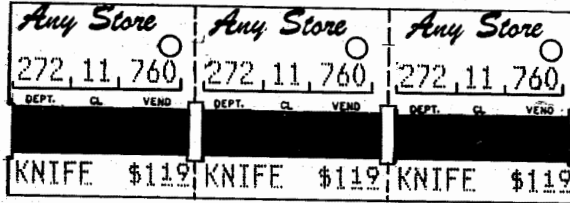
1-Inch Self-Adhering Labels  
(0.94" X 0.94")



Magnetic Strip

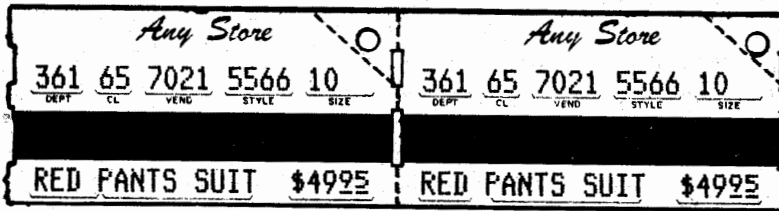
The IBM Ticketing application omits these underscores for countries whose currency is shown in whole units only (for example, 1056 yen, in Japan).

1-Inch Tags



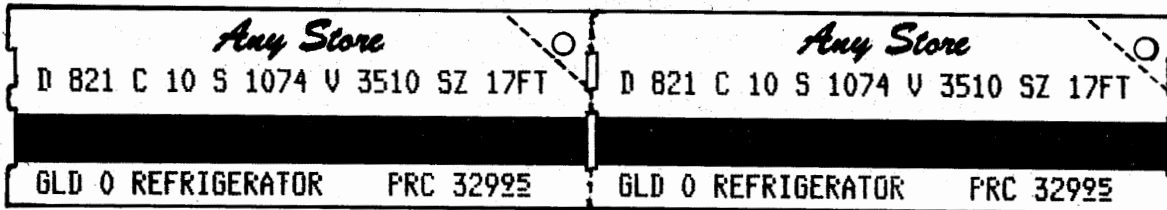
Magnetic Strip

2-Inch Tags



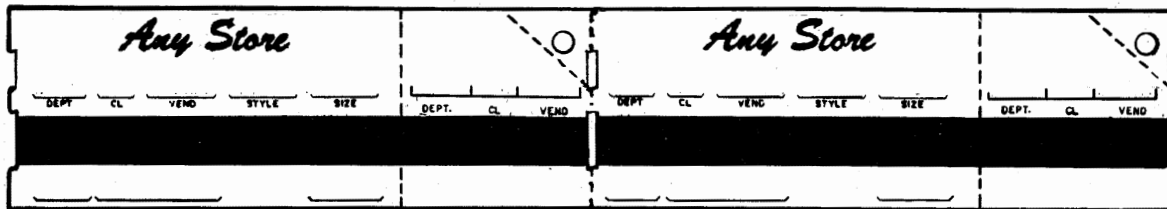
Magnetic Strip

3-Inch Tags



Magnetic Strip

3-Inch Perforated Tags (1" X 2" plus 1" X 1")



Note: For additional ticket ordering information, consult your IBM Information Records Division (IRD) representative.

Figure 6-2. Ticket Samples

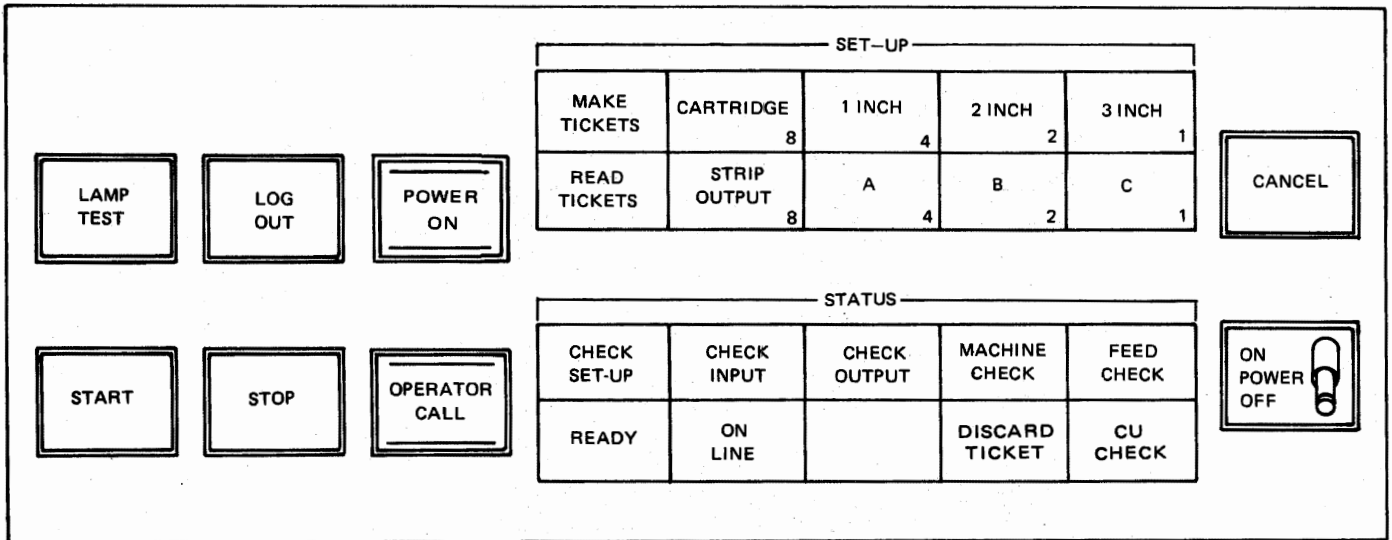


Figure 6-3. IBM 3657 Ticket Unit Operator Panel

When the Ticketing Command Screen is displayed, the cursor is automatically set to the ticket unit address field of the Make command. If you wish to enter data in some other field, for some other command, use the cursor positioning keys on the display station to place the cursor at the desired line. When you select the Make command, the Ticket Make Command Screen (Figure 6-4) is displayed. Thus the Ticketing Command Screen is erased when the second screen is displayed, which contains all of the headings for the fields associated with the selected format number. After you enter data in the unprotected fields following these headings and press the Enter key, the data is transmitted to the store controller and processed for ticket making.

### Operator Prompting

The ticket unit is designed for maximum productivity. Operator intervention is limited, in normal situations, to making the specified ticket setup and loading the ticket stock. Thus, unlike conventional ticket-making equipment, the speed of operation and number of tickets produced is not operator-dependent, because the operator of the IBM 3657 Ticket Unit is not required to set up the machine each time the information changes on the tickets. Operational guidance enables an operator to mount the correct ticket stock. Operator panel lights are provided to assist the operator.

SETUP	
<b>A</b> BATCH TYPE	<b>B</b> BURST CODE
	<b>C</b> TICKET PARTS
TICKETS	
<b>D</b> P.O. NUMBER	DEPARTMENT
VENDOR ID	SEASON
CLASS	INDUSTRY CLS
STOCK	SKU
<b>E</b> DESCRIPTION	STYLE
QUANTITY	SIZE
COLOR	TAX CODE
PRICE	TRANSMIT
MISC PRINT	
TRAILER	
DEPT NUMBER	DEPT NAME
VENDOR NAME	SPECIAL ORDR
STORE	KEY RECORD
LOCATION	ROUTING CODE
#OF PIECES	
MISC RECEIVE	
MISC ROUTING	

- Notes:*
1. Fields A, B, C, D, and E are required on all formats.
  2. The user selects any of the remaining fields to tailor his own ticketing formats; this is usually done by the store's programming staff during system definition.

Figure 6-4. Ticket Make Command Screen

## *Ticket Production and Marking Instructions*

With each batch of tickets produced, an extra ticket (optional), called the trailer identification ticket, can be made. This ticket can be formatted by the user to identify the batch and to give instructions to the marker as to how and where to mark the merchandise. The ticket quantities produced can be based on the actual count of received merchandise.

## *Ticket Reading*

The ticket unit is equipped with batch ticket reading capability applicable to 2-inch tickets only. This feature is important in the following applications:

- Stock counting and physical inventory
- Expediting price changes. For price changes in which a count must be made, reading these tickets can cause the generation of new tickets under user program control.
- Reading tickets collected in departments awaiting installation of the IBM 3653 Point of Sale Terminal with the Magnetic Wand Reader special feature.

With this feature, 2-inch tickets may be read and stored in the store controller for later processing. A plastic cartridge is provided for convenient collection of up to 350 individual 2-inch tickets. This cartridge can be directly inserted into the ticket unit, thereby allowing tickets to be read with a minimum of handling.

Batch tickets that have been read correctly are collected in a ticket bin, inside the ticket unit, for storage or disposal. Batch tickets that have been read incorrectly (tickets that were upside down in the cartridge, damaged, etc.) are diverted to the output cartridge, for reentry into the ticket unit.

On 3657s with a modification for the read mode operation, 2-inch tickets made under format type 1 can be inserted as the first and last tickets in an input cartridge, to provide ticket tracking. These tickets are diverted to the output cartridge with the reject tickets to maintain the tracking information for a rerun or for other processing.

## *Price Change Tickets*

Price change tickets are 1-, 2- and 3-inch tickets that have only price change information on the magnetic stripe. They may also contain any printed information that the 3275 operator defines, within limits allowed by subsystem definition.

Price change tickets allow a 3653 operator to change the price of a ticketed item by using the wand reader rather than the Modify Ticket key of the 3653. The operator wands the price change ticket first, then wands the regular ticket. The price encoded on the price change ticket applies to the item described by the regular ticket.

Price change tickets also can be used for price lookup. This is done by encoding a zero price on the price change ticket. When the operator wands the price change ticket and the regular ticket, the 3653 requests the price from the price lookup file in the store controller. This procedure allows the use of general "sale" tickets (with zero prices) that can be made, attached, and removed easily. The actual sale prices are established and changed on the store controller's disk rather than on tickets.

### ***Log Fixed Function Ticketing Data (Selectable Option)***

In some applications, capturing of data used to generate tickets is required. This selectable function allows the user to specify whether he wishes to log the data used to create his tickets with the fixed function ticketing support feature. The data captured is logged on the transaction log in the store controller. This function does not include capturing and logging any data that comes from the host or other user programs and is entered into the fixed function ticketing support program.

### ***Authorization Code Tickets (Release 3.1 or Later)***

Authorization code tickets are nonmerchandise tickets that may be encoded and printed on 1-, 2-, or 3-inch ticket stock or adhesive labels. The authorization code ticket contains a four-digit authorization code and may be wanded or key-entered at a 3653 terminal. This authorization code may be used to authorize the following types of entries at a 3653 terminal during sales mode:

- Negative entries
- Checks
- Offline charge transactions.

### ***Employee Identification Tickets (Release 3.1 or Later)***

Employee identification tickets are nonmerchandise tickets that may be encoded and printed on 1-, 2-, or 3-inch ticket stock or adhesive labels. The employee identification ticket may contain up to eight digits of identification information. These identification tickets may be wand-entered at a 3653 terminal whenever the SALESPERSON guidance light is on in sales mode.

### ***Credit Card Tickets (Release 3.1 or Later)***

Credit card tickets or labels may contain an account number that is up to 15 digits in length and an optional customer name (fixed length of 15 characters). The account number may be wand-entered at a 3653 terminal when the ACCOUNT NO. guidance light is on for charge transactions.

### ***Print-Only Tickets (Release 3.1 or Later)***

Beginning with Release 3.1, the user can use 1-, 2-, or 3-inch ticket stock without the magnetic stripe and ticket formats 1 through 8 for printed information only. An Engineering Change must be installed on the 3657 Ticket Unit before this option can be selected.

## Ticket Sizes

The IBM 3657 Ticket Unit processes batches of from 1 to 4095 identical tickets, in the following sizes:

- 1-inch 1" by 1"
- 2-inch 1" by 2"
- 3-inch 1" by 3" (also 1" by 2" plus 1" by 1", perforated)

1" X 1" self-adhering label dimensions apply to the label and backing. The label, when detached, is 0.94" X 0.94".

Tickets can be made from rolls or cartridges (2-inch tickets only). In addition, tickets can be read from the cartridge (2-inch tickets only). Each cartridge holds up to 350 of the 2-inch tickets.

Ticket Processing speeds are as follows:

<i>Processing Mode</i>	<i>Ticket Size</i>	<i>Speed (tickets per minute)*</i>
Make	1-inch	500 (on roll)
	2-inch	250 (on roll) 130 (in cartridge)
	3-inch	167 (on roll)
Read	2-inch	130 (in cartridge)

\*Throughput varies with the batch size, number of usable tickets, burst mode, store controller service time, etc.

Printed and magnetically encoded information depends upon the ticket size and the application format. A total of 16 formats may be selected during system definition.

For programming considerations of ticket formats, see *IBM 3650 Retail Store System Programmer's Guide*.

The maximum numbers of print characters and magnetically encoded characters allowed when creating these application formats are as follows:

<i>Ticket Size</i>	<i>Ticket Type</i>	<i>Maximum Number of Characters</i>	
		<i>Print Characters</i>	<i>Encoded Data Characters</i>
1-inch	merchandise	22	19*
	batch identification	22	none
2-inch	merchandise	42	40
	batch identification	42	none
3-inch	merchandise	64	60**
	batch identification	64	none

\*19 encoded data characters are allowed on one format of 1-inch tickets. All other 1-inch ticket formats allow only 17 encoded data characters.

\*\*60 encoded data characters are allowed on 3-inch nonperforated tickets; 40 encoded data characters are allowed on the 3-inch perforated tickets that have a stub (see Figure 6-2). The perforation for this stub is located 2 inches from the left edge of the ticket. This ticket is referred to as the "2 + 1" ticket.

## Key Entry Ticket Processing

### *Merchandise Ticket Processing*

The display station operator can request that a specified type of ticket be made or read by the ticket unit and transmitted to the store controller for processing. In addition, the display station (Figure 6-5) can be used to change the sequence in which ticket batches are handled by the ticket unit and to route all batches of a specified type of ticket from one ticket unit to another.



TICKETING APPLICATION COMMANDS				
PRIORITY	3657 ADDR	BATCH TYPE	P.O. #	
CANCEL	3657 ADDR	BATCH TYPE	P.O. #	PRIORITY
HOLD	3657 ADDR	BATCH TYPE		
RELEASE	3657 ADDR	BATCH TYPE		
ROUTE	FROM 3657 ADDR	TO 3657 ADDR		BATCH TYPE
DISPLAY	3657 ADDR	TYPE STATUS		
		TERMINAL		
		ALL		
		BATCH TYPE	P.O. #	
READ	3657 ADDR	BATCH TYPE		
MAKE	3657 ADDR	FORMAT #		
PROCESS	HOST FILE	CHECKPOINT NUM		

Figure 6-5. Ticketing Application Command Screen

## Chapter 7. IBM 7481 Data Storage Unit (Release 3.1)

The purpose of the IBM 7481 Data Storage Unit is to collect, and to temporarily store on a magnetic tape cartridge, data related to merchandise items, sales, and charge accounts, when communication between the store controller and the point of sale terminals is interrupted. Then, after communication has been restored with the store controller, the 7481 will, upon request from the store controller, transmit the stored transaction data to the store controller. It can also be used to initialize point of sale terminals, if the store controller is not available, and to dump or restore store controller files, by user programming.

In Release 3.2, when the system is initialized, 7481 availability tests are performed to verify proper 7481 operation. Indications are given (at the store controller operator panel, or at the 7481) as to whether or not the 7481 has been successfully initiated. These indications are detailed in the *Problem Determination Procedures and Operator Messages* manual.

The 7481 can operate at a store loop speed of either 2400 bps or 9600 bps. To operate at 9600 bps: (1) the 7481 must be attached to a local store loop with the 9600 bps special feature installed (on the store controller) and (2) the OPERATING MODE switch on the 7481 must be set to the 9600 BPS FEATURE position. On a 9600 store loop, the 7481 can store files, perform a dump, or retrieve logged data.

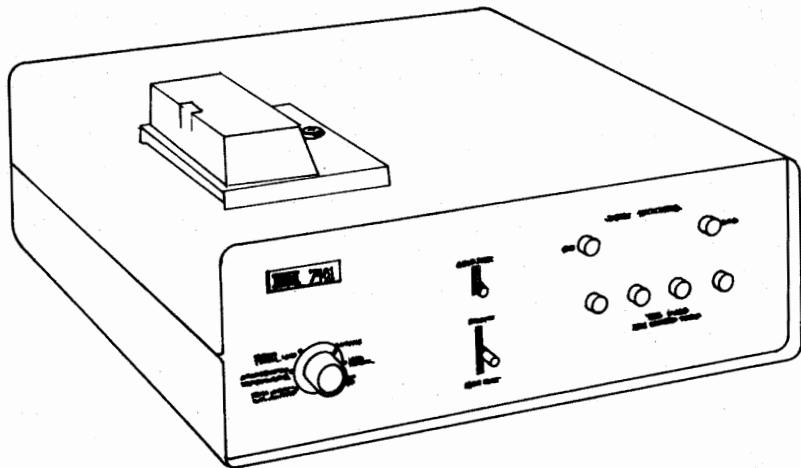


Figure 7-1. IBM 7481 Data Storage Unit

The 7481 may be used at a local or remote store location. For local stores, it is connected between the store controller and the store loop. (See Figure 7-2.) For remote stores, it is connected between the 3659 Remote Communications Unit and the store loop segment.

Each 7481 must have two addresses, which are assigned by the user at subsystem definition time.

During normal operation, the 7481 responds as the first terminal on the local or remote store loop. During a backup operation, the 7481 monitors the store controller and communicates with the point of sale terminals (at the most current EC level at the time of Release 3.1 shipment) on the store loop to which the 7481 is attached.

The cable connections, the audible alarm, and the Power switch are located on the rear panel. Control switches and lamp-type indicators for user and service personnel are located on the front panel.

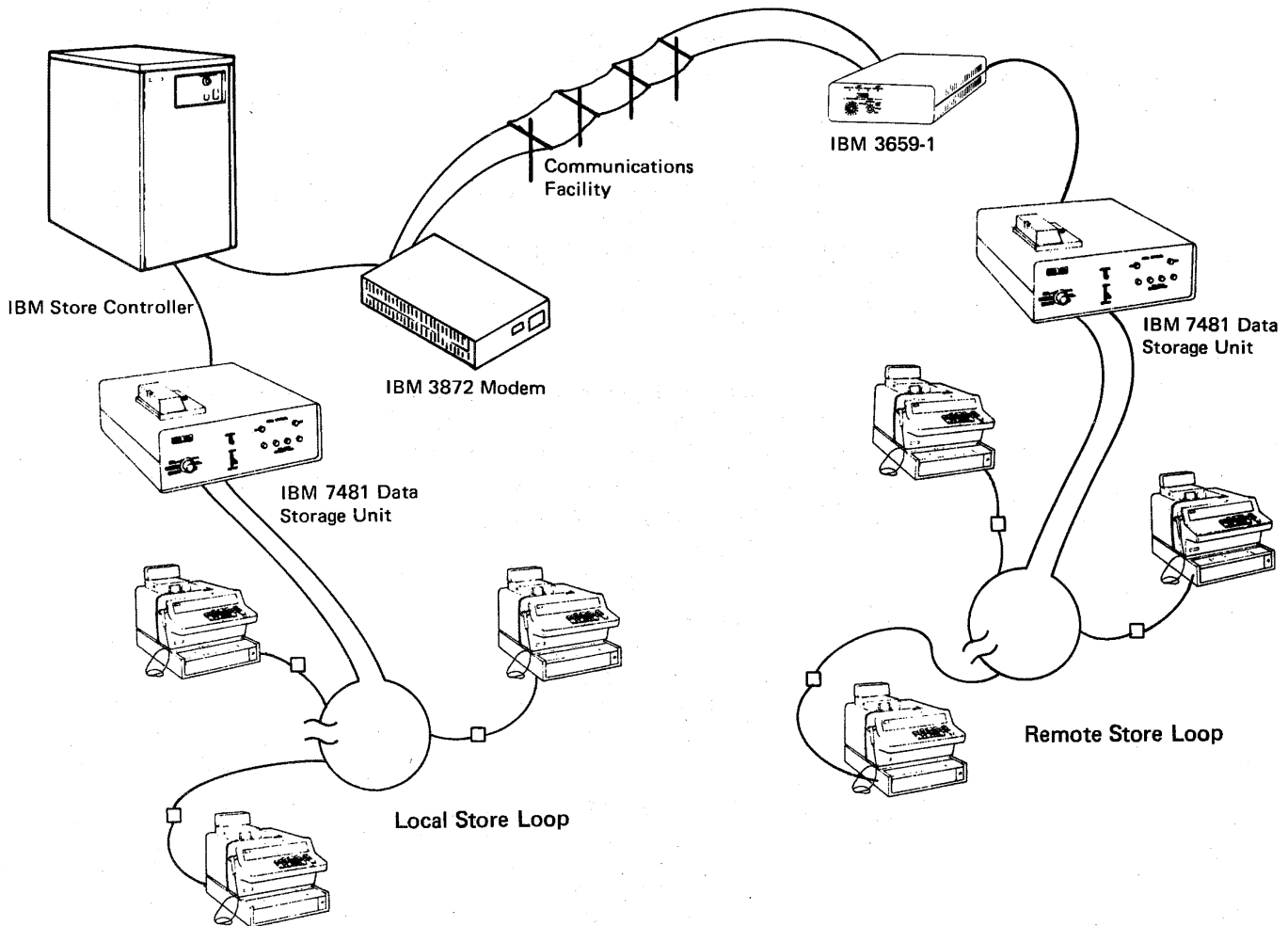


Figure 7-2. Local and Remote Store Loops with IBM 7481 Data Storage Units.

## Functional Operating Modes

The 7481 modes of operation are selected by the system user, who selects the desired mode by setting an OPERATING MODE switch that is located on the front panel of the 7481.

The OPERATING MODE switch has six positions. They are: NORMAL, LOAD TERMINALS, LAMP TEST, CREATE TERMINAL LOAD, STORE CONTROLLER, and 9600 BPS FEATURE.

## **Normal Mode**

With the OPERATING MODE switch set to NORMAL, the EXECUTE/ALARM RESET switch, when moved to EXECUTE, activates the 7481 to go into the normal mode of operation. The 7481 has two functions in normal mode; they are described in the following paragraphs.

### **Monitor/Online Feature**

The 7481 monitors communication between the store controller and the store loop. The store controller directs the 7481 in three online operations: reading the transaction data previously collected and written on the tape, erasing the data on the tape, and writing a tape label at the beginning of each tape.

When the store controller operator is ready to transfer the stored data from the tape to the store controller, the 7481 is requested either via the store controller panel or a user program to read the tape and to transmit data to the store controller. Thus, transmission of the data accumulated on the tape is controlled by the user at the store controller. When the data is retrieved via the store controller panel, the retrieved data is stored in the store controller, in a separate file designated for the 7481 transaction log.

To prevent intermixing of current data with obsolete data that may be on the tape, all obsolete data should be erased before the tape is reused. When a data retrieval operation initiated via the store controller panel has been completed, the basic 7481 retrieval function causes the 7481 to automatically erase the tape and return to normal mode. But by user program, erasing the tape may be made optional if the tape data is to be maintained for further use.

### **Monitor/Log Function**

To log 3653 transactions, the 7481 OPERATING MODE switch must be set to the NORMAL position, and a properly labeled tape must be inserted in the 7481. Then, if communication between the store controller and the store loop is interrupted for 30 seconds (or longer), the 7481 enters log mode (for backup operation). During backup operation, the 7481 monitors the store loop signals from the store controller and communicates with the point of sale terminals on its store loop. In log mode, the 7481 polls the store loop and accepts transaction data from the point of sale terminals. The 7481 then stores this data on the tape for later transmission to the store controller.

When the store controller is available for communication with the store loop, the 7481 stops its log mode operation and relinquishes control of the store loop to the store controller. The 7481 is then online with the store controller, and if logging is required again, the 7481 logs the transaction data, starting at the end of the data previously logged.

*Note:* Whenever a transition of store loop control occurs between the 3651 and the 7481, all terminals that have a transaction in process go into an offline mode until the transaction has been completed. This transaction is recorded on the transaction journal tape, with an indication that the point of sale terminal was offline. Transaction data must be reentered only for the transactions that are completed while the point of sale terminal is offline from both the store controller and the 7481. These transactions are indicated by an XXX on the total lines recorded on the transaction journal tape.

### **Initializing Point of Sale Terminals**

Before a 3653 Point of Sale Terminal can be used as a cash register or for data collection, it must receive initialization data. This data, which tells the terminals how to handle information, is kept in the store controller, which provides the data to local and remote loops during normal operation. If the store controller is unavailable, or if it is incapable

of sending the initialization data, the 7481 can be used to send the data to the 3653s. (The 3653s must be at the current engineering change (EC) level at the time the 7481 is shipped.)

The 7481 uses a tape on which the initialization data has been previously recorded. Therefore, this mode involves two functions: (1) recording the initialization data from the store controller on the 7481 tape prior to the loss of the store controller connection, and (2) sending this data on the 7481 tape to the point of sale terminals when communications to the store controller is not available.

### **Creating the Point of Sale Load**

Initialization data stored in the store controller can be recorded on tape by the 7481 to ensure that the data is available to initialize the point of sale terminals whenever the store controller is not available.

### **Loading the Point of Sale Terminal**

The point of sale terminal is not automatically loaded. The initialization data must be recorded on the tape, as previously discussed, before any store controller or remote communications unit malfunction occurs.

To initialize (load) the point of sale terminals on a loop using the 7481, insert the tape containing the initialization data, set the OPERATING MODE switch to the LOAD TERMINALS position, and push the EXECUTE/ALARM RESET switch to EXECUTE. This notifies the 7481 to start transmitting the initialization data to all point of sale terminals on the store loop that is dedicated to the 7481. The 3653 power must be turned on, and it must be properly signed on (with terminal address, security code, transaction number, and date entered) before the 7481's transmission of initialization data begins. When the initialization is completed, the 3653s go into salesperson mode.

This procedure must be repeated at a 7481 at each store location and on each store loop. The status indicators and 7481 alarm inform the operator when the loading procedure has been completed. A tape for logging transaction data should then be inserted, the OPERATING MODE switch should be set to NORMAL, and the EXECUTE/ALARM RESET switch pushed to the EXECUTE position. The 7481 then polls the point of sale terminals and logs the transaction data.

When the store controller becomes available for operating with the store loop, it automatically takes over the operation of all point of sale terminals. This is done at the beginning of the next transaction after the store controller commands the 7481 to relinquish loop control.

### ***Lamp Test Mode***

The OPERATING MODE switch can be used, by the operator, to identify and replace any nonoperational indicator lamp(s) on the front panel of the 7481. This can be done by setting the switch to the LAMP TEST position.

### ***Using the 7481 as File Storage***

The OPERATING MODE switch has two positions, STORE CONTROLLER and 9600 BPS FEATURE, that allow using the 7481 as a separate controller file, via user programming. Also, when the OPERATING MODE switch is in either of these two positions, logged transaction data can be retrieved either via the store controller panel or by user programming.

When the OPERATING MODE switch is set to the STORE CONTROLLER position, the 7481 functions at 2400 bps. When the OPERATING MODE switch is set to the 9600 BPS FEATURE position, the 7481 operates at 9600 bps, but this position may be used only when the 7481 is on a local store loop that has the 9600 bps feature installed.

When the OPERATING MODE switch is in the STORE CONTROLLER position, the 7481 continues to monitor communications between the store controller and the store loop to which the 7481 is connected. However, if communications are interrupted while the 7481 is in store controller mode, the 7481 does not go into a transaction log mode. Under these conditions, the 7481 sounds the audible alarm to alert responsible user personnel to the fact that communications have been interrupted. User personnel should then follow established operating procedures to reestablish communications or to place the 7481 in transaction log mode.

### ***Functions Available by User Program***

The 7481 can perform online functions by commands (controlled by user programs) from the store controller. The 7481 can write or read data in 512-byte blocks; read or write tape labels; erase obsolete data; and inform the operator, through indicators and/or an audible alarm, of the necessary setup procedure. Therefore data can be written on tape and retrieved from tape.

The 7481 can perform certain online functions when it communicates with a user program that is executing in the store controller. Functions that can be performed by user programs are: (1) retrieving logging data, either in normal or in store controller mode, (2) erasing and relabeling log tapes, (3) offloading, and later restoring, controller files, (4) erasing obsoletes log, IML, or user tapes, and (5) performing other miscellaneous functions that require a secondary storage device such as a magnetic tape cartridge. By user program, the 7481 can also be used in the optional local store loop with the 9600 bps feature installed.

## **Switches and Indicators**

In addition to the OPERATING MODE switch, there are six indicators and two switches on the front panel of the 7481. The functions of the OPERATING MODE switch and the EXECUTE/ALARM RESET switch have been previously described. The indicators and the CHANGE TAPE switch are described in the following text.

### ***CHANGE TAPE Switch***

The CHANGE TYPE switch is used to bring the 7481 to a controlled stop, while the 7481 is in the normal mode (transaction logging). This allows the 7481 operator to change the tape cartridge without losing transaction data.

### ***ONLINE Indicator***

This indicator is on any time the unit is online with the store controller. It is turned ON by the store controller and turned OFF by the 7481, when the 7481 goes to log mode.

### ***BUSY Indicator***

This indicator is controlled by the 7481 or the store controller, and it is on any time the unit is in operation or in session with a store controller application.

### ***Status Indicator***

The 7481 has four status indicators on the front panel, to define the operating status of the 7481. A Status/Action chart defines each specific 7481 status for the operator when various combinations of these numbered indicators are on. This chart is located on a pullout tray beneath the 7481.

## **Retrieval of 3653 Data Stored by the 7481**

The 7481 transmits two types of offline transaction data to the store controller: (1) label information from the tape, and (2) transaction data collected from the point of sale terminals. Upon command from the store controller operator, the IBM-supplied store controller retrieval function will format and log the data in a backup log that is similar to the transaction log. At the conclusion of the logged-data retrieval, the tape is erased and a new log label is written.

### ***Header Record***

The tape label information is used by the retrieval function (supplied by IBM) to build a header record for the 7481 and sales transaction log. The header record contains such items as the 7481 address, a unique record code, the time of day, a sequence number, and an identifier. This is the first record placed in the 7481 and sales transaction log when the 7481 transmits its stored data to the store controller.

### ***Transaction Data***

The offline transaction data stored by the 7481 is transmitted to the store controller, where it is reformatted and logged. The format is similar to that of the transaction log.

One of the new record formats used in the backup log contains such items as the current transaction number, the net balance due, sales plus, sales minus, cash, and noncash. It is used instead of the balance due record, which is written in the transaction log when each transaction is completed. The record code indicates normal or abnormal completion of the transaction. This type of record is necessary so that a balance report can be run on a 3653 that completes the sales period while it is operating offline.

Processing offline sales data in the backup log is the user's responsibility.

### ***Trailer Record***

The last record for each tape retrieval is a trailer record that indicates whether or not all of the recorded data was successfully retrieved.

## Chapter 8. Communications Devices

Communications devices physically connect devices that communicate with each other and control the data flow between these devices. Communications devices provided by IBM for the IBM 3650 Retail Store System are the IBM 3872 and IBM 3874 Modems; IBM 3659 Remote Communications Units; and the IBM 3704 or 3705 Communications Controller. Communications facilities connect the modems. See Chapter 11 for additional information.

### Modems

Data to be transmitted between devices must be converted to signals that can be accommodated and transmitted by appropriate communications facilities.

IBM 3872 and IBM 3874 Modems perform this function. Data being transmitted by a device is converted to signals, for transmission by the modem connected to the transmitting device. The signals, when received, are then reconverted to digital data, by the modem connected to the receiving device.

### IBM 3659 Model 1 and Model 2 Remote Communications Units

Terminals in the same building as the store controller are connected to the store controller by lines referred to as a *local store loop*. In most cases, a large number of terminals are connected in this manner. However, there is a need to have IBM 3275 Model 3 Display Stations, IBM 3657 Ticket Units, IBM 3653 Point of Sale Terminals, and 3767 Model 2 Communication Terminals in remote locations, such as warehouses and branch stores.

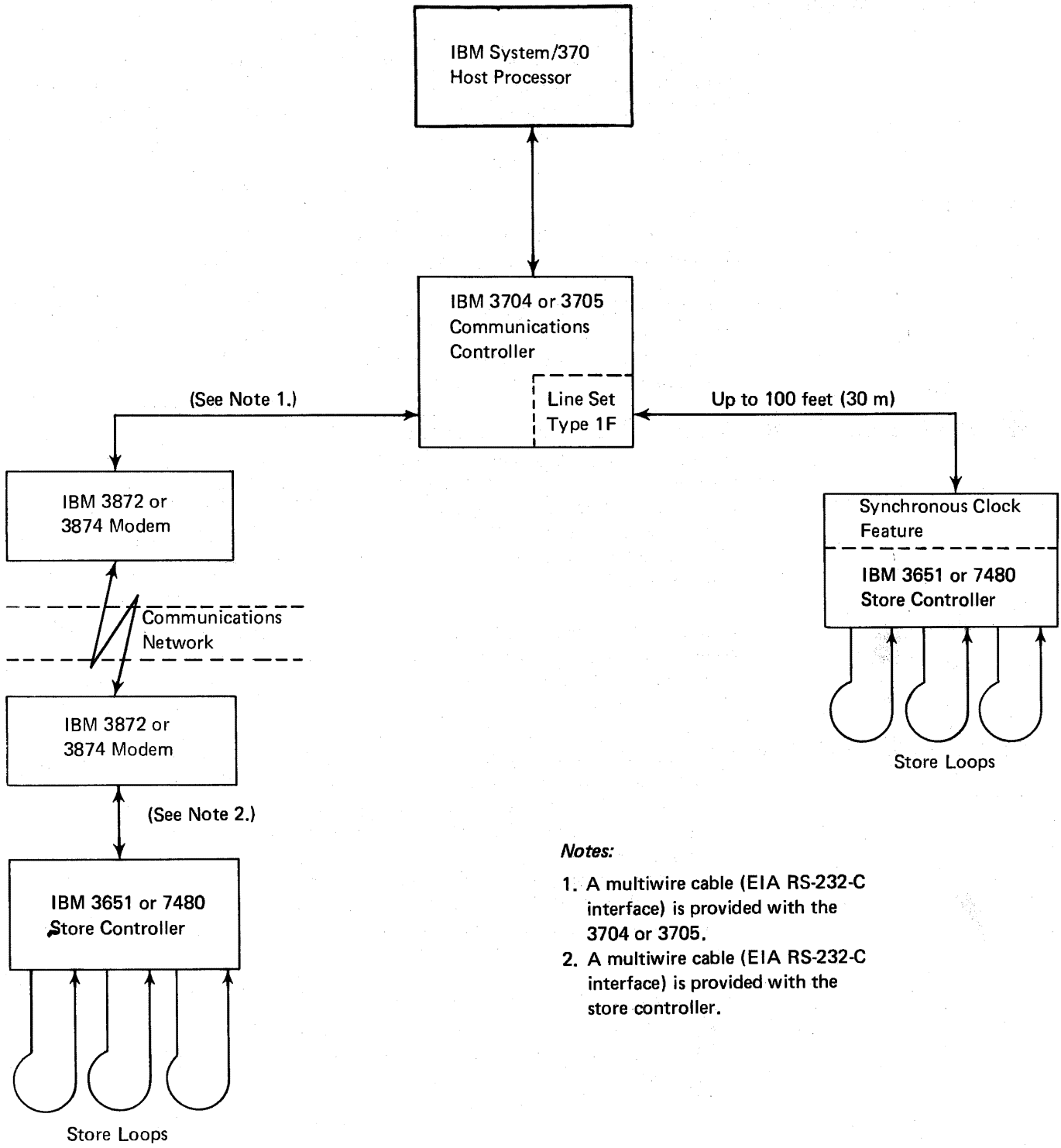
Remote locations are connected to a store controller by a remote store loop. An IBM 3659 Remote Communications Unit installed at each remote location allows remote locations to be connected to a remote store loop. Further explanation of this facility is given under "Remote Store Loops" in Chapter 11.

### IBM 3704 and 3705 Communications Controllers

In a retail store system, there is usually one store controller for each store supported by the system. These store controllers are connected to the host processor by modems, communications lines, and the IBM 3704 or 3705 Communications Controller. Data flowing from the store controllers to the processor can be compared to traffic flowing through a busy intersection. The IBM 3704 or 3705 is the intersection and traffic light. The 3704 or 3705 controls the flow of data into, and out of, the host processor. Additional information about the 3704 and 3705 is given in Chapters 10 and 11.

The Synchronous Clock special feature, available on the store controller, allows the store controller to be cable-connected (by a maximum of 100 cable feet) to an IBM 3704 or 3705 Communications Controller, without requiring communications facilities. Refer to Figure 8-1.





**Notes:**

1. A multiwire cable (EIA RS-232-C interface) is provided with the 3704 or 3705.
2. A multiwire cable (EIA RS-232-C interface) is provided with the store controller.

Figure 8-1. IBM 3650 Retail Store System Communications Options

## Chapter 9. IBM System/370 Host Processor

In an IBM 3650 Retail Store System, the IBM System/370 (Figure 9-1) is normally located in a central site and connected to an IBM 3651 or 7480 Store Controller at a remote store location. This brings the capability of a large data processing system to a remote store, without imposing the costs of a data processing staff upon that store.

Each store in a large retail organization can remain autonomous and yet take advantage of the facilities at the company's data processing center. This autonomy can apply in the areas of credit, customer relations, inventory, pricing, and personnel, on an exception basis, and yet these same areas can be served more efficiently and economically by making use of central data processing.

A store can request that an application program, such as sales analysis, be executed at the host and that reports from this analysis be transmitted to, and printed at, the store.

Input to a host application program, such as a purchase order entry, can be entered at a store from an IBM 3275 Model 3 Display Station, and IBM 3767 Model 2 Communication Terminal, or an IBM 3653 Point of Sale Terminal and then transmitted to the host processor. The purchase order may then be displayed on the 3275 or printed on the 3767 for verification.

Pricing merchandise items can be done at the host and the pricing data can then be transmitted to the store, to be encoded and printed on tickets by the IBM 3657 Ticket Unit.

Records can be maintained at a store controller for the employees of a store, and yet payroll and benefit programs can be executed and processed more efficiently and economically by centralized data processing.

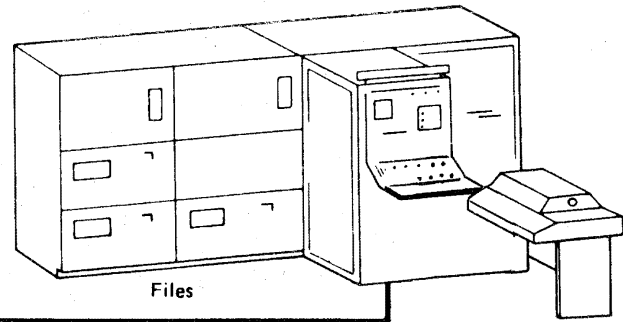
The desirable capability of having purchasing or receiving departments, accounting departments, warehouses, and retail sales departments, in individual stores of a large retail company, to operate online with a central processing system, is provided by the IBM 3650 Retail Store System.

**CENTRAL  
PROCESSING  
SITE**

IBM System/370 Host Processor

IBM 3651 Model 50  
or IBM 7480 Store  
Controller

IBM 3704 or 3705  
Communications  
Controller



Files

Store Loops

IBM 3872 or  
3874 Modems

**COMMUNICATIONS  
FACILITIES**

To Other  
Retail Stores

**RETAIL  
STORE  
SITE**

IBM 3651 Model 50  
or IBM 7480 Store  
Controller

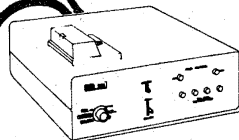
IBM 3872 or  
3874 Modem

A maximum of 64 terminals can be attached to each of these store loops. Either (or both) of these store loops can be specified for local terminals located at the same facility as the store controller, or for remote terminals at retail stores, warehouses, etc. located remotely from the controller. Each 7481 occupies one store loop address.



IBM 3784  
Line Printer

Store Loop #3  
Store Loop #2

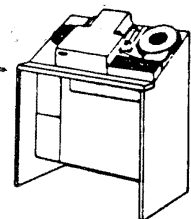


IBM 7481 Data  
Storage Unit



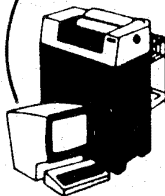
IBM 3653  
Point of Sale Terminals

Store Loop #1 (local only)  
with a maximum of 63  
terminals. The 7481 occupies  
one terminal address.

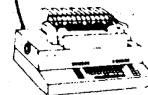


IBM 3657  
Ticket Unit

IBM 3275 Model 3  
Display Stations



IBM 3284 Model 3  
Printer



IBM 3767 Model 2  
Communication Terminal

Figure 9-1. IBM 3650 Retail Store System with Host Processor

## Chapter 10. Programming Support

Information in this chapter is primarily for the retailer's systems analysts and programmers who are responsible for customizing an IBM 3650 Retail Store System to fit their store's specific needs. A general understanding of OS/VS or DOS/VS concepts and facilities is prerequisite for understanding the information in this chapter.

Programming support available from IBM for the retail store system consists of:

- Subsystem support services
- User programming for defining user applications at the store controller
- A host access method for communications between the host processor and the store controller

### Subsystem Support Services

IBM supplies subsystem support services as a convenient tool for creating and maintaining the store controller operational environment. The major functions of subsystem support services are:

- Building and maintaining the subsystem library
- Creating the store controller operational environment
- Transmitting the operational environment to the store controller
- Providing utility services to the host processor and the store controller.

#### *Building and Maintaining the Subsystem Library*

The first step a user must take to prepare his store controller for operation is to build his subsystem library. This library will contain all of the IBM-supplied controller data. Additionally, as the user writes his own controller application programs (such as purchase order creation), he can add them to the library. The combination of the IBM-supplied data and the user-written application programs resident in the subsystem library allows the user to create an operational environment from the library.

Control cards defining the function to be performed are necessary to build and maintain the subsystem library. By using these control cards, the user can add, replace, alter, delete, or rename portions of the library. Furthermore, he can dump the library and restore it; he can print out any portion of the library or print the library directory. Finally, as a result of any manipulation of the library, subsystem support services prints out a completion report that indicates the functions that were performed.

#### *Creating the Store Controller Operational Environment*

After the user has built his subsystem library, he is ready to create one or more initial machine loads (IMLs) for his operational environment. He defines the configuration of the terminals attached to the store controller and the business options he desires. Next, he codes and assembles subsystem definition macros. The information in these definitions includes such items as charge plan options, credit plan definitions, batch printing specifications, and price ticket formats. The user enters the system definition statements or macro output, along with the proper JCL, into his System/370, and subsystem support services creates the operational environment.

The user can create as many as five IMLs for any particular store controller. This flexibility allows the store to operate differently at different times of the day, week, or month, thereby adjusting the store's operation to the actual business environment.

The user validates his input to the system definition process by inspecting the macro assembler listing. The listing includes error messages and option summary reports.

### ***Sending the Operational Environment to the Store Controller***

The next function provided by subsystem support services is that of transmitting the data for the operational environment to the store controller. Once again, the user enters control cards and JCL to accomplish the transmission. Subsystem support services establishes contact with the store controller, then performs the function specified by the user.

In this operation, the user has the option of sending the complete operational environment or only selected portions. This capability is most useful when data for the operational environment has already been transmitted and the user merely wishes to add something to it, such as a newly written application program. In this case, the user supplies subsystem support services with the name of the program (as it is listed in the subsystem library) and subsystem support services sends it to the store controller. However, in either case subsystem support services records all important operations (or errors) on the transaction journal that is maintained at the host, thereby ensuring an accurate and complete record of the data sent to the store controller. If the transmission is prematurely terminated, it may be restarted at or near the point of termination by using the SSS Checkpoint Restart facility (Release 3.1 or later).

### ***Using the Utility Services of Subsystem Support Services***

The utility features of subsystem support services allow the user to manipulate control information and user application information in both the host processor and the store controller. They also allow the store controller to receive control information from the host processor and to send control information to it. When the store controller communicates with the host processor, the system is said to be operating in *interactive* mode. Conversely, when utility functions are performed only at the host, the system is in *batch* mode.

As in the functions of subsystem support services previously described, the user enters JCL and control cards that state the function he wishes to be performed. Subsystem support services analyzes the control cards, establishes contact with the store controller (if necessary), and performs the desired operation. Examples of possible outputs are: printouts of (1) the subsystem library directory, (2) the complete transaction journal, (3) any module on the subsystem library, (4) the contents of any IBM-created or user-created data file, (5) dumps of store controller storage, and (6) dumps of user program termination.

Finally, subsystem support services prints a completion report, listing the utility functions that were performed, noting any errors that were encountered.

For more detailed information on how to use subsystem support services, refer to the *IBM System/370 Subsystem Support Services User's Guide*.

## User Programming Support

The IBM 3650 Retail Store System is a combination of hardware, programming support, and communications facilities designed to function as an effective retail management system. The hub of this system is the store controller. Since the retail store system depends upon OS/VS or DOS/VS operating systems for its generation and maintenance, it is considered to be a subsystem. To aid the user in exercising control over the devices within the retail store system, application programming may be coded and implemented by and through the Subsystem Program Preparation Support (SPPS) provided by IBM.

SPPS is the user's program facility for the retail store system. SPPS functions in an IBM System/370 environment to create application object modules, which are then passed to IBM Subsystem Support Services (SSS), to be transmitted to a specific subsystem controller in the retail store system. SPPS is designed to create machine instructions for individual subsystem controllers. Retail store system definition and generation create a "subsystem" operational environment in which unique applications can be run. Programs written with SPPS can control some of the hardware devices, communicate with the host processor, and provide new applications that are not supplied by IBM.

There are three divisions within SPPS:

1. System/370 Basic Assembler Language Subset (BAL)

SPPS provides a 57-instruction subset of assembler language instructions from the IBM System/370 assembler at the host processor. These instructions are assembled at the host processor and are executed at the store controller. Arithmetic, logical, and branching instructions are included in the subset.

2. User Macros

SPPS provides instructions that are executed in the store controller. As with assembler instructions, they are first assembled at the host processor, then transmitted to the store controller for execution. The three categories of user macros are:

a. Program Structure Macros

These macros allow you to control the logical flow of a program. In addition to defining routines, they provide for decision making, iteration of code, and calling of external subroutines in such a manner that the entire program is structured logically and is, therefore, easy to read and code.

b. Program Control Macros

These macros provide such services as job initiation and resource allocation, program control during execution, and resources deallocation at the end of the job.

c. Input/Output Macros

These macros support input/output operation between the store controller and its peripheral devices, including the host processor.

3. Transformation Definition Language (TDL)

The Transformation Definition Language (TDL) aids in programming the 3275 Display Station. TDL includes data formatting, data editing, and data transfer capability between the 3275 and the store controller. TDL statements are translated in the host processor, using the TDL translator. Output records from the translation are transmitted to the store controller and are stored on the disk until the program is executed. The records are then accessed by the SPPS program and are used to format and control the 3275 Display Station.

The IBM Retail Store System provides the following basic functions for operating a retail store or group of stores:

- Security Support
- Administrative Support
- Credit Support
- Ticketing Support
- Sales Support

SPPS is a programming facility that enhances the functions provided by IBM and creates additional functions needed for a specific application.

Among the subsystem components that SPPS can control are:

- Integral Disk Storage
- 3275 Display Station
- Host Communications
- Input Data to the 3657 Ticket Unit
- 3653 Point of Sales Terminal
- 3767 Communication Terminal
- 7481 Data Storage Unit

User programs can be used in either a batch or an interactive environment. Examples of programs that might be used in a batch environment are:

- Staging the Transaction Log
- Register Balancing
- Applying Voids
- Generating Reports
- Updating Files

Examples of interactive applications using SPPS facilities include:

- Purchase Order Entry
- Receipts Data Entry
- Online File Maintenance
- Online File Inquiry

Interactive applications require operator-machine interactions. In the retail store system, this is provided through the 3275 Display Station, the 3653 Point of Sales Terminal, and the 3767 Communications Terminal. For detailed information on SPPS, refer to *IBM 3650 Subsystems Program Preparation Support—Programmer's Guide*.

In addition to the previously mentioned uses, SPPS provides the following functions. Each of these functions is discussed in the following paragraphs.

1. Checkpoint/Restart
2. Timer Facility for User Program
3. Start Batch Print from User Program
4. Make Store Identification Available to User Program
5. Test System Option Parameter

### ***Checkpoint/Restart for User Programs***

This feature enables the user to have his program restarted either automatically or on a "deferred" basis, following a power loss disturbance (PLD). It also permits user programs to recover disk sequential data set processing after being restarted.

This automatic restart/recovery facility gives the user program increased reliability for either online ("daytime") or stand-alone ("nighttime") processing of the retail sales transaction log. With this ability to defer a restart, a store manager may temporarily suspend processing of user programs. It allows a user program to be automatically restarted during an IML, following a PLD.

### ***Timer Facility for User Program***

This function provides a method by which a user program, executing in the store controller, can specify a time interval during which the program will be placed in a wait state. When the time interval expires, the user program execution continues.

### ***Starting Batch Print from User Program***

This function provides a method by which the user program can automatically initiate the fixed-function batch print program, thus eliminating the need for operator intervention to start the batch print function. The function also provides a method by which the user can specify the file from which the data is to be printed.

### ***Making Additional Data Available to User Programs***

At times there is a need to access information needed for store reports and maintenance of user files; this information maybe different on a store basis in a multi-store environment. This function provides a method by which the user can request one or more of the following:

1. The current date
2. A store identification
3. The program initiation message.

The store identification is provided to the user when he supplies a terminal address; the terminal address is related to the store address (identifier) with which it was associated during subsystem definition. The program initiation message provides the user with a means of telling how his program was initiated.

### ***Test System Option Parameter***

This function allows the user to designate a specific store controller to be used as a test system. The user can test the functions, options, and programs on the designated test system without affecting the operation of the other store controllers that are online with the host processor. The test system files and programs can be displayed, and alterations can be made, through a 3275 Display Station.

This function is defined at subsystem definition when the retail store's operational environment is described.

### ***Using the 3653 as an Input/Output Device***

This function permits the IBM 3653 Point of Sale Terminal, in conjunction with user SPPS programming, to be used as an input/output device. It can be used for new applications such as service and/or catalog desks. It may also be used by the user to "build" his own specialized terminal for back room applications, cashier use, or it may be used as a test terminal for new point of sale functions.

This function requires the 3653 to be in nonsales mode. Available input data sources include the keyboard, wand, cash drawer, and forms-sensing contacts at the document insertion station. Data is transmitted in the same format in which it was accepted; that is, no editing, checking, or other logical exercises are performed.

Data for the output may be sent to the printer, transaction display, and/or operator guidance panel. Printer capability includes the full 3653 character set, spacing control, and station selection. Transaction display positions and captions are controllable. Commands directed to the operator guidance panel may be used to turn lights on and off. Control operations may be used to sound the audible alarm or to open the cash drawer.



## ***Sequential Index Facility***

This function enables the user to reorganize a resident file into an ascending logical sequence. It may be used to index a file of records that contains data or record pointers. These record pointers may then be used to retrieve data files from the disk in the new sequence. Data such as flash items can be indexed by the quantity sold.

The file to be indexed must be contained within the working storage of the user's SPPS program. Requirements that must be considered in using this facility include record lengths, index keys, the number of records to be indexed, record locations, etc.

## ***Displaying Task Completion***

In Release 3.2, this improvement causes task completion codes to appear at the end of the associated store controller messages received at the 3653, 3275, and the 3767. These messages are the result of an abnormal termination (ABEND) of the session.

## ***User Program Exit When No Resources Are Available***

This Release 3.2 function prevents the user program from abnormally terminating (ABEND) when insufficient resources (buffers) are available. The program may wait and then retry the buffer request again.

## ***Reset Dump File Indicator***

This Release 3.2 function enables a store controller operator to reset the dump file bit by a panel command so that if a failure occurs, the dump overlays the previous dump area on the disk. This resetting of the dump file bit may also be done through user programming.

## **Host Access Method**

The host access method for communications between the host processor and the Store Controller is virtual telecommunications access method—VTAM. VTAM is supported by OS/VS1, OS/VS2, and DOS/VS.

In Release 3.2, bidirectional pacing is possible. In previous releases only outbound pacing (the flow of data from the host to the store controller) was controlled. Inbound pacing (controlling the flow of data from the store controller to the host) is possible in Release 3.2.

Inbound pacing is supported only by DOS/VS and requires ACF/VTAM and ACF/NCP. Inbound pacing should not be specified on the host positive authorization session or the host conversational sessions. Inbound pacing should be used only for HCP and user program sessions that can transmit large quantities of data back to the host.

*Note:* The information presented here is for planning purposes only, and is subject to change, pending notification of the function in the Retail 3.2 availability announcement.

## **IBM 3704 or 3705 Communications Controller**

To communicate with any terminal VTAM requires that the terminal be connected to a 3704 or 3705 operating in network control (NCP) mode.

## **Data Base/Data Communications**

If the retailer's programmers wish to write online application programs that execute at the host processor, they must provide the data base/data communications function. The virtual storage access method (VSAM) and Customer Information Control System (CICS) can be used to help them provide this function.

## Chapter 11. System Configuration

The IBM 3650 Retail Store System has four levels of operation. The first level is at the IBM System/370 host processor, the second level at the IBM 3704 or 3705 Communications Controller, the third level at the store controller, and the fourth level at the terminals connected to the store controller (see Figure 11-1). The host processor and the store controller are linked by synchronous data link control (SDLC). The terminals are tied to the store controller by a store loop, also using synchronous line control. The *store loop* is cable running from the store controller (or 3659) to terminals, connected serially throughout the store (or stores and warehouses) and returning to the store controller (or 3659). (See Figures 11-2 through 11-4.)

### Host Processor

The host processor can be any System/370 relocate model supported by OS/VS1, OS/VS2, or DOS/VS. The System/370 operates with synchronous line control, through an IBM 3704 or 3705 Communications Controller. Modems connected to the communications lines are the IBM 3872 and the IBM 3874.

The data formats between the store controller and the host processor are EBCDIC and transparent text formats. Standard EBCDIC formats are used for data originating at, or destined to go to, IBM 3275 Model 3 Display Stations. Data originating at, or destined to go to, the IBM 3653 Point of Sale Terminals, as well as programs transmitted by the host processor to the store controller, are transparent text.

### Communications Controller

Duplex private line, nonswitched, multipoint communications facilities may be used for multipoint attachment of several store controllers to either an IBM 3704 or 3705 Communications Controller. Either nonswitched, private line, communications facilities or switched communications networks may be used for point-to-point attachment. For information about the 3704 and 3705, see the *Introduction to the IBM 3704 and 3705 Communications Controller*.

The Synchronous Clock feature on the store controller allows cable connection (maximum of 100 cable feet/30 m) to an IBM 3704 or 3705 Communications Controller without requiring modems or communications facilities. (Refer to Figure 11-1.)

### Modems

The following IBM modems are available for use with the Retail Store System:

**IBM 3872 Modem** - Used for leased private line and switched network communications between the host processor and the store controller, at 2400 bits per second. The IBM 3872 Modem is also used for communications between the store controller and the IBM 3659 Remote Communications Units on a remote loop, at 2400 bits per second.

**IBM 3874 Modem** - Used for leased private line communications between the host processor and the store controller, at 4800 bits per second.

### IBM 3659 Remote Communications Units

The IBM 3659 Remote Communications Unit is available in two models: the 3659-1, for a remote store loop connected to the store controller in a point-to-point configuration, and the 3659-2, for a remote store loop connected in a multipoint configuration.

A remote communications unit is used at each remote location that is connected to a remote store loop. See Figure 11-1. Using these units permits terminals at a maximum of three remote locations (with 3659-1s) or 12 remote locations (with 3659-2s) to require the use of only one remote store loop driver at a store controller.

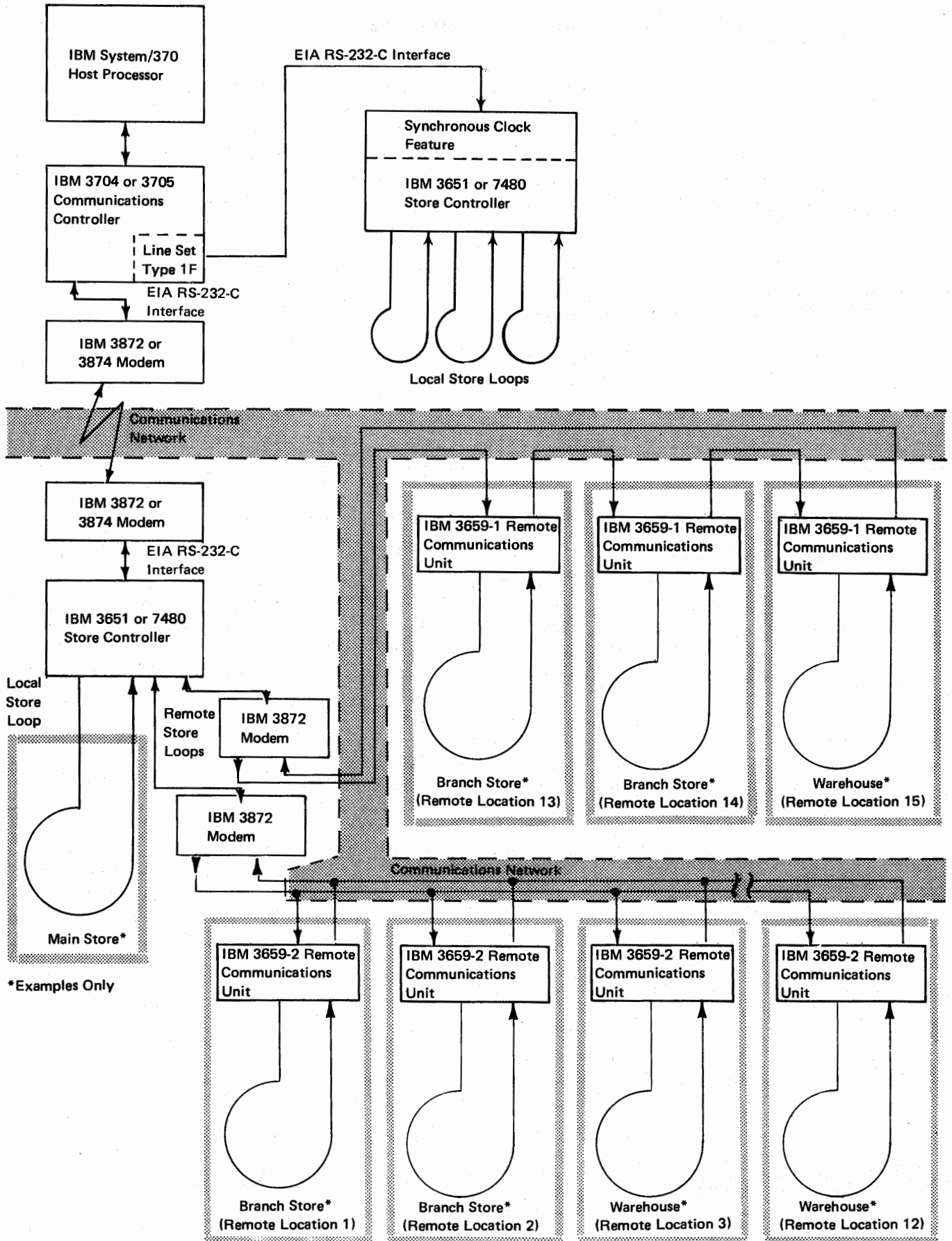
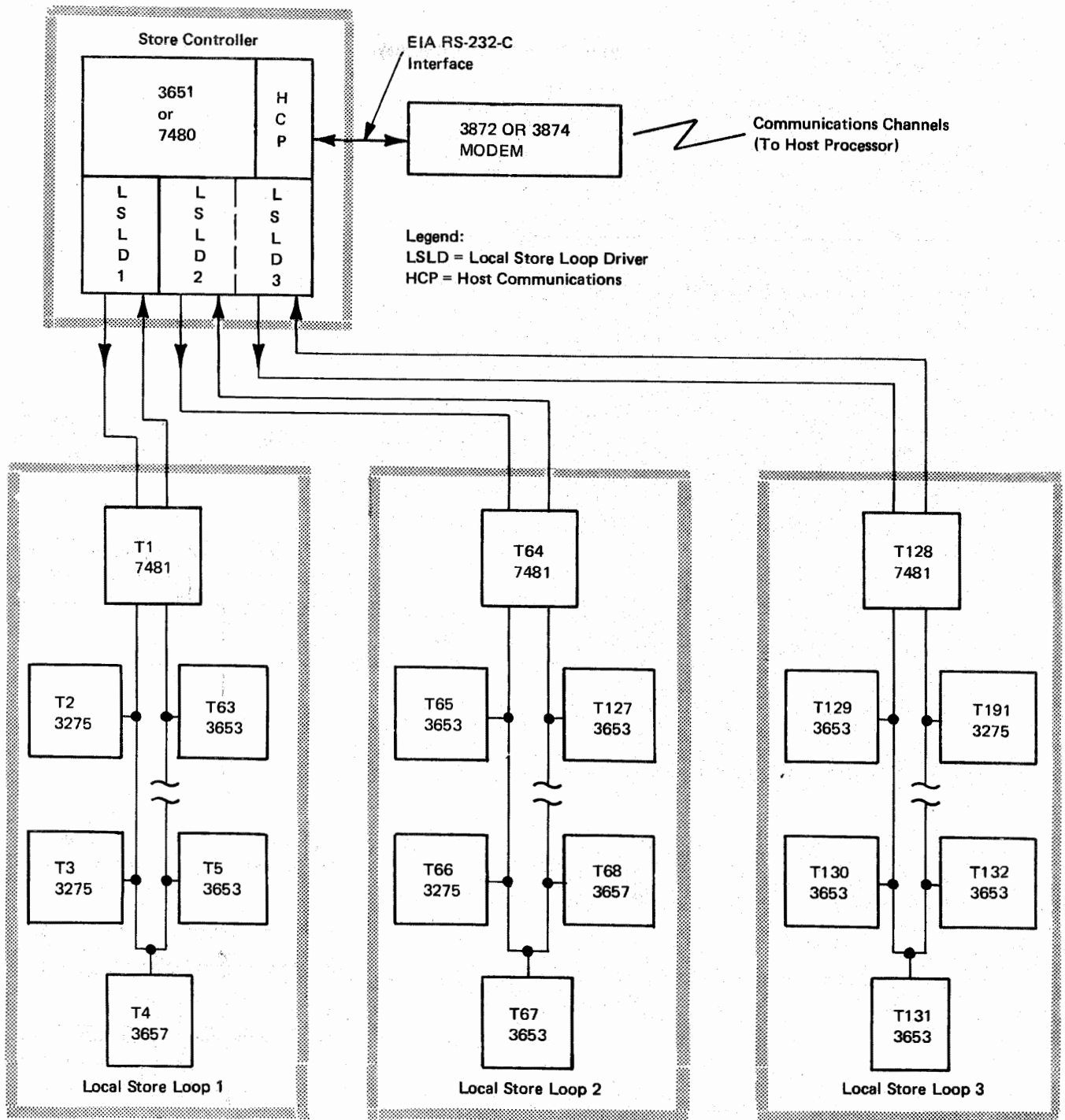


Figure 11-1. Retail Store Loop Configuration



**Notes:**

- Maximum number of loops on a store controller = 3
- Maximum number of terminals on local store loop 1 (including 7481s) = 63
- Maximum number of terminals on local store loop 2 or 3 (including 7481s) = 64
- Total number of terminals (including 7481s) on a store controller = 191
- Any T (terminal) position can be occupied by any terminal type, except when the 9600 bps Transmission Speed special feature is present. This feature is available on either local store loop 2 or 3, but not on both. IBM 3275 Model 3 Display Stations and IBM 7481 Data Storage Unit only, can be attached to the 9600 bps loop. The 9600 bps Transmission Speed special feature is not available on local store loop 1.

Figure 11-2. Local Store Loop Configuration

# IBM 3651 Model A50 or B50 Store Controller and IBM 7480 Model 1 (RPQ EG3129) or Model 2 (RPQ EG3130) Store Controller

The store controller has one standard local store loop. By combining this with the second or third local store loop or the remote store loop or combinations thereof, the store controller can be configured as follows.

## ***Local Store Loop***

Local store loop configurations shown in Figure 11-3 allow the attachment of point of sale terminals, display stations, communication terminals, data storage units, and ticket units to the store controller. The maximum number of store loops on a store controller is three. The maximum addressing capability of store loop 1 is 63 terminals and of store loops 2 and 3, 64 terminals each. The actual number of terminals on a store loop depends upon traffic rates and the required response times.

## ***Remote Store Loops***

Each remote store loop (see Figures 11-4 and 11-5) provides the addressing capability for up to 64 terminals, at remote locations. Each remote store loop special feature removes the capability of supporting one local store loop feature. With two local store loops, only one remote store loop can be installed. If two remote store loops are installed, only the standard local store loop can be installed.

A private-line communications facility is required to connect the store controller to the remote locations. (See *IBM 3650 Retail Store System Installation Manual - Physical Planning*, GA27-3074, for specifications of communications facilities.) An IBM 3872 Modem is used to connect the store controller to the private-line communications facility. At the remote location, the 3659 connects the communications facility to the store loop. The 3659 accepts the 2400-bits-per-second signals from the communications facility and converts them to the store loop signals. Thus, the 3659 drives the remote store loop with the same type signals provided for the local store loop(s) by the Local Store feature(s) at the store controller.

The 3659s are available in two models, to allow connection of the remote locations to the communications facilities, either in a point-to-point (series) configuration or a multipoint (parallel) configurations.

## ***Point-to-Point (Series) Configuration***

The 3659 Model 1 Remote Communications Units are used at up to three locations connected to a store controller, via a 3872 Modem and point-to-point communications facilities, in a series configuration (Figure 11-3). A maximum of two remote store loops are supported. If the store controller has two remote store loops, and if both of them are connected in a series configuration, the configuration is limited to a maximum of six remote locations (in addition to the one standard local store).

When the remote store locations are connected to a remote store loop in a series configuration, a half-duplex, point-to-point, private-line communications channel is required: (1) between the store controller and the 3659 at the first store location, (2) between the store controller and the 3659 at the last store location, and (3) between the 3659s at up to three remote store locations. When only one remote store location is connected to the remote store loop, a duplex point-to-point communication channel is required between the store controller and that remote location. The 3872 at the store controller must have the Point-to-Point feature installed, for both of these configurations.

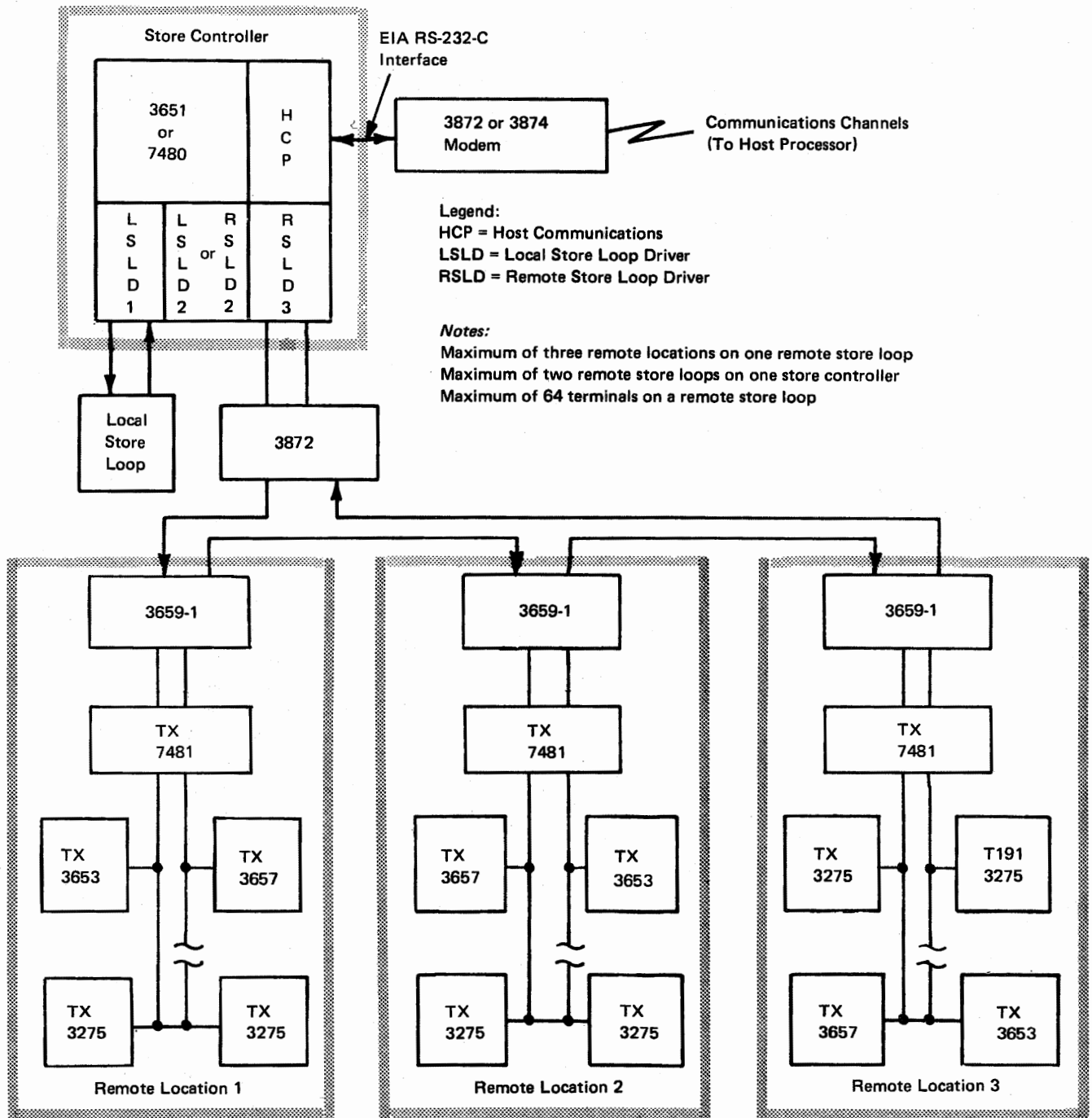


Figure 11-3. Remote Store Loop in a Point-to-Point (Series) Configuration

### ***Multipoint (Parallel) Configuration***

The 3659 Model 2 Remote Communications Units are used at up to 12 remote locations that are connected to a store controller, via a 3872 Modem (master station) and communications facilities, in a multipoint configuration. If two remote store loops are used in a multipoint configuration, the retail store system is limited to a maximum of 24 remote locations (in addition to the one standard local store).

A duplex, private-line, multipoint communications channel is required to connect the store controller to the remote store loop in a multipoint configuration. The 3872 Modem ordered for this configuration must be specified for use as a multipoint master station. (A 3872 Modem having point-to-point capability can be field-converted to have multipoint capability, and vice versa.)

Since the 3659-2s are connected in parallel (Figure 11-4) to the private-line communications channel, the operation of each 3659-2 and its associated remote loop (segment) is usually independent of other 3659-2s on the same remote store loop and communications channel. A failure at an individual store location, or in its specific communications channel normally does not affect the operation of the other locations on the same store loop.

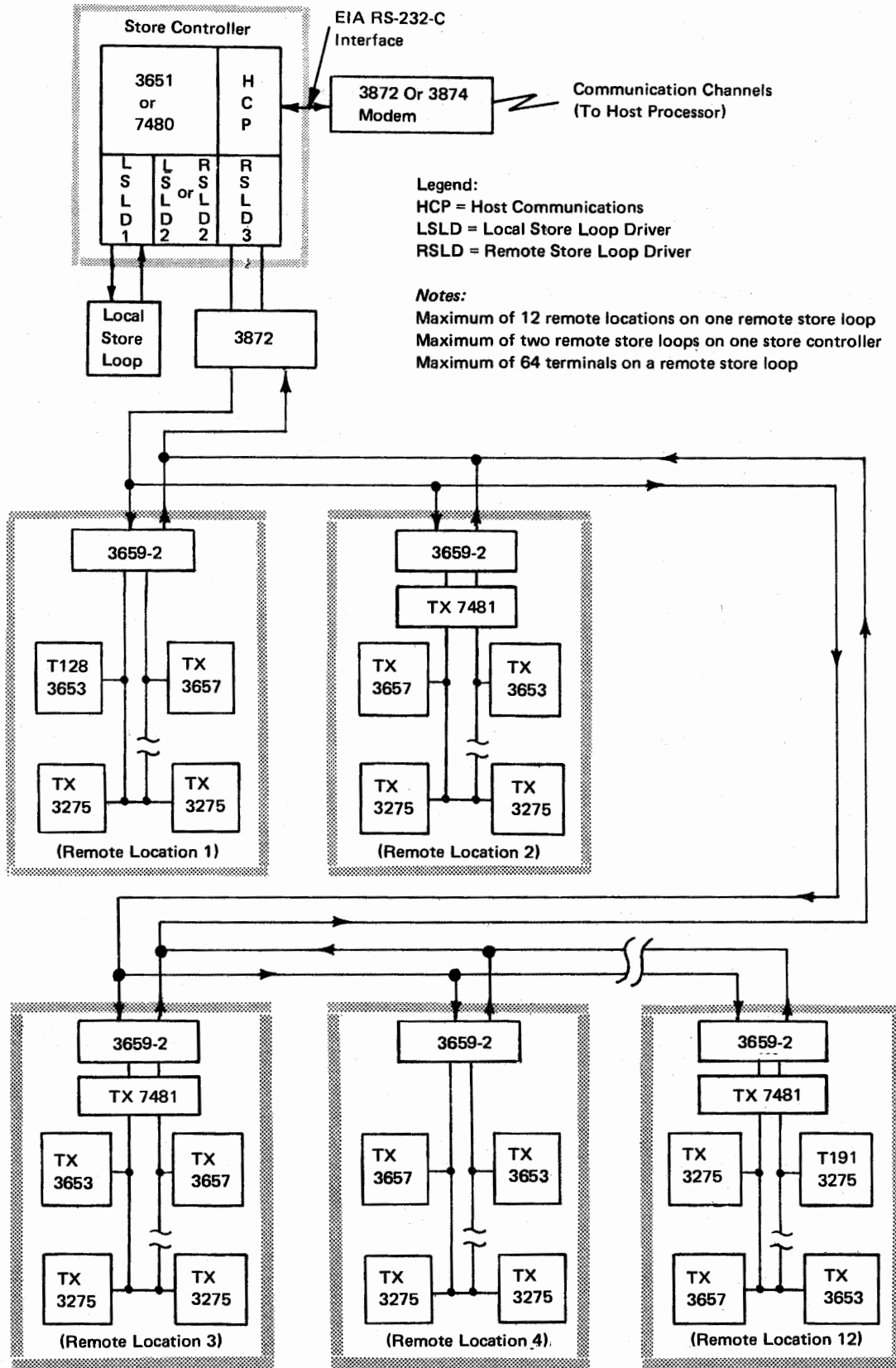


Figure 11-4. Remote Store Loop in a Multipoint (Parallel) Configuration





## Chapter 12. Security

The IBM 3650 Retail Store System helps prevent unauthorized access to, and modification of, system data by controlling the use of the store controller and system terminals. When the system is in operation, it verifies the identity of the source of any request for data or of any request to modify data from any 3653 Point of Sale Terminal, 3275 Model 3 Display Station, or 3767 Model 2 Communication Terminal. The requestor's identity is verified against system control data before the requested operation is allowed to continue. The requestor identification, time, date of request, and data requested may be recorded, for later retrieval, by a user audit program.

The following paragraphs summarize the security measures available for the IBM 3653 Point of Sale Terminal, the IBM 3275 Model 3 Display Station, the IBM 3767 Model 2 Communication Terminal, IBM 7481 Data Storage Unit and the retail store system.

### Point of Sale Terminal

The point of sale terminal, because of its location on the sales floor, offers access to the largest number of people and thus has more exposure to unauthorized access to data stored in the terminal, store controller, and host processor. The following safeguards are available for security purposes:

- The on/off switch is under the access panel.
- A key is required to control access to the journal tape. The keylock on the journal station is a special feature.
- Functions and requests for data may require specific operator identification numbers.
- Security codes may be required, optionally, to obtain specific functions and data.
- A modulo check may be performed, optionally, on the operator identification number.
- The user may choose to restrict entry of operator identification to the optional Wand Reader feature.
- A three-position lock on the cash drawer ensures that unauthorized persons do not have access to the cash drawer and keyboard.
- The printing of the journal roll totals may be masked at the option of the user.
- The display and printing of the authorization and security codes can be suppressed at the option of the user.

### 3767 Model 2 Communication Terminal

The 3767 is used for inquiry and data entry, and for the printing of store reports. It can be protected from unauthorized use in the following ways:

- Functions and requests for data may require a specific operator identification number.
- Entry of an operator security code may be required.
- A keylock feature may be installed.

### 3275 Model 3 Display Station

The 3275 Model 3 is used for inquiry to a data base. Security against unauthorized use is provided in three ways:

- Functions and requests for data may require a specific operator identification number.
- Entry of an operator security code may be required.
- A keylock feature may be installed.

### 7481 Data Storage Unit

A security keylock protects the tape cartridge against access while the cartridge is in the 7481.

## Retail Store System

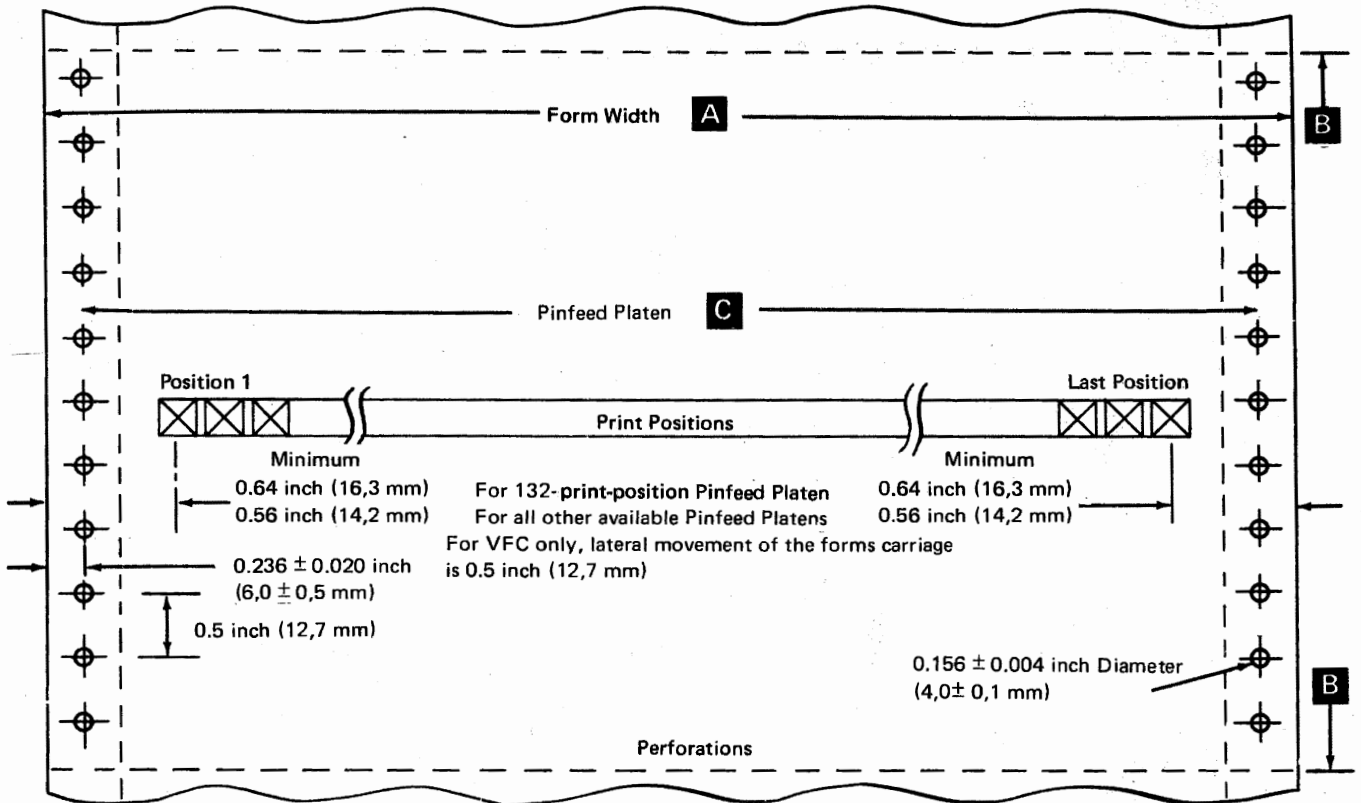
In addition to these security measures, the following security precautions are used by the retail store system:

- For nonsales functions, an operator identification may be validated against a table of valid operator numbers maintained at the store controller.
- Some or all secured files and basic functions may be available optionally to selected operators on a “need to know” basis only.
- Operator security codes may be changed, as necessary, to maintain the security of the system.
- Selective logging of security checking is an option available at system definition.

# Appendix A. Expendable Supply Specifications

## IBM 3284 Model 3 Printer

### Form Specifications



	Maximum	Minimum
<b>A</b> Form Width	15 inches (381,0 mm) Friction Feed 14 7/8 inches (377,8 mm) VFC Pinfeed Platen—See <b>C</b>	--- 3 inches (76,2 mm) 5 3/4 inches (146,1 mm)
<b>B</b> Form Length	14 inches (355,6 mm) 6 lines per inch 11 inches (279,4 mm) 8 lines per inch	3 inches (76,2 mm)
<b>C</b> Pinfeed Platens (not recommended for forms having more than three parts)		

120 Print Positions: 13 inches (330,2 mm); 12 1/2 inches (317,5 mm) hole-to-hole  
 126 Print Positions: 13 5/8 inches (346,1 mm); 13 1/8 inches (333,4 mm) hole-to-hole  
 132 Print Positions: 14 3/8 inches (365,1 mm); 13 7/8 inches (352,4 mm) hole-to-hole

Multiple Copies:  
 Thickness 0.018 inch (0,46 mm) maximum  
 with vertical forms control 0.025 inch (0,64 mm) maximum  
 Front form must be a full-width form.  
 No hard fasteners

Single-ply roll paper-up to 15 inches (381,0 mm) width:  
 Outside diameter 4 inches (101,6 mm)  
 Inside diameter 0.375 inch (9,5 mm)

Figure A-1. IBM 3284 Model 3 Form Specifications

### Ribbon Cartridge

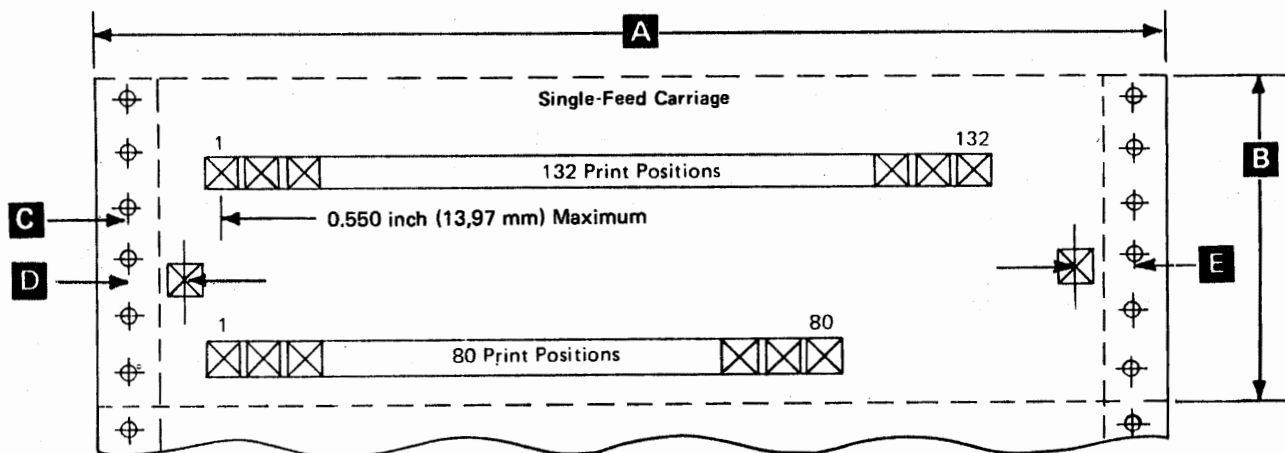
Use IBM ribbon (P/N 1136970) or its equivalent.

# IBM 3784 Model 1 Line Printer

## Ribbon Cartridge

Use IBM ribbon (P/N 1136634) or its equivalent.

## Form Specifications



	Maximum	Minimum
<b>A</b> Form Width	15 inches (381 mm) See Note 6.	3.5 inches (88,9 mm)
<b>B</b> Form Length	14 inches (355,6 mm)	3.0 inches (76,2 mm)

Carriage Spacing — 6 lines per inch

**C** The maximum distance from the center line of the left margin hole and center line of print position number one is 0.550 inch (13,97 mm) with the left tractor in leftmost position.

### Forms With Tear Strips

**D** The distance between the center line of a margin hole and the center line of the first available print position is:  
 0.375 inch (9,53 mm) minimum with odd print position and  
 0.475 inch (12,07 mm) minimum with even print position.

**E** The distance between the center line of a margin hole and center line of the last available print position is:  
 0.375 inch (9,53 mm) minimum with even print position and  
 0.475 inch (12,07 mm) minimum with odd print position.

### Forms Without Tear Strips

**D** The distance between the center line of a margin hole and the center line of the first available print position is:  
 0.150 inch (3,81 mm) minimum with odd print position and  
 0.250 inch (6,35 mm) minimum with even print position.

**E** The distance between the center line of a margin hole and the center line of the last available print position is:  
 0.150 inch (3,81 mm) minimum with even print position and  
 0.150 inch (6,35 mm) minimum with odd print position.

### NOTES:

- Up to 6-part forms can be used; maximum thickness not to exceed 0.020 inch (0,51 mm).
- Continuous card stock forms are not recommended.
- No hard or metallic fasteners are permitted.
- Fastening multiple set forms on both edges is recommended.
- Feed holes should remain free of chads and crimps to avoid false form jam checks.
- Recommended that no printing occur within 0.166 inch (4,22 mm) of the horizontal perforation.
- Leaders for alignment of prenumbered documents are recommended.
- Test forms legibility and feeding performance first before choosing paper quality and thickness of forms to be used.
- When using dual-feed carriage, the maximum difference of form thickness between the left and right carriage cannot be more than 0.006 inch (0,15 mm).
- Left tractor must be in the leftmost position when using maximum form width.

Figure A-2. IBM 3784 Model 1 Form Specifications

## IBM 3653 Point of Sale Terminal

### Ribbon Cartridge

Use IBM ribbon (P/N 1136970) or its equivalent for machines installed prior to June 1975. Use IBM ribbon (P/N 1136660) or its equivalent for machines installed in June 1975 or later.

### Roll Paper

The roll paper for the 3653 printer must meet the following conditions:

Width	2.75 + 0.02 or -0.03 inch (69,9 + 0,5 or -0,7 mm)
Outside diameter	3.20 inches (81,3 mm) maximum <i>Note:</i> Roll diameters smaller than the 3.20 inches (81,3 mm) maximum may be used; in some cases, these may be more readily available and at a lower cost.
Thickness	0.002 to 0.004 inch (0,05 to 0,10 mm)
Weight	15-pound (6,8-Kg) minimum 16-pound (7,3-Kg) maximum
Grade	Service or high grade (economy or bond)
Attachment	The inner end of the roll must be secured by a reverse tuck start. <i>Paper must not be attached to the core in any manner.</i>
Splices	There must be no splices within the paper roll.
Marking	There must be dye stripes on the paper beginning $48 \pm 6$ inches ( $122 \pm 15$ cm) from the inner end of the roll and extending to within 12 inches (30 cm) of the end of the roll.
Core	Core material is optional. The center hole is $0.44 + 0.06$ or $-0$ inch ( $11,11 + 1,59$ or $-0$ mm) diameter. The core is not to protrude beyond the paper on either side.

### Document Insertions

Document insertions for single-part and multipart forms must meet the following conditions.

#### CAUTION

No staples or metal inserts may be used on any area of the forms that are inserted in the printer. Side stitching and/or side stubs on forms sets cannot be inserted in the printer.

### All Forms

All forms used for insertion in the document insertion station must be designed with an alignment line  $0.77 \pm 0.01$  inches ( $19,4 \pm 0,24$  mm) above the bottom of the first print line to provide the operator with the correct form location.

### Single-Part Forms

Paper Size	8.5 by 13 inches (216 x 330 mm) maximum, recommended 2.75 by 6 inches (69,9 by 152,4 mm) minimum, recommended
Tab card size	3.25 by 7.375 inches (82,5 by 187,7 mm) inches
Weight	15- to 24-pound (6,8 to 9,1 Kg) paper or tab card stock
Thickness	0.003 inch (0,0076 mm) paper to 0.008 inch (0,02 mm), maximum, ledger card stock (uncoated card stock only)

## Multi-Part Forms

Multi-part form sets may be used in the document insert station. This station is designed for top or left side document entry only. Bottom stitching on forms 5 inches by 7 inches or larger is required. On other size forms the stitching may be at the top, bottom, or left side. When stitching is on the bottom, it must not extend more than 3/4 inch from the bottom edge of the document. See Figure A-3 for complete specifications for multi-part forms.

## Transaction Display Lamps and Operator Guidance Panel Lamps

Use IBM lamp part number 2410085, General Electric lamp part number 7378, or equivalent.

Parts (Plies) in Form Set Including carbon(s)	Stock Type	Max. Number of Parts of each Stock Type per Form Set	Stock Weight (lbs.)	Stock Weight Basis-Sheet Size in inches	Max. Thickness per Stock ply (inches)	Grade of Stock
3	Paper	1 or 2	10 or 12	17 x 22 (500)	0.0025	Reg. Bond***  One time
	Card*	1 only	99	24 x 36 (500)	0.0075	
	Tag*	1 only	100	24 x 36 (500)	0.0075	
	Carbon	1	8	20 x 30 (500)	0.0020	
5	Tag	1 only **	80	17 x 22 (500)	0.0075	Reg. Bond Reg. Bond One time
	Paper	1 only	12 to 16	17 x 22 (500)	0.0035	
	Paper	2	10 to 12	17 x 22 (500)	0.0025	
	Carbon	2	8	20 x 30 (500)	0.002	
7	Paper	1	12 or 16	17 x 22 (500)	0.0035	Reg. Bond Reg. Bond One time
	Paper	3	10 or 12	17 x 22 (500)	0.0025	
	Carbon	3	8	20 x 30 (500)	0.0020	
7	Tag	1	80 (bottom copy only)	17 x 22 (500)	0.0074	Reg. Bond Reg. Bond One time
	Paper	3	10 or 12	17 x 22 (500)	0.0025	
	Carbon	3	5-1/2	20 x 30 (500)	0.0012	
9	Paper	1	12	17 x 22 (500)	0.0025	Reg. Bond Reg. Bond One time
	Paper	4	10	17 x 22 (500)	0.0020	
	Carbon	4	6-1/2	20 x 30 (500)	0.0018	
11	Paper	1	10 or 12	17 x 22 (500)	0.0025	Reg. Bond Reg. Bond One time
	Paper	5	10	17 x 22 (500)	0.0020	
	Carbon	5	5-1/2	20 x 30 (500)	0.0012	

\* Card or tag stock may be top or bottom copy and only one ply of either type may be used per form set.

\*\* Bottom copy only.

\*\*\* Regular bond is equivalent to No. 4 Sulfite.

Size—minimum 3.25 by 5.5 inches (8,3 by 14 cm)  
maximum 8.50 by 13 inches (21,6 by 33 cm)

Length — Any document over 8.5 inches (21,6 cm) long must be inserted vertically.

Thickness — maximum thickness for any form set is 0.0185 inch (0,47 mm)

Figure A-3. Form Specifications for Insert Station Multi-Part Documents

## ***Battery for 3653 Totals and Transaction Counter Retention***

The battery used in the 3653, for this feature, is IBM part number 1647914, or commercial supplier's part number TR134R Mallory, or equivalent.

## **IBM 3657 Ticket Unit**

### ***Ribbon Cartridge***

Use IBM ribbon (P/N 1136662) or its equivalent.

### ***Ticket Stock***

Three sizes of tickets: 1-inch long, (0.94" x 0.94" usable area) self-adhering labels and 1-, 2- and 3-inch tags in 1-inch widths, are available from IBM. Tall ticket and print-only ticket stock may also be obtained from IBM.

Two types of self-adhering labels are available:

- (1) **Permanent standard**—This label becomes extremely difficult to remove, within a few hours after it has been applied to a merchandise item.
- (2) **Permanent destructible**—The permanent destructible label is a security-type label that normally cannot be removed intact, once it has been applied and allowed to cure on the merchandise for a short period of time.

The labels are of a paper and adhesive similar to those widely used in retail applications. Adhesion of labels to merchandise will vary, depending on the cleanliness of, and the type of surface to which they are applied.

The tags are made from a quality tag stock similar to that normally used in retail applications.

The IBM ticket stock is available in white and various tinted colors, with custom logos and special preprinted format layouts. See your IBM Information Records Division (IRD) sales representative for the design of the tag or label best suited for your application and compatibility with the 3657 Ticket Unit.

## **IBM 3767 Communication Terminal**

### ***Printer Ribbon***

Use IBM ribbon part number 1136653, or its equivalent.

### ***Paper***

Either roll paper or continuous forms may be used, depending upon the options (features) selected by the user of the 3767-2. The specifications are:

#### **Roll Paper**

Maximum paper width	15 inches (381 mm)
Maximum roll diameter	5.5 inches (139,7 mm)
Minimum spool inside diameter	0.40 inches (10,2 mm)
Paper weight	16 to 20 pounds (7,3 to 9,1 kg)
Basis	500 sheets, 17 by 22 inches (431,8 x 558,8 mm)

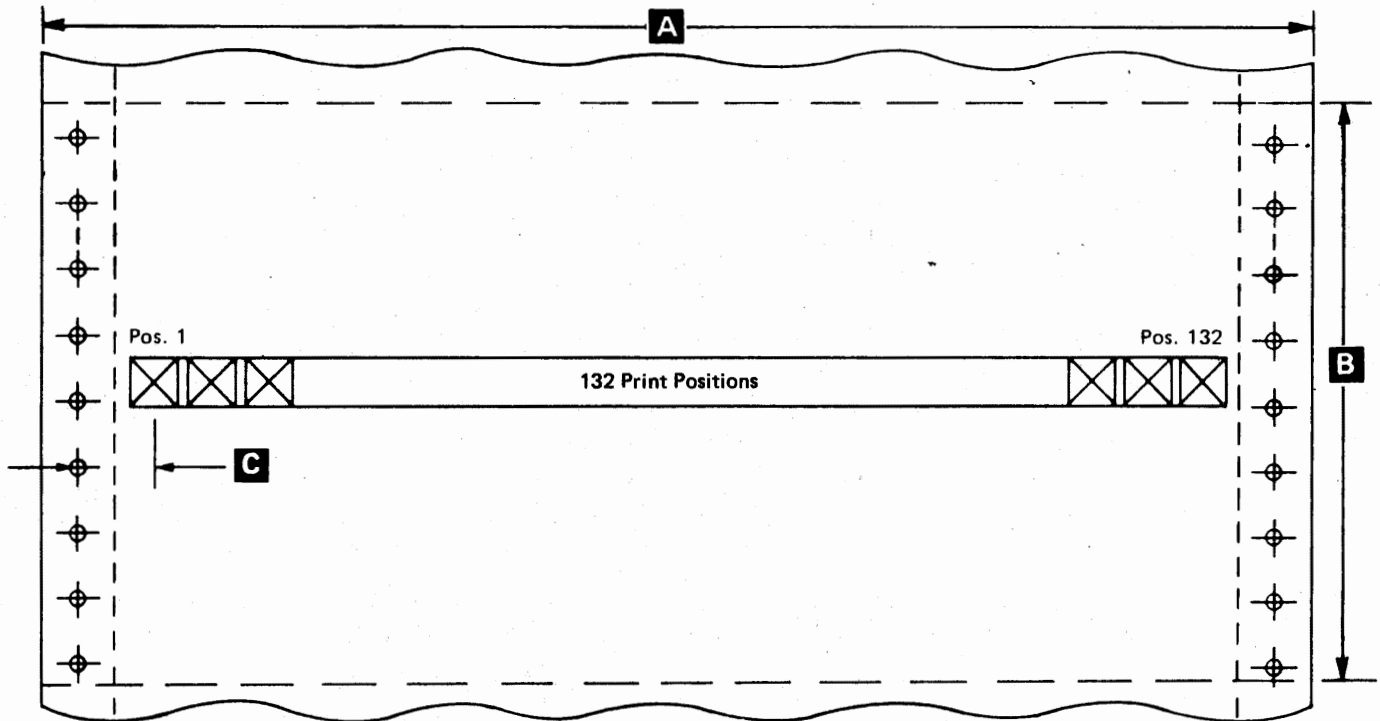
#### **Continuous Forms (Figure A-4)**

Marginally punched, fanfolded forms (up to six-part) may be used.

*Note:* Five-part and six-part forms should be tried before ordering them in quantities.

Width 15 inches (381 mm) maximum





	Maximum	Minimum
<b>A</b> Form Width	15 inches (381 mm)	3 inches (76,2 mm)

Note: The 3 inches (7,6 mm) minimum applies to a form width of 14.875 inches (377,83 mm) or less.

<b>B</b> Form Length	14 inches (355,6 mm)	3 inches (76,2 mm)
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<b>C</b> First print position	0.50 inch (12,7 mm) maximum, 0.30 inch (7,6 mm) minimum.
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The minimum distance for 15 inches (381 mm) forms is 0.425 inch (10,8 mm).

Notes:

1. Continuous card stock forms are generally not recommended.
2. Staples are not permitted.
3. For best results, multiple-part continuous forms should be glued together.
4. Multiple-part cut forms (form sets) must be glued together at the top.
5. The left edge of a cut form is 0.25 inch (6,4 mm) from the first print position.
6. Partial forms separation is not permitted.
7. Crimped multiple-part cut forms are not recommended because they tend to separate when wrapped around the platen.
8. Carbon or self-contained carbonless (ink-impregnated) forms are recommended for multiple-part continuous forms.
9. Using the forms tractor is recommended for feeding all edge-punched continuous forms.
10. Continuous single-part forms can be fed through the pressure-feed mechanism if the feeding paths are clear and the forms are kept straight. However, forms that are not kept straight will require periodic operator adjustment of the forms.
11. The maximum forms thickness is 0.018 inch (0,46 mm).
12. Forms should be wide enough so that the print head is not required to travel beyond the edges of the form.

Figure A-4. IBM 3767 Model 2 Form Specifications

# IBM 7481 Data Storage Unit

## *Panel Indicator Lamps*

Use IBM lamp part number 5362325, or equivalent.

## *Tape Cassette*

| IBM IRD part number 1608498 |

| *Note:* The data density and data format are not the same for tapes used on the 7481 as they are for tapes on other IBM devices that use an identical type of tape cartridge. Therefore, do *not* exchange tape cartridges between the 7481 and other IBM devices. Data recording is not compatible.

Minimum requirements for the magnetic and mechanical specifications of the data cartridge are described in the proposed ANSI Specification X3B5/75-43, *Unrecorded Magnetic Tape Cartridge for Information Interchange*, with the following changes:

### Section 3.2 "Operating Environment"

Temperature	41° to 130°F (5° to 54.4°C)
Relative Humidity	8 to 80% noncondensing
Max. wet bulb temp.	80°F (26.7°C)

### Section 3.3 "Transportation Environment"

Temperature	-40° to 140°F (-40° to 60°C)
Relative Humidity	5 to 100%
Max. wet bulb temp.	85°F (29.4°C)



## Appendix B. Design Considerations for Insert Station Documents

The information in this appendix should be used as a guide when designing insert station documents (such as sales checks, refund checks, etc.) for the IBM 3653 Point of Sale Terminal. See Appendix A for form specifications for insert station documents.

### Programming Considerations

See *IBM 3650 Retail Store System Programmer's Guide* for details of programming considerations for the printing, spacing, field size, etc., required on various types of sales checks.

### Print Spacing

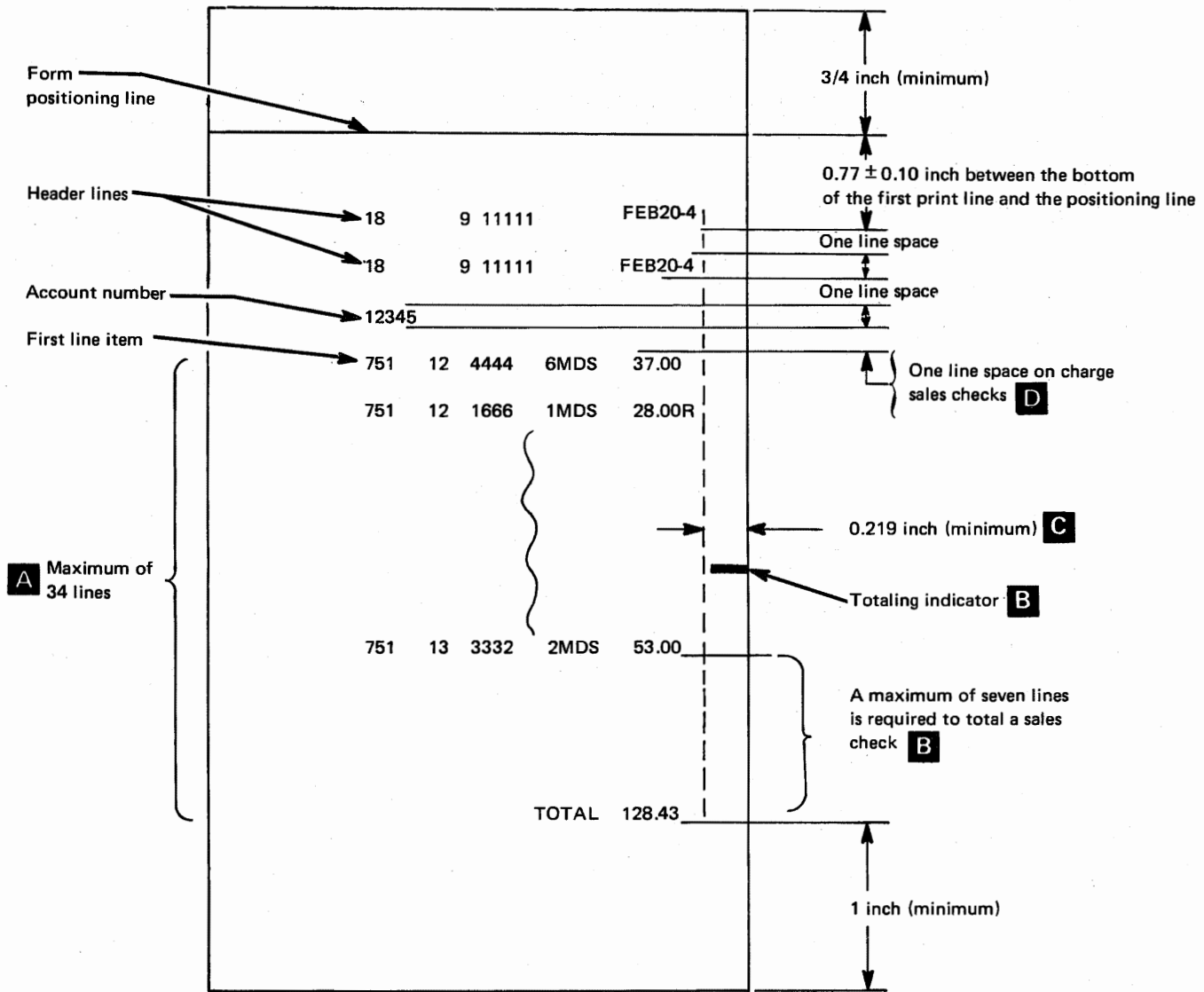
Print spacing should be as follows:

Horizontal character spacing = 12 characters per inch (25,4 mm)

Vertical line spacing = 5 lines per inch (25,4 mm)

Maximum number of characters per line = 30

See Figure B-1 for an example of sales check design.



- A** A maximum of 34 lines can be printed in the "body" of the sales check (not including header lines or the account number line).
- B** A maximum of seven print lines may be required to total a sales check after the last line item, including lines for the identification of the original salesperson (in the case of returned merchandise), fee (in the case of COD or layaway transactions), subtotal, tax, deposit, blank line, and the total. A totaling indicator must be pre-printed nine print lines above the last print line on the form, to inform the salesperson that no more line items can be entered and that the sales check must be totaled. (When the continuous sales check function is selected, the totaling indicator can be ignored or deleted from the form.)
- C** Printing should stop at a minimum of 0.219 inches from the right edge of the form. The last allowable print space for a line item should be reserved for the codes for "return", "void", and "minus".
- D** Although the account number is not used on a cash, COD, or layaway sales check, line spacing takes place just as if it were used. This results in three blank line spaces between the second header line and the first line item, on these types of sales checks.

Figure B-1. Example of Sales Check Design

## Appendix C. 3784 Character Sets

Figure C-1 shows the printable EBCDIC characters for the various character sets available for the 3784 Line Printer. The international character set is available for all World Trade countries. For a particular country, substitute the characters shown opposite that country for those shown in the international set. Where no difference is shown, the printable characters are the same as those shown for the international set.

The 3784 Line Printer can have either a 48-, 64-, or 94-character print belt. Characters in the print data that are not present on the print belt will cause a hyphen (-) to print.

The Katakana special feature character set is shown in Figure C-2 and is used with a 128-character print belt.

### 48-Character Set

Hex	4B	4E	50	5B	5C	60	61	6B	6C	7B	7C	7D	C1-E9	F0-F9
U.S. and Canada	.	+	&	\$	*	-	/	,	%	#	@	'	A-Z	0-9
International	.	+	&	\$	*	-	/	,	%	#	@	'	A-Z	0-9
Austria/Germany				Ü						Ä	Ö			
Belgium												à		
Brazil				Ç						Õ	Ã			
Denmark/Norway				Å						Æ	Ø			
Finland/Sweden				Å						Ä	Ö			
France										É	à			
Italy										È	Š			
Japan				¥										
Portugal										Ã	Õ			
Spain				£						Ñ				
Spanish-Speaking										Ñ				
United Kingdom										£				

Figure C-1 (Part 1 of 3). EBCDIC Printable Characters

64-Character Set

Hex	4A	4B	4C	4D	4E	4F	50	5A	5B	5C	5D	5E	5F	60	61	6B	6C	6D	6E	6F	79*	7A	7B	7C	7D	7E	7F	C1-D9	E0	E2-E9	F0-F9
U.S. and Canada	¢	•	<	(	+		&	!	\$	*	)	;	¬	-	/	,	%	_	>	?	'	:	=	@	'	=	"	A-R	\	S-Z	0-9
International		•	<	(	+	!	&	] \$ *	) ;	^	-	/	,	%	_	>	?	'	:	=	@	'	=	"	A-R	\	S-Z	0-9			
Austria/Germany	=							\$	Ü			¬											Ä	Ö					\$		
Belgium																								à					ç		
Brazil	É							\$	Ç													ã	õ	ã							
Denmark/Norway	=						Å				¬												Æ	Ø							
Finland/Sweden	\$						Å				¬											ë	Ä	Ö				É			
France	°							\$															E	à					ç		
Italy	°							é														ù	E	§					ç		
Japan	£						¥				¬																		\$		
Portugal			ç																					ã	õ				ç		
Spain								£			¬													ñ							
Spanish-Speaking											¬													ñ							
United Kingdom											¬													E							

\*The 3521 with Card Print feature cannot print the hex '79' character.

Figure C-1 (Part 2 of 3). EBCDIC Printable Characters

94-Character Set

Hex	4A	4B	4C	4D	4E	4F	50	5A	5B	5C	5D	5E	5F	60	61	6A	6B	6C	6D	6E	6F	79	7A	7B	7C	7D	7E	7F	81-89	91-99	A1	A2-A9	C0	C1-C9	D0	D1-D9	E0	E2-E9	F0-F9
U.S. and Canada	¢	•	<	(	+		&	!	\$	*	)	;	¬	-	/	,	%	_	>	?	'	:	#	@	'	=	"	a-r	~	s-z	}	A-I	}	J-R	\	S-Z	0-9		
International	[	•	<	(	+	!	&	] \$ *	) ;	^	-	/	,	%	_	>	?	'	:	#	@	'	=	"	a-r	~	s-z	}	A-I	}	J-R	\	S-Z	0-9					
Austria/Germany	#							\$	Ü			¬				ö								Ä	Ö				B		ä		ü		\$				
Belgium																	û								à			..	ë		ë		ç						
Brazil	É							\$	Ç								ç						ã	õ	ã					õ		ë							
Denmark/Norway	#						Å				¬						ø							Æ	Ø				ü		æ		å						
Finland/Sweden	\$						Å				¬						ö							ë	Ä	Ö				ü		ä		å		É			
France	°							\$									ù								E	à			..	ë		ë		ç					
Italy	°							é									ò								E	§				ì		à		è		ç			
Japan	£						¥				¬																		—								\$		
Portugal			ç														õ								ã	õ				ç		ã		'		ç			
Spain								£			¬						ñ								Ñ				..										
Spanish-Speaking											¬						ñ								Ñ				..										
United Kingdom											¬														E				—										

For World Trade countries, substitute the character shown opposite the country for that shown for the International character set; where no difference is shown, the printable characters are the same as those shown for the International character set.

Figure C-1 (Part 3 of 3). EBCDIC Printable Characters

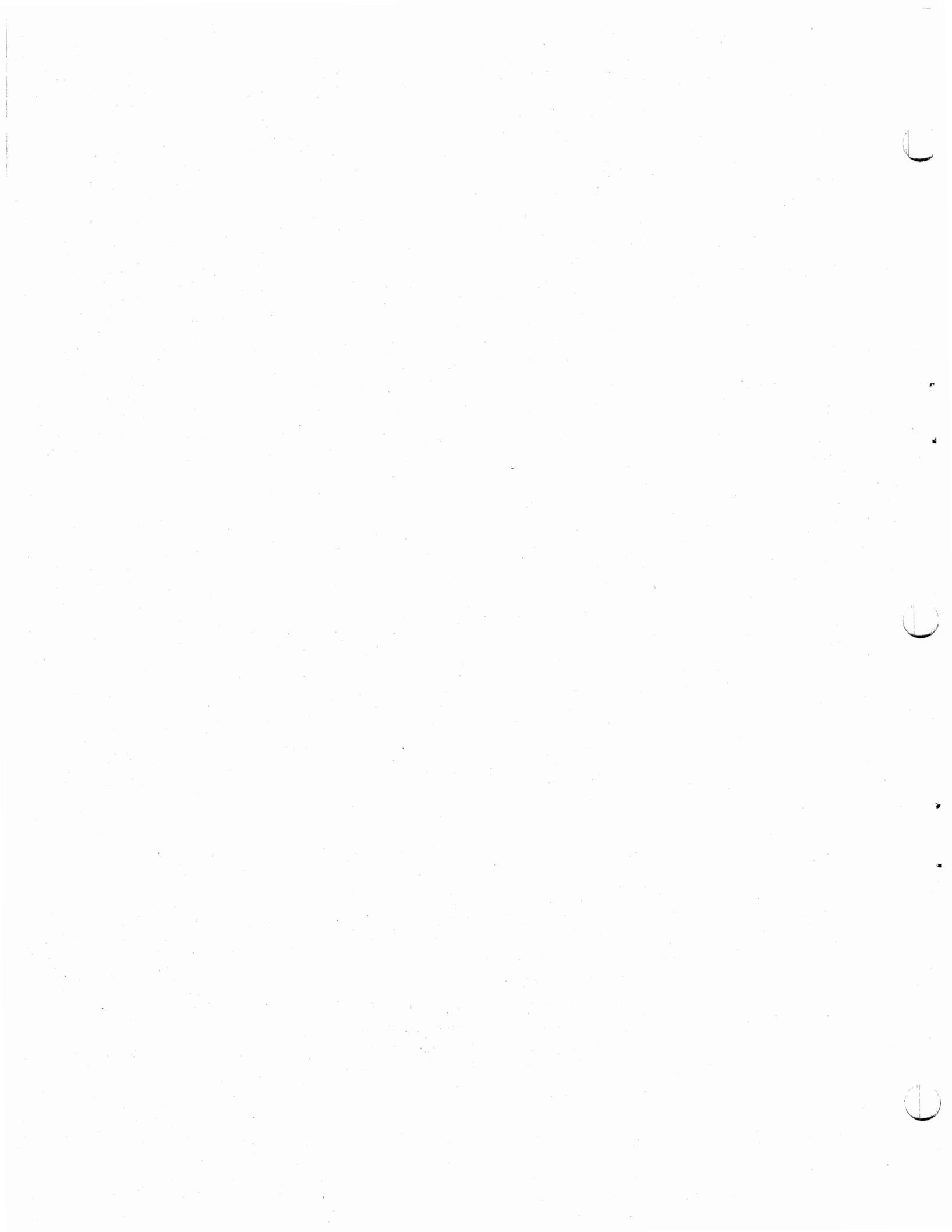
HEX	CHARACTER
40	SP
41	°
42	┌
43	└
44	/
45	·
46	ヲ
47	フ
48	イ
49	ッ
4A	E
4B	·
4C	<
4D	(
4E	+
4F	
50	&
51	エ
52	ア
53	ハ
54	ニ
55	ヨ
56	フ
58	—
5A	!
5B	¥
5C	*
5D	)
5E	;
5F	└
60	-
61	/
6B	,
6C	%
6D	—
6E	>
6F	?
7A	:
7B	#
7C	@
7D	'
7E	=
7F	"

HEX	CHARACTER
81	ア
82	イ
83	ウ
84	エ
85	オ
86	カ
87	キ
88	ク
89	ケ
8A	コ
8C	サ
8D	シ
8E	ス
8F	セ
90	ソ
91	タ
92	チ
93	ツ
94	テ
95	ト
96	ド
97	ニ
98	ヌ
99	ネ
9A	ノ
9D	ハ
9E	ヒ
9F	フ
A1	—
A2	ハ
A3	ホ
A4	マ
A5	ミ
A6	ム
A7	メ
A8	モ
A9	ヤ
AA	ユ
AC	ヨ
AD	ラ
AE	リ
AF	ル

HEX	CHARACTER
BA	レ
BB	ロ
BC	ワ
BD	ヅ
BE	ヴ
BF	°
C1	A
C2	B
C3	C
C4	D
C5	E
C6	F
C7	G
C8	H
C9	I
D1	J
D2	K
D3	L
D4	M
D5	N
D6	O
D7	P
D8	Q
D9	R
E0	\$
E2	S
E3	T
E4	U
E5	V
E6	W
E7	X
E8	Y
E9	Z
F0	0
F1	1
F2	2
F3	3
F4	4
F5	5
F6	6
F7	7
F8	8
F9	9

Figure C-2. Katakana Character Set





## Appendix D. Cassette Recorder Specifications

### Supply Voltage

Use either an ac adapter or new batteries.  
(Recorders having only a two wire AC connector are recommended.)

### Frequency Response

100 Hz to 4 kHz  $\pm$  3 dB (See note 1.)  
and 6 kHz must not be less  
than 6 dB below 1 kHz

### Signal-to-Noise Ratio

Better than 30 dB (See note 1.)

### WOW-and-Flutter

0.4% rms (maximum)

### Signal Distortion

Less than 8%, including tape dependence (See note 1.)

### Phase Distortion

Maximum delay of:  
1.2 ms at 200 Hz  
0.6 ms at 300 Hz  
0.3 ms at 400 Hz  
0.2 ms at 500 Hz  
0.1 ms at 1 kHz  
0.05 ms at 3 kHz  
0.15 ms at 6 kHz  
(all with reference to 1.8 kHz) (See note 2.)

### Input Impedance

Greater than 500 ohms (See note 3.)

### Output Impedance

Less than 20K ohms

### Output Level

Minimum of 1 V, peak-to-peak  
Maximum of 12 V, peak-to-peak (See note 4.)

### Input Sensitivity

Must record a 10 to 20 mV, peak-to-peak, signal on the microphone, or  
equivalent input (See note 3.)

### Speed

1-7/8 inches (47,625 mm) per second  $\pm$  4%

### Tape

Standard oxide (gamma ferric)  
0.150-inch-wide (3,81 mm) data-certified tape, 0.0005 inch (0,013 mm) thick  
IML data recorded on tape is equivalent to:  
2560 flux changes per inch (maximum)  
1280 bits-per-inch data density  
2400 bits-per-second data rate

Recording time per cassette tape:

15 minutes on each side - C-30

30 minutes on each side - C-60 (See note 5.)

*Notes:*

1. The frequency response should be measured with a 100-ohm signal source impedance driving the selected input, with 10 to 20 mV, peak-to-peak. If tone control is available, it should be set to the high range, to obtain the best frequency response.
2. Phase distortion is measured using a *Hewlett Packard HP3770A* or a *Wandel U Goltermann Model 45A/WGR/1* with a 20 mV peak-to-peak signal, using 1.8 kHz as a reference.
3. The cassette recorder microphone input (or equivalent) must accept a 10 to 20 mV (peak-to-peak) signal from a 100-ohm source. It must maintain the phase distortion, frequency response, signal-to-noise ratio, and signal distortion requirements of this specification. Units should have a meter, or an automatic level control, for adjusting the record level.
4. This refers to voltage measured at the point of input to the 3653.
5. C-60 tape is recommended, to minimize tape speed variations. Use "certified data" (or equivalent) cassette tape. Longer tapes will cause error for this application.

For proper operation of the IML Backup feature, all of the selected cassette recorders must meet or exceed all of the requirements specified in this section.

### Cassette Tape Suppliers

Because of the stringent requirements for data recording, data certified (or equivalent) tape cassettes are required. For the convenience of the 3650 Retail Store System users, a few suppliers are listed (in alphabetical order), as follows:

**BASF Systems**

Crosby Drive

Bedford, Massachusetts 01730

Telephone (617) 271-4000

**Information Terminals Corporation**

323 Soquel Way

Sunnyvale, California 94086

Telephone (800) 538-7938

**Maxwell Corporation of America**

Moonachie, New Jersey 07074

Telephone (201) 933-4200

**TDK Corporation**

755 East Gate Blvd.

Garden City, New York 11530

Telephone (516) 746-0880

**TDK Corporation**

931 South Douglas Street

El Segundo, California 90245

Telephone (213) 644-8625

## Appendix E. Problem Determination

The IBM 3650 Retail Store System maintenance philosophy is built around problem determination procedures. The retail store system users and operators may implement a procedure, when the system fails, that allows them to recover system functions, unless the store controller also fails. For more information about user problem determination procedures, see *IBM 3650 Retail Store System Problem Determination Procedures and Operator Messages*.

Problem determination procedures, provided to the user, allow the failing system unit to be moved offline, usually allowing the rest of the system to continue operation. If the problem is isolated to an IBM unit, the appropriate service representative is called to repair the unit, check it online, and return it to service. The rest of the system operates while the repair is made. If the problem is isolated to a communications line or store loop segment problem, the user takes appropriate action.

Detected malfunctions are logged at the store controller by error recording techniques, to assist the customer engineer (CE). This helps the CE to isolate intermittent type failures. Diagnostic programs and maintenance procedures allow isolation of failing functional parts in a machine. Once isolated, these failing parts are replaced, and the machine is tested and returned for use in the operating retail store system.

### Point of Sale Terminal

If a momentary interruption of service occurs because of the malfunction of a store controller or a store loop connecting the store controller with the IBM 3653 Point of Sale Terminals, these terminals can operate in offline mode until the store controller or store loop is repaired.

In the event of a point of sale terminal failure, the terminal should be moved to a customer-provided repair facility located within the store, and a spare terminal should be installed in its place. The customer engineer (CE) will repair the failing terminal in this repair facility and test it online, via a customer-provided store loop termination.

### Communication Terminal

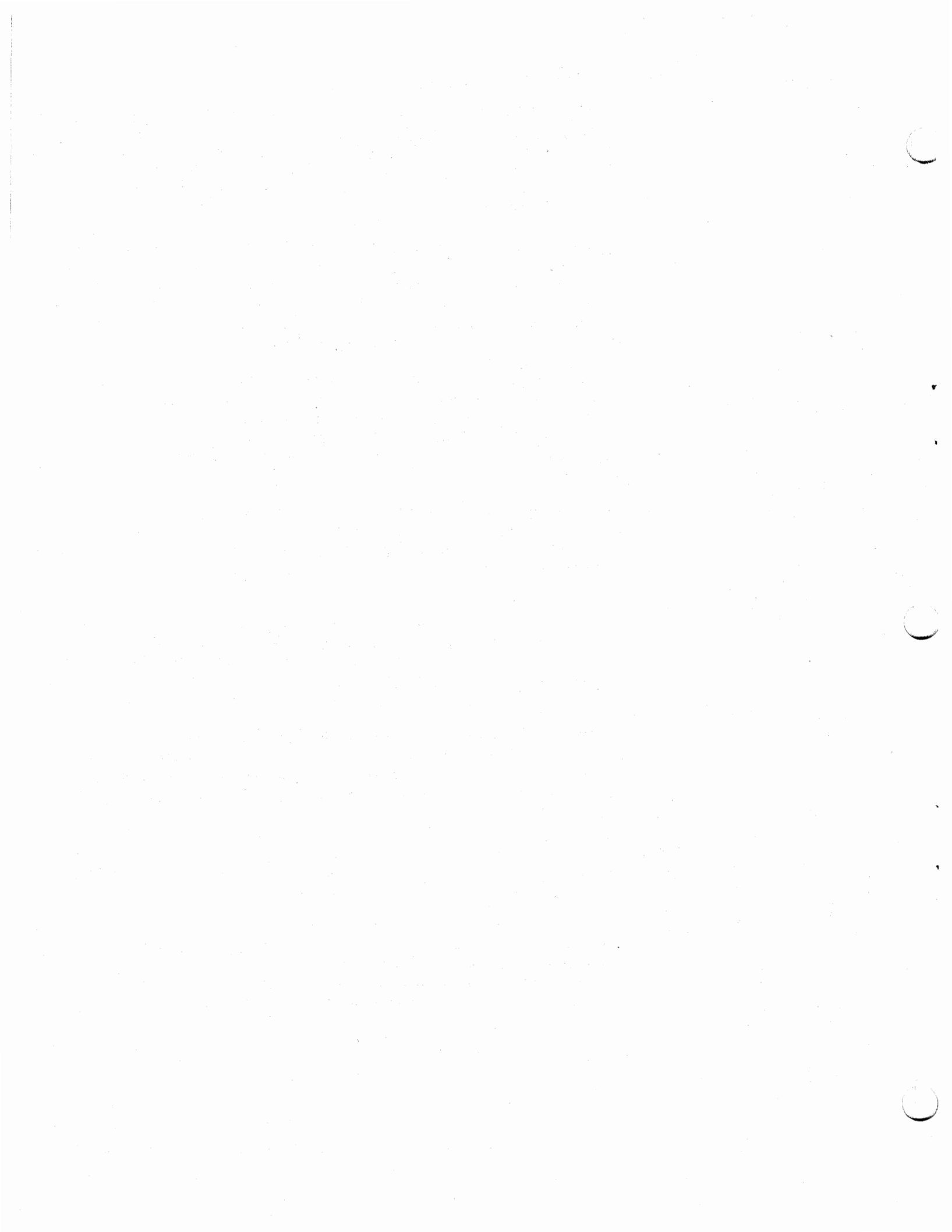
The IBM 3767 Model 2 Communication Terminal allows diagnosis and repair of malfunctions by service personnel. It is packaged so that failing units can be readily adjusted or replaced. Indicators, printouts, automatic test procedures, online and offline tests, and maintenance analysis procedures (MAPs) are provided to assist in isolation of the problem or failing unit.

### Display Station and Ticket Unit

Failure of an IBM 3275 Model 3 Display Station or IBM 3657 Ticket Unit requires using an alternate unit until the failing unit can be repaired.

### Store Controller

All controller data transmitted from the host processor to the store controller is stored on the subsystem library at the host. Checkpoint dumps of the contents of the store controller disk to the host processor, taken by the user, provide the information necessary for restoring the store controller data files as they were at the last checkpoint.



## Appendix F. IBM World Trade Considerations

The IBM 3650 Retail Store System has the same configuration and operates in the same manner for IBM World Trade users and United States users, except as stated in this chapter.

### Language Requirements

Retail Store System control and indicator nomenclature and printouts are available in the following languages:

- Danish
- English (UK)
- English (USA)
- French
- German
- Italian
- Japanese (Katakana)
- Spanish
- Swedish

Machine nomenclature and character sets are available upon request for Austria, Belgium, Denmark, Finland, Norway, Sweden and for Portugese-speaking, and Spanish-speaking countries.

### Special Features for World Trade

The retail store system available to World Trade is available with the following additional special features.

#### *Synchronous Clock*

The 3651 or 7480 Store Controller Synchronous Clock feature (World Trade countries only) provides a link to the host communications adapter for the attachment of the IBM 3796-3 Modem or for a PTT mandatory modem at 1200 or 600 bps. Operation at 600 bps or 1200 bps is selectable. The Synchronous Clock feature for World Trade is *not* the same as the Synchronous Clock feature for the USA.

#### *Direct Attachment*

This feature, which operates at 2400 bps, makes it possible to cable-connect the IBM 3651 or 7480 Store Controller to the IBM 3704 or 3705 Communications Controller without modems and a carrier communications line (if these are located within 100 feet (30m) of each other).

The Synchronous Clock feature for the USA is the same as the Direct Attachment feature used in World Trade.

#### *Direct Line Link*

This feature is available in some World Trade countries to permit the IBM 3659 Model 1 Remote Communications Unit to be compatible with, and to meet, PTT specifications. Consult your teleprocessing specialist to determine if this feature is required.

## **Katakana**

The 128-character Katakana feature (see Appendix C) is available on:

- IBM 3784 Model 1 Line Printer - with a special print belt. Other print belts are not interchangeable on the line printer that has been modified for this feature.
- IBM 3284 Model 3 Printer - with a special character generator.
- IBM 3275 Model 3 Display Station - with a special character generator and a Katakana keyboard.
- IBM 3657 Ticket Unit - with special graphics for printing tickets.

## **Comma for Decimal Point**

World Trade countries (except Canada, Japan, and the United Kingdom) use a comma to denote a decimal point. The retail store system is modified, by a user option, to accommodate this distinction.

## **Cash Drawer Till Tray**

A till tray, with movable partitions to accommodate the various sizes of currencies and cash-like tender, is optional.

## **Cash Drawer Accessory**

This option (for World Trade in Europe, the Middle East, and Africa only) is an accessory that may be used on the 3653 Point of Sales Terminal, to provide two additional coin pockets. It is an insert that fits into the bill compartment of the cash drawer till tray.

## **Storage Expansion Feature (Certain World Trade Countries) – Release 3.2**

*Note:* Consult your IBM marketing representative for information on this RPQ feature.

In Release 3.2, this RPQ feature allows you to increase the total storage capacity to 120K bytes. The Storage Expansion feature provides for an additional 16K bytes of storage in volume 1 (beyond the previous maximum of 48K bytes).

## **Power Codes**

There are specific power options for each machine.

Power codes for IBM World Trade machines are:

Machine Type	50Hz ac, 1-phase	60Hz ac, 1-phase
3651 or 7480	200V, 220V, or 235V	200V, 208V, or 230V
3653	100V, 110V, or 123.5V 200V, 220V, or 235V	115V, 100V, or 200V
7481	100V, 110V, or 123.5V 220V or 235V	100V, or 115V

## **Basic Functions**

The point of sale terminal and the store controller have the same basic functions for IBM World Trade as for the United States, but they are modified for special World Trade requirements. The store controller handles up to three decimal positions for currency calculations, depending upon the country. All field lengths are the same both for World Trade and the United States, including the input and total fields. Differences in keying sequences for the point of sale terminal are accommodated if they are within the option capability of the terminal.

There is one programming package to cover all IBM World Trade requirements. The unique language adaptations and the mechanical differences are implemented at the time of manufacture. Selection of the appropriate subroutines and selection of the language for messages are implemented at system generation.

## **Selectable Functions for World Trade**

In addition to the basic functions and the selectable functions described in Chapter 3, the following additional selectable functions are available on machines for World Trade users of the IBM 3650 Retail Store System.

### ***Value Added Tax***

This selectable function enables the user, at the request of a customer, to produce a cash receipt (or sales check) that specifies the amount(s) of tax included in the sales transaction.

As line items are entered by the salesperson, they are sent to the store controller for tax calculation. As the line items are received, the store controller calculates and accumulates, in tax tables, amounts for up to seven tax codes, as specified by the user. The tax tables contain a user-specified tax description, including a percentage, and the amount of the tax.

When the TOTAL key is pressed, the terminal requests a readout of the tax table(s) from the store controller. A tax line for each of the specified tax codes is printed on the transaction journal and on the cash receipt or sales check.

The value added tax (VAT) keytop is shipped on all world trade language groups on standard keyboard and modifiable keyboard independent of presence or absence of the Value Added Tax Selectable Function.

### ***Decimal Quantity***

This function allows the user to enter decimal quantities during sales mode. The salesperson can enter a decimal quantity in the format XX, XX when the QUANTITY-AMOUNT guidance indicator is on. Two decimal positions are assumed for all quantities that are entered, using this function. The decimal quantity key replaces the NON-TAX key when this function is selected, and this must be specified when the terminal is ordered. Refer to Figure 3-2.

A blank separates the whole amount from the decimal quantity amount on the 3653 terminal display (for Release 3.2). During subsystem definition, a rounding option may be specified, with a value. The value is applied to the amount calculated as a result of the decimal quantity times the price extension.



## Halfpenny Support

The point of sale terminal keyboard for the United Kingdom includes a ½ key, which, when pressed, adds a halfpenny to any amount entered. The point of sale terminal rounds up to the next halfpenny when item sales are fractions of a penny other than ½. When the halfpenny option is used, automatic tax calculation is not allowed.

The halfpenny fraction characters (½) can be encoded and printed by the IBM 3657 Ticket Unit for users in the United Kingdom. The operator of the IBM 3275 Model 3 Display Station uses the H key to enter a halfpenny in the rightmost position of the encode and print price fields.

With this function, the 3653 terminal operator, after entering the amount including halfpenny, must press the 1/2 key before pressing the Enter key. In the case of whole penny entries, the operator simply presses the Enter key.

For halfpenny entries using department keys (in Release 3.2), the operator presses the 1/2 key, followed by the appropriate department key. In the case of whole penny entries, the operator ends the key entry by pressing the appropriate department key.

## Rounding of Totals

This function allows the user to adjust the total of a cash sales, as well as a deposit or payment, according to rounding rules established by the retailer. The adjustment is made to the amount due that is displayed when an amount tendered is requested. The user is given the option of specifying the rounding ranges for the low-order position of the amount field and the points to be rounded to for each range. This data is placed in the 3653 when it is initialized. The following are examples of some ways in which the rounding can be accomplished:

Units Position Range	Round	To
1-2	down	0
3-4	up	5
6-7	down	5
8-9	up	0
	or	
1-4	down	0
6-9	down	5

## OEM EAN/UPC Wand Attachment (RPQ 858921)

The OEM EAN/UPC wand attachment (RPQ 858921) allows an OEM wand to be attached to a 3653 Point of Sale Terminal. This RPQ allows certain Universal Product Codes (UPC) and European Article Numbers (EAN) to be entered into a 3653 terminal by scanning the bar code with a hand-held wand.

This attachment supports EAN-13 Formulas 7 and 9, along with UPC-A Number System 0, 2, and 3 and UPC-E zero-suppress formats (UPC formats are EAN Formulas 1, 2, 3, and 4).

## Appendix G. Glossary

Asterisked (\*) definitions are reproduced with permission from the American National Dictionary for Information Processing, copyright 1975, by the American National Standards Institute. Copies of this dictionary may be purchased from the National Standards Institute at 1430 Broadway, New York, New York 10018.

**access method:** A technique for moving data between main storage and input/output devices.

**alphameric:** \*Pertaining to a character set that contains letters, digits, and usually other characters such as punctuation marks.

**application program:** A program, written by a user, that applies to a particular application.

**audible alarm:** An alarm that is activated when predetermined events occur that require operator attention or intervention for system operation.

**basic functions:** In the retail store system, all functions (features) provided by IBM to allow specific operations to be performed by the store controller, point of sale terminal, display station, or ticket unit. Examples are batch printing and ticketing.

**batch print:** The printing of batches of information that have been stored on the store controller integrated disk file.

**cash receipt:** An itemized list of merchandise purchased and paid for by the customer with cash or a cash-like document.

**cash-like tender:** A document (such as a check, gift certificate, etc.) that is used in the same manner as cash for payment of merchandise (may sometimes be referred to as a "noncash document").

**checkpoint records:** Records that contain the status of a job and the system at the time the records are written by the checkpoint routine. These records provide the information necessary for restarting a job without having to return to the beginning of the job.

**configuration:** The group of machines, devices, and programs that make up a data processing system.

**controller storage:** The generic name for auxiliary (disk) storage and active (monolithic) storage in a store controller. (2) The basic store controller's 40,960 bytes of storage, which is expandable, in various increments, to 106,496 bytes.

**controller storage save:** The automatic writing of the critical areas of controller active storage onto the integrated disk when power is turned off or when a power failure is detected.

**cursor:** A movable spot of light (or a short line) that indicates where the next character will be entered on the display station screen.

**data maintenance:** The function of adding to, changing, or deleting information in store controller files (data sets).

**disk:** See *integrated disk*.

**display:** (1) A visual presentation of data. (2) In the retail store system, either an electronic transaction display that presents visual information to the point of sales terminal operator and to the customer; or an electronic display screen that presents visual information to the display station operator.

**driver:** A hardware device used to connect two or more devices. In the retail store system, a hardware device used to connect the store loop to the controller and to connect the controller to the host processor.

**duplex:** \*In communication, pertaining to a simultaneous two-way independent transmission in both directions. Synonymous with full-duplex. Contrast with *half-duplex*.

**EBCDIC:** \*Extended Binary-Coded Decimal Interchange Code.

**edit:** \*To prepare data for a later operation. Editing may include the rearrangement or the addition of data, the deletion of unwanted data, format control, code conversion, and the application of standard processes such as zero suppression.

**encode:** \*(1) To convert data by the use of a code or a coded character set in such a manner that reconversion to the original form is possible. Encode is sometimes loosely used when complete re-conversion is not possible. (2) In the retail store system, to magnetically record information on a merchandise ticket, credit card, or employee badge. This information can be read by the point of sale terminal wand reader (special feature) or the ticket unit reader (two-inch merchandise ticket only).

**file:** \*A set of related records that are treated as a unit.

**file name:** (1) A name assigned to a set of input data or output data. (2) A term that identifies a file in the store controller. The name contains six alphameric characters, with the first character always alphabetic; no special characters are allowed.

**franking:** In the retail store system, printing an indication on a document that the document has been processed. This franking may be a store header line, a "total" line, or a transaction number that is printed when a check, a discount coupon, or a gift certificate, etc. is inserted in the document insert station of the point of sale terminal, during certain types of transactions.

**function:** \*(1) A special purpose of an entity, or its characteristic action. (2) In data communications, a machine action such as carriage return or line feed.

**gross minus:** The accumulation, during a sales period, of all negative amounts (refunds, allowances, discounts, etc.) entered or calculated in sales transactions at the point of sale terminal. Contrast with *gross plus*.

**gross plus:** The accumulation, during a sales period, of all positive amounts (merchandise prices, taxes, deposits, etc.) entered or calculated in sales transactions at the point of sale terminal. Contrast with *gross minus*.

**half-duplex:** \*In data communication, pertaining to an alternate, one-way-at-a-time, independent transmission. Contrast with *duplex*.

**hexadecimal:** Pertaining to a number system with a base of 17; valid digits range from 0 through F, where F represents the highest units position (15).

**host conversational:** Pertaining to an IBM basic function that allows an IBM 3653 Point of Sale Terminal or an IBM 3275 Model 3 Display Station to communicate with the host processor.

**host processor:** (1) An IBM System/370, with the relocate feature, that operates with OS/VS or DOS/VS. (2) The central processing unit that controls the entire retail store system.

**initial machine load (IML):** A portion of the operational environment that is loaded into the store controller's active storage, to control its operation. It then initializes the point of sale terminal.

**integrated disk:** An integral part of the store controller that is used for magnetically storing files, application programs, controller storage contents (during controller storage save), and diagnostics; synonymous with *disk*.

**inquiry:** (1) A request for information from storage; for example, from a terminal to the store controller or host processor files. (2) A request for information or for a response.

**JCL:** Job control language.

**leased facility:** A facility reserved for sole use of a single leasing user.

**line control:** The scheme of operating procedures and control signals by which a telecommunications system is controlled.

**line speed:** The maximum rate at which signals may be transmitted over a given channel, usually measured in baud or bits per second.

**local (offline):** Pertaining to equipment or devices that are not under control of the central processing unit.

**message:** An arbitrary amount of information whose beginning and end are defined or implied.

**modem:** (1) \*(MODulator-DEMulator) A device that modulates and demodulates signals transmitted over data communication facilities (2) A device that enables transfer of digital processing data over communications facilities.

**modulo check:** In the retail store system, a calculation performed on values entered into a system by an operator. This calculation is designed to detect most common keying errors.

**noncash:** Monies owed as a result of certain sales transactions, but not yet paid in cash or cash-like documents; for example, monies owed in charge, COD, or layaway transactions.

**offline:** \*(1) Pertaining to equipment or devices not under control of a central processing unit. (2) In the retail store system, pertaining to a machine or a device that is operating in stand-alone mode, not under the control of a store controller. (3) Pertaining to the store controller when it is not communicating with the host processor. Contrast with *online*.

**OEM:** Original equipment manufacturers.

**online:** \*(1) Pertaining to equipment or devices under the direct control of a central processing unit. (2) In the retail store system, pertaining to a machine or a device that is operating under the control of a store controller. (3) Pertaining to the store controller when it is communicating with the host processor. Contrast with *offline*.

**operational environment:** The collection of IBM-supplied controller data, application programs, in addition to lists, tables, control blocks, and files that reside in a store controller and that control its operation.

**private-line communications channel:** A communications channel furnished by a common carrier to a particular group of users for his exclusive use or, when not furnished by a common carrier, a privately owned, operated, and maintained communications channel.

**problem determination:** The process of determining the source of a problem as being a program component, a machine failure, an environmental failure, a common carrier link, a user-supplied element, or a user error.

**record key:** One or more characters within a file record (or data set record) that are used to identify the record or control its use.

**sales check:** A store's preprinted form, on which certain types of sales transactions, such as a charge, cash-send, return, or layaway, are recorded.

**SDLC:** Synchronous data link control. A discipline for the management of synchronous, transparent, serial-by-bit information transfer over a communications channel. SDLC includes comprehensive detection and recovery procedures for transmission errors introduced by the communications channel.

**store loop:** A cable over which data is transmitted between the store controller and the terminals of the IBM 3650 Retail Store System.

**store loop driver:** A hardware component used to connect the store controller to the store loop.

**subsystem:** A secondary or subordinate system usually capable of operating independently of, or asynchronously with, a host processor.

**subsystem library (SLIB):** A VSAM keyed-sequential data set at the host processor, used to contain all of the IBM-supplied controller data, certain control records, and application programs for store controllers connected to the host processor.

**switched communications network:** A system of communications facilities and stations that enables a station to establish a data link over a switched line with a remote station associated with, or attached to a network, so that communication can take place.

**synchronous line control:** The scheme of operating procedures and control signals by which a telecommunications system is controlled.

**terminal:** A machine or group of machines capable of generating and/or receiving signals transmitted and/or received from communications line.

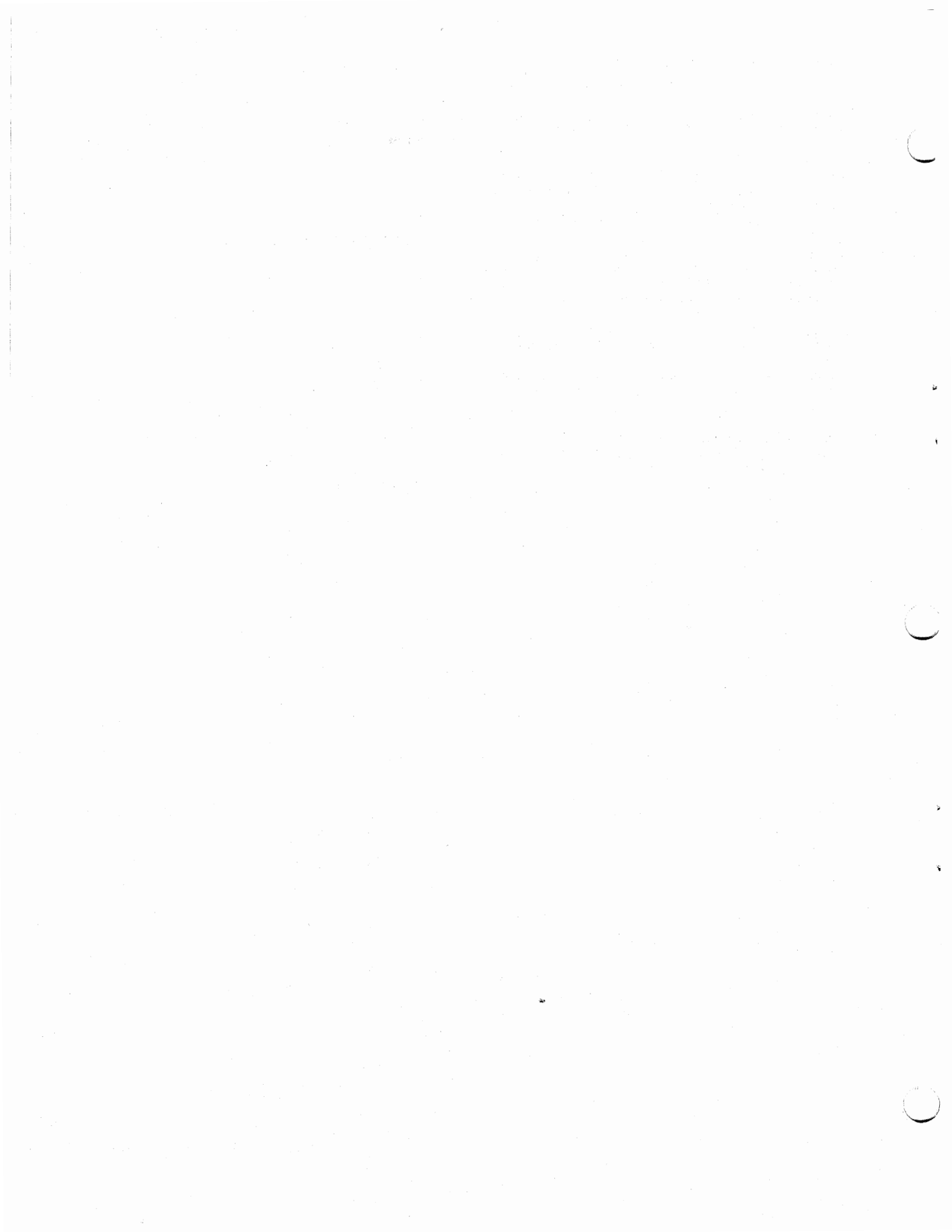
**transaction journal:** A printed record of all transactions that have taken place at the point of sale terminal. Within Subsystem Support Services, a record kept of all SSS functions performed that have gained access to, or that have affected the information in, the subsystem library.

**transaction log:** In the retail store system, a record of transactions performed at the point of sale terminal. This log is magnetically recorded and stored on the store controller integrated disk.

**user:** Anyone who requires the services of a computing system; specifically, anyone who uses IBM equipment and programs.

**wanding:** Passing the tip of a wand reader over the magnetically encoded stripe of a merchandise ticket, credit card, or employee badge.

**wand reader:** A special feature available for the IBM 3653 Point of Sale Terminal, used to read information on merchandise tickets, credit cards, and employee badges.



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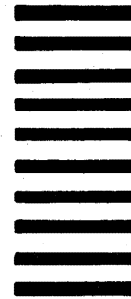
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