



Small Parcel and Bundle Sorter Guidelines

**Handbook PO-430
December 1991**

U.S. Postal Service
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Small Parcel and Bundle Sorter Guidelines
Handbook PO-430

December 1991

A. Explanation

This new Handbook PO-430, *Small Parcel and Bundle Sorter Guidelines*, provides uniform policy, procedures, and guidelines for implementing, using, and maintaining the Postal Service's automated small parcel and bundle sorting equipment.

B. Distribution

1. Initial.

This issuance is being distributed directly to all postal facilities that currently have small parcel and bundle sorter machines.

2. Additional Copies.

Order any necessary additional copies of this handbook from your materiel distribution center on Form 7380, *MDC Supply Requisition*.

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D. Issuances Rescinded

This issuance of Handbook PO-430 does not replace any previous issuance.

E. Effective Date

This material is effective upon receipt.



Allen R. Kane
Assistant Postmaster General
Delivery, Distribution, and Transportation Department

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Chapter 1 Introduction

110 Purpose

This handbook establishes methods and techniques needed to maximize the utilization of the small parcel and bundle sorter (SPBS) mechanization system. It provides operating guidelines for all levels of management in the regions and divisions and offers specific instructions for mail processing personnel who are trained to operate the SPBS system.

120 Scope

The Postal Service has developed a system which mechanizes the sorting of small parcels and bundles for efficient distribution and results in sig-

nificant productivity improvements. This system provides for the sorting of small parcels, bundles, and irregular parcel post (IPP) into 100 separate output locations. The maximum size and weight of mailpieces that can be processed by the SPBS is 12" x 15" x 8" and 20 pounds. The mechanical capacity of the SPBS is 11,000 pieces per hour. The SPBS can be assembled into three basic configurations by using 90 degree modules (straight, right or left L-shaped, or U-shaped). This versatility allows the SPBS to be designed to comply with nearly all USPS processing facilities and their mail handling requirements. See Exhibit 120 for samples of typical SPBS configurations.

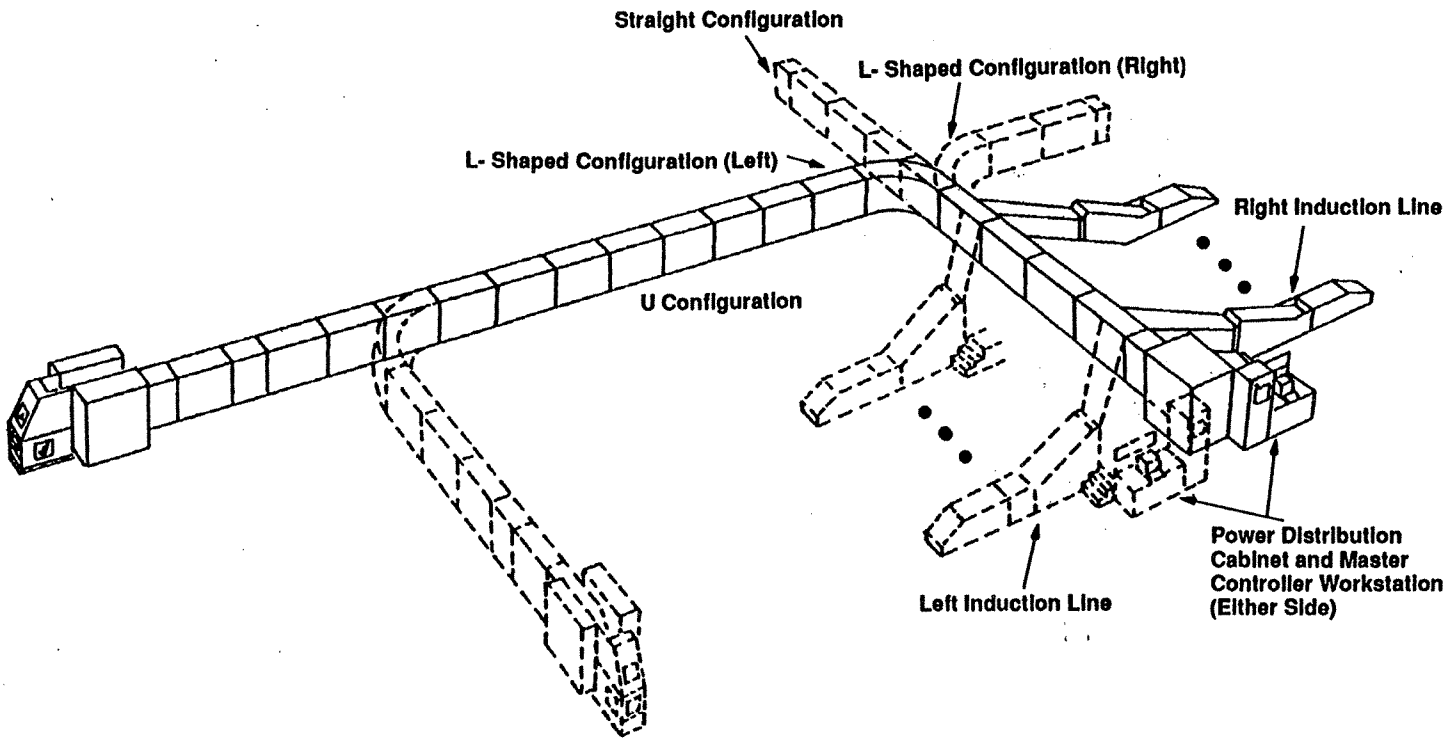


Exhibit 120, Typical SPBS Configurations

Chapter 2

SPBS System Overview

210 Purpose

This chapter provides an overview of the SPBS for mail processing personnel who perform operating functions in the mechanized distribution of small parcels, bundles, and IPP's.

220 Physical and Functional Description

221 General

The SPBS is a series of modular units that are physically integrated into a single unit excluding the computer workstation and power cabinet (see Exhibit 221). The SPBS achieves the primary mail processing objective of receiving small parcels, bundles, and IPP's, and sorting them into 100 separate output locations. This sorting equipment accepts mail and presents it to the operator/keyer who manually moves the mailpieces one at a time onto the code/weigh conveyor. The operator/keyer uses the operator's keyboard to enter ZIP Code related keycodes based on mail characteristics and/or address data. This machine is operator paced. The mail that is loaded onto the induction station is automatically weighed and a beam of light detects whether the mailpiece is too wide, too long, or overheight for processing. This is all part of the induction process. Inducted mail is transferred to a series of independent carrier cell units transported by a chain drive system. Each carrier cell unit employs a self-contained discharge belt which ejects mail to either side of the transport path. A specially designed output chute system at each sort location transfers discharged mail into output receptacles (trays, sacks, U-carts or wire containers). When the receptacles become full, by weight limitations or by visual inspection, a sweep operator (sweeper) is alerted by audible and visual alarms to replace them. If the destination output bin is full or being swept, the mailpiece is discharged to the reject bin. If for some reason mail is not sorted into its destination output bin or the reject bin, it is automatically dropped into the overflow chamber. Mail from the overflow chamber and reject bin will be reentered into the input sort system or processed manually.

222 Computer Workstation

The computer workstation consists of a personal computer (PC), monitor, and printer. The computer workstation allows the supervisor to configure the system software to meet specific needs. It is menu driven and provides on-line and off-line system monitoring. The computer workstation is automatically powered on when the main power switch on the power cabinet is actuated. It goes through a booting-up process (start-up) and implements a self check routine which, if satisfactorily completed, continues the system start-up sequence. During the normal operating mode, the workstation monitor provides several production displays. These displays detail graphically and statistically individual induction station throughput, as well as the total system throughput. The system manager is the software program that interfaces the user with the operating environment of the SPBS through the computer workstation. The system manager generates various system operational reports from data received from the master processor controller. The system configuration and sort program information that is loaded onto the hard disk of the workstation is downloaded to the master processor controller (MPC). The MPC then takes operational control of the SPBS accepting inputs from the operator at the induction station. The MPC is the "system brain."

Note: During mail processing, the MPC continues to input data into the computer workstation hard disk storage. This data is then available to produce reports as requested by the supervisor. Some reports can be generated in an on-line mode while others must be generated in the off-line mode. (See Chapter 6.)

The computer workstation is also used by maintenance personnel to perform programmed diagnostic routines to locate and isolate malfunctions. The workstation maintains records of all machine failures or operator keying errors.

223 Power Cabinet

223.1 General. The power cabinet is the distribution center for controlling and supplying AC power throughout the SPBS system. Commer-

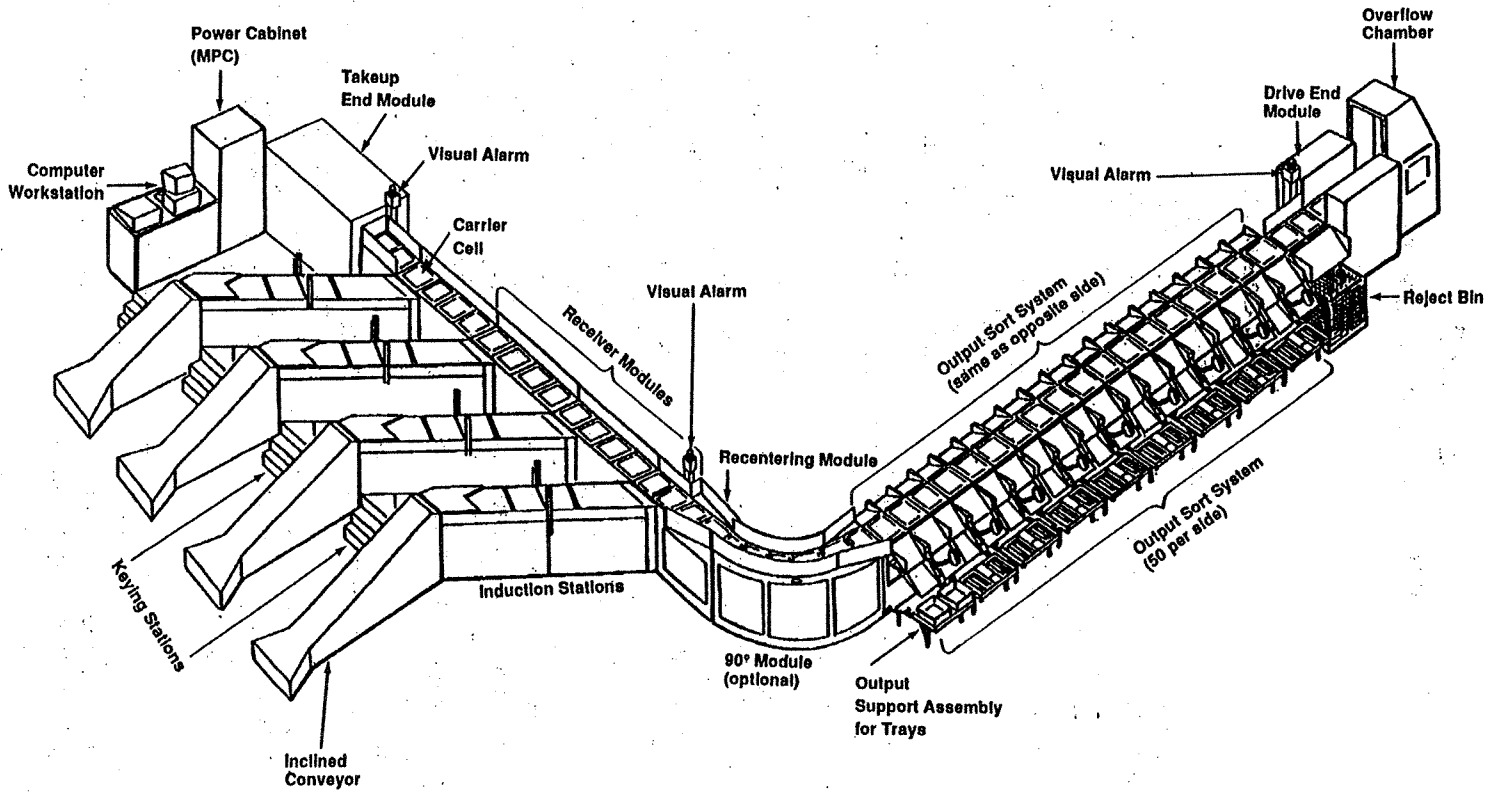


Exhibit 221, SPBS System

cially supplied 3-phase, 208-volt AC power is used as the prime power input. The input source power enters through the top of the cabinet and the output system distribution power leaves at the lower rear portion of the cabinet. The distribution of this power is controlled by manually actuated switches, circuit breakers, and electrically actuated relays. System start-up and power distribution occurs in the following sequence:

a. The CB1 (main power switch) handle, located on the front of the power cabinet, is raised to turn the circuit breaker to the on position. This supplies power to all system CPUs as well as to the entire computer workstation.

b. The supervisor turns the workstation on, and then downloads the sort program from the workstation to the master processor-controller.

c. The system start enable keyswitch on the power cabinet is turned to the on position to distribute AC power to all the system modules.

d. The chain run keyswitch on the rear of the power cabinet is turned to the on position. There is a 10-second delay, and then power is supplied to the main drive motor, starting the drive chain in motion and transporting the carrier cells through the system. During the 10-second delay, audio and visual alarms are activated to alert all personnel that the system's drive chain is about to run.

e. The machine operator/keyer turns the induction line start enable keyswitch to the on position. This provides power to the induction line motors and starts movement of the induction line conveyor belts.

223.2 Front Panel. A description of the power cabinet's front panel switches and indicators is outlined below (see also Exhibit 223.2):

Control Indicator	Function
Main Switch Off/On Circuit Breaker (CB1)	Main circuit breaker for power cabinet.
L1, L2, and L3 Indicator Lights (red)	3-phase source power indication.
System Power On Indicator (green)	Lights when CB1 is turned on. Indicates power on sequence is complete.
Chain Run Meter	Indicates chain operating time.
Circuit Open Indicator (yellow)	Lights to indicate an open circuit breaker.

Control Indicator	Function
Start Enable Keyswitch	Enables the sequencing of AC power distribution through the system.
Induction Power Indicator (green)	Lights when power is applied to the induction system.
Sort Power Indicator (green)	Lights when power is applied to sort distribution system.
Chain Run	Lights when chain is running. Indicator(green)
Chain Stop Indicator (red)	Lights when chain has been stopped.
Emergency Stop Push/Pull Switch (red)	Removes AC power from the entire system, except power for the CPUs and workstation.
Emergency Pressed Indicator (red)	Lights when any system's emergency stop or interlock switches is pressed.
Emergency Reset Push Button/Switch	Must be pressed after an emergency stop condition to enable power distribution.
Alarm Reset (momentary) Keyswitch	Resets master processor controller interruptions after an emergency reset pushbutton switch has been pressed to clear an emergency situation.
Auto Mode Indicator(green)	Lights when keyswitch is in auto position and indicates SPBS is running in operational mode.
Jog Mode Indicator (blue)	Lights when keyswitch is in jog mode position and indicates SPBS is running in maintenance jog mode.
Maintenance Mode Indicator(yellow)	Lights when keyswitch is in maintenance position.
Call for Maintenance Indicators 1 through 6 (yellow)	Indicates which induction station operator has pressed the call maintenance button.

Control Indicator	Function
Drive Motor Overtemp Indicator (red)	Reports an over-temperature condition in the chain drive motor.
Drive Motor Overtemp Reset Pushbutton	Must be pressed after overtemp problem is resolved and prior to restarting the drive chain.

223.3 Rear Panel. A description of the power cabinet's rear panel switches and indicators is outlined below (see also Exhibit 223.3):

Control Indicator	Function
Chain Run Keyswitch (momentary)	Starts chain drive motor.
Chain Run Indicator (green)	Lights when chain is running.
Chain Stop Pushbutton Switch	Stops chain drive motor.
Chain Stop Indicator (red)	Lights after chain is stopped.

224 Master Processor Controller

The master processor controller (MPC) is a printed circuit board mounted in a noise insulated panel at the top of the takeup end module. The master processor controller is the primary controller (system brain) after the system software program has been downloaded and during operation. It maintains a record of each mailpiece weight and its destination bin. If the weight is within tolerance, the weight information is transmitted to the master processor controller, which maintains a record of the weight and the sort bin in which the mail will be off-loaded. The MPC automatically sends an alert to the sweep area when trays are near or at their weight limits. The weight information is passed to the induction station 45 degree module and the receiver carrier cell belt via induction CPU. The mail's weight determines the ejection speed of the mailpiece from the 45 degree conveyor belt and the speed of the receiver carrier cell belt. This combined control will approximately center the mailpiece on the carrier cell belt.

225 Induction Station

225.1 General. The SPBS system can contain 4, 5, or 6 induction stations depending on USPS facility requirements. Each induction station (see Exhibit 225.1) is comprised of the following primary components:

- a. Input conveyor
- b. Inclined conveyor
- c. Operator keying station
- d. Code/Weigh module
- e. Buffer/45 degree module

225.2 Input Conveyor. The BOL (beam of light) detectors at the bottom of the inclined conveyor control the motor that drives the input conveyor. When the BOL is not blocked, the input conveyor belt rotates until the mail on the bottom of the inclined conveyor blocks the BOL. The input conveyor must be fully loaded with mail prior to starting the SPBS system.

225.3 Inclined Conveyor. The movement of the inclined conveyor belt is controlled by the BOLs at the top and lower end of the inclined conveyor. The lower BOL controls the mailflow from the input conveyor; the top BOL controls and presents the mailflow to the operator. The belt continues to move until the mail is dropped onto the keying station area. When the operator moves the mail onto the code conveyor, the BOLs are unblocked and cause the inclined conveyor motor to move the belt.

225.4 Operator Keying Station

225.41 General. The operator keying station is a platform area where machine operators/keyers perform their keying duties. When the mailpiece arrives at the keying station, it must be faced to allow reading of the address information. The operator display must indicate that loading and keying can begin. After the key code is entered, the operator positions the mail on the code conveyor so that its longer dimension is approximately parallel to the V-shaped positioning edge nearest the operator.

225.42 Operator Controller. The operator controller located on the code/weigh module near the weigh station provides the following capabilities:

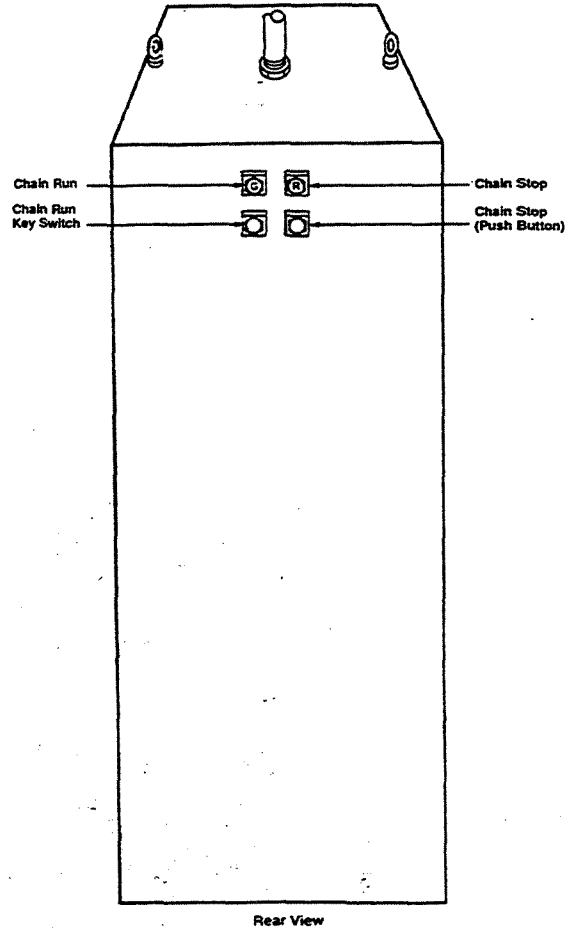
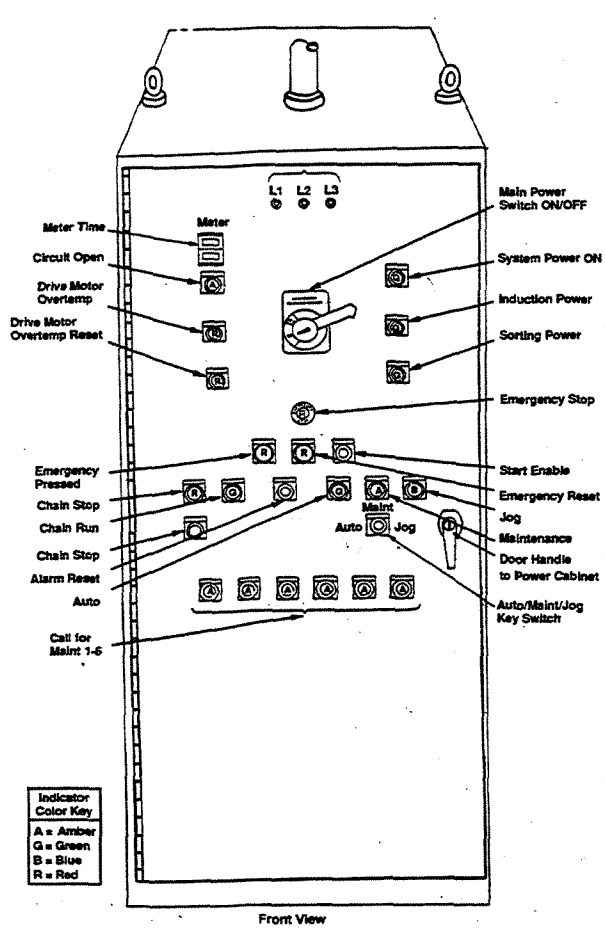


Exhibit 223.2, Power Cabinet Front Panel

Exhibit 223.3, Power Cabinet Rear Panel

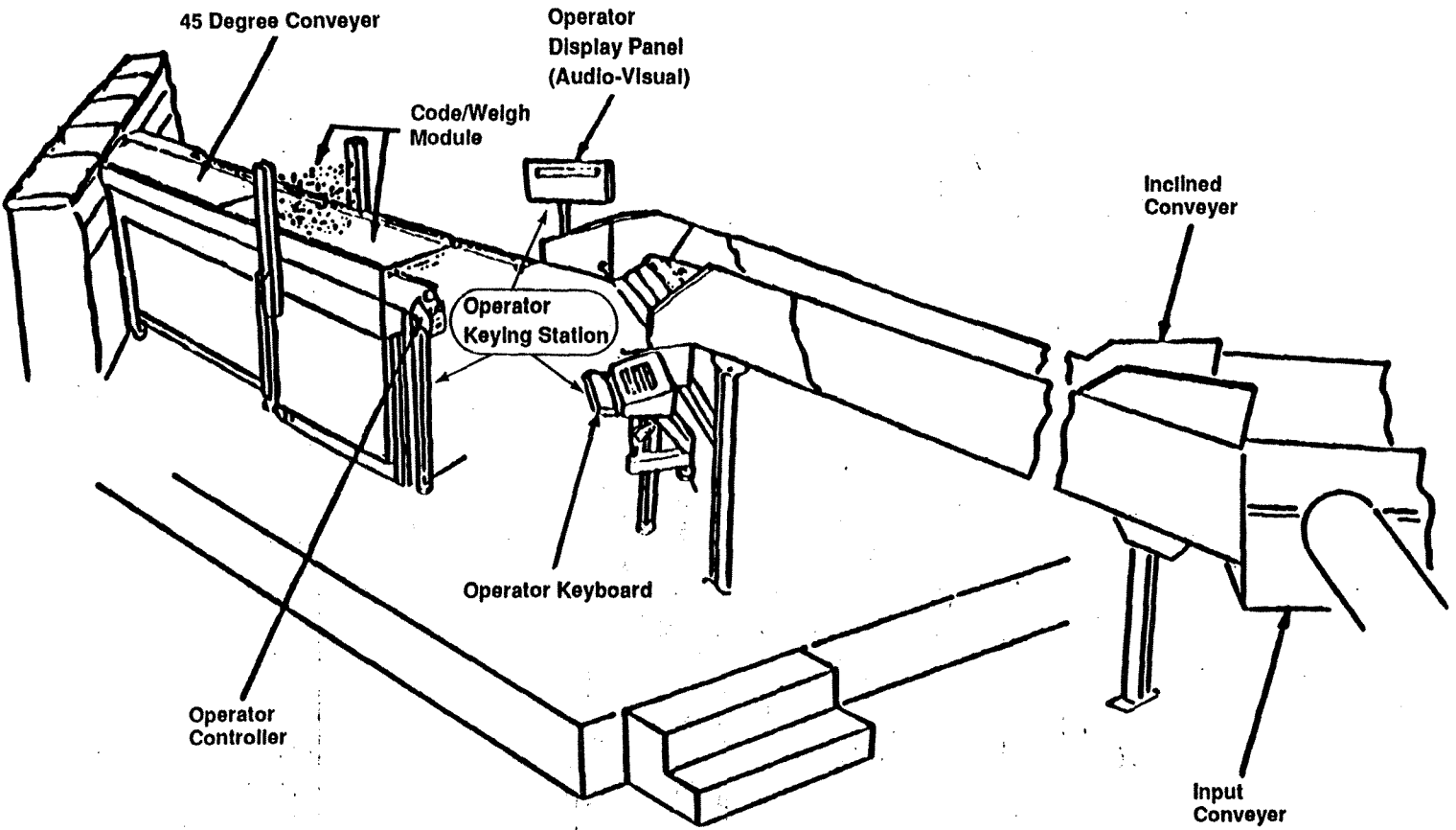


Exhibit 225.1, Induction Station

a. *Induction line start enable keyswitch.* Allows start-up of induction line 25 seconds after main transport chain drive is started. The automatic sequence of conveyor belt start-up is:

- (1) 45
- (2) buffer
- (3) weigh
- (4) code

b. *Induction line reset pushbutton switch.* Starts up induction line after being stopped due to oversize or overweight condition.

c. *Call maintenance pushbutton switch.* Causes light on power cabinet panel to light and alerts maintenance personnel of a problem on a specific induction line.

d. *Emergency stop pushbutton switch.* Removes power from SPBS system except for the computer workstation and master control processor units. It can only be restarted via the emergency reset pushbutton switch located on the power cabinet's front panel.

225.43 Operator Keyboard. The operator keyboard (see Exhibit 225.43) is attached to the code/weigh module at the left side of the induction station near the top of inclined conveyor. The keyboard's position is easily adjustable via hand sized grooved plastic knobs. The operator keyboard is used to enter the data representing the sort plan. The keyboard contains the following keys:

Key	Function
Function keys F1,F2,F3,F4	Each key can be programed to represent an entire sort bin destination or some portion of a sort code. Therefore, in some instances, it is necessary to press only one key for a code.
Numeric keys 0 through 9	Represents numeric value as shown on key.
Enter key	Functions as a carriage return to permit keying of less than the specified digits in a multi-digit sort plan.

Note: When the enter key is used, the system fills to the right of the code with zeros. For example, if you are on a four digit sort plan with an allowable key hit of F1-345, the mailpiece will

automatically be inducted upon receipt of the fourth digit. Given this scenario a key hit of F1-3 enter or F1-34 enter would be acceptable. The code generated by the machine as a result of the enter key would be F1-300 and F1-340. In this case, the assignation of F1-300 and F1-340 must be accomplished in your sort plan.

Repeat key	Repeats last entered keycode.
Cancel key	Pressed when wrong keycode is entered. When the operator enters the keycode and it is determined by a comparison check in the induction CPU to be invalid, the operator display gives a visual display and an audio alarm informing the operator to try again. If the second attempt fails, the mailpiece is automatically sent to the reject bin.

225.44 Operator Display Panel. The operator display is a fluorescent type display mounted on the code/weigh module of the induction station opposite the operator keyboard. The position of the display can be adjusted vertically and rotated right or left. The operator display provides the following types of information for the operator:

Display Instruction	Audio Alert	Deviation
Reposition/rekey	Audio-multiple beep	Improperly loaded or oversize item (first occurrence)
Remove mailpiece (throwoff) and reset	Audio-multiple beep	Improperly loaded or oversize item (second occurrence)
Overheight remove and reset	Audio-multiple beep	Overheight mailpiece
Overweight remove and reset	Audio-multiple beep	Overweight mailpiece
Clear line and reset		Local induction station stops

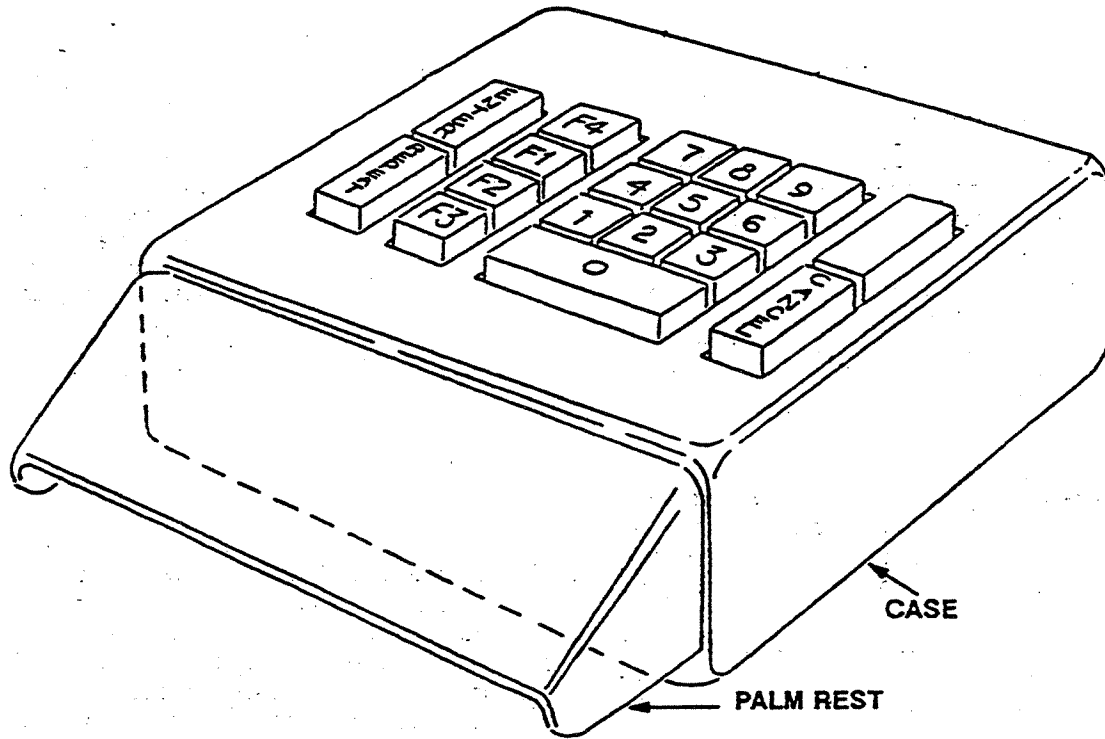


Exhibit 225.43, Operator Keyboard

Clear line and reset

No display instruction turn-off key, clear line reset

Emergency stop (system stops operating)

Power failures (system stops operating)

225.5 Code/Weigh Module

225.51 General. The code/weigh module is a single structural unit aligned at one end with the inclined input system and connected at the other end to a buffer/45 degree module to form an induction line. This unit is comprised of the following:

a. Code conveyor. The code section is where operators key code information for bundle sorting based on mail type. It consists of a motor driven conveyor belt and four beams of light (BOL), three on one side of the belt and one on the other.

b. Weigh unit conveyor. The weigh unit section contains a computer-controlled weighing mechanism, a DC motor driven conveyor belt, and two BOLs, one at each end of the belt. The weigh unit conveyor receives mail from the code conveyor if all parameters have been satisfied. If the mailpiece is too heavy, the weigh conveyor stops and the mail must be removed by the operator who must then reset the induction line via the operator controller reset pushbutton switch.

225.52 Beam of Lights. The BOLs (near the V-shaped positioning edge of the code conveyor) are used to detect if the mail is too long for the system. The two BOL's (one above the other) near the end of the code conveyor belt are used to detect mailpieces with abnormal shapes that may cause problems in the machine. The code conveyor belt will stop if the BOLs detect out of specification parameters or the keycode has not been entered, otherwise the code conveyor loads the mail onto the weigh module.

225.6 Buffer/45-Degree Module. The buffer/45-degree module is a single structural unit comprised of the buffer conveyor and 45-degree conveyor. Nearly all the control electronics for the entire induction station are housed in this module. The buffer section of this module consists of a DC motor driven conveyor belt and vertically mounted BOLs. The 45-degree section contains a conveyor belt supported by several

rollers that allow the belt to be rotated to a 45-degree angle toward the direction of the carrier cell travel. The 45-degree unit is so named because of its 45-degree interface with the receiver module supporting the carrier cells. The 45-degree module allow mailpieces to be loaded from the induction lines to receiver carrier cells at a controllable speed.

226 Sort Distribution System

226.1 General. The sort distribution system (see Exhibit 226.1) transports the mailpieces from the output of the induction station to the output bins. This system is comprised of the following:

- a. Carrier cells
- b. Receiver modules
- c. Recentering module
- d. Sort output modules
- e. Drive end module
- f. Takeup end module

226.2 Carrier Cells

a. The carrier cells are individually controlled units used to carry the mail from an induction station output to its designated output bin.

b. The carrier cells are attached to the sort distribution main drive chain which moves the cells through the sort distribution system at a fixed speed. This transport chain forms a continuous loop from a sprocket in the drive end module, through all the sort distribution system modules, to a sprocket contained in the takeup end module.

c. There are two main functional components making up each carrier cell, a conveyor belt and its drive motor. The control electronics for these cells are mounted on the structural framework of the transport modules and apply control signals to the cell drive motor via a rail and brush system. The motor is reversible and therefore can turn the conveyor belt in either direction. This reversible motor allows a mailpiece to be centered on the cell conveyor belt in either direction, if inadvertently loaded to an off center position. Also, the mail can be ejected to the right or left output sort bins.

d. Each carrier cell has a bracket mounted on its left side that identifies its position relative to the cell identified as cell "0" (contains special bracket). These brackets are counted (sensed

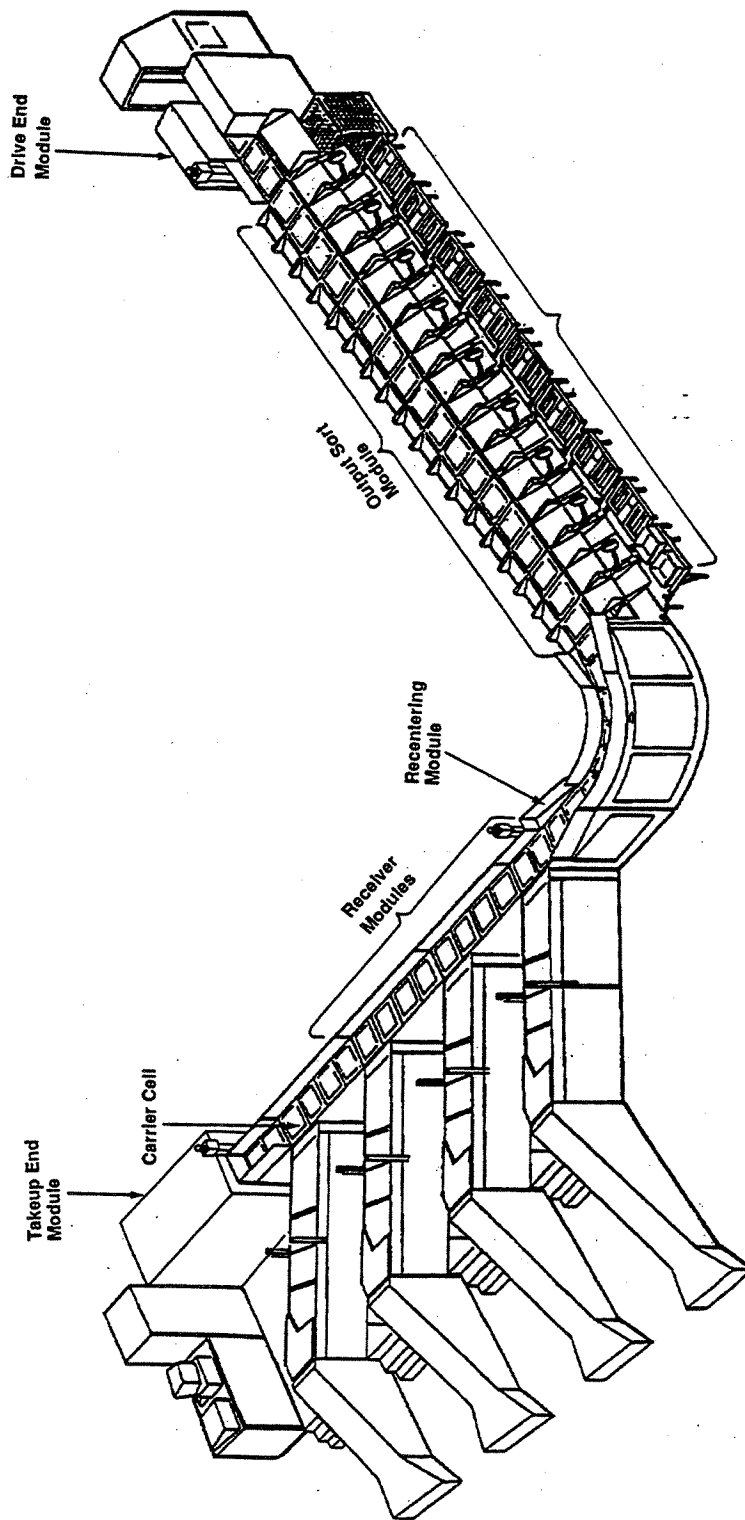


Exhibit 226.1, Sort Distribution System

magnetically) by "proximity sensors" on each receiver and output module. Therefore, the MPC knows the position of each cell as it travels through the system.

226.3 Receiver Modules. The receiver module is part of the sort transport system located at the end of the 45-degree module of each induction station. The receiver module and its carrier cells are controlled by the induction station it serves. Therefore, the number of receiver modules required for each system is determined by the number of induction stations. The master processor controller, through its own proximity sensors, keeps a count of the carrier cells. When an induction station operator inputs a keycode for a mailpiece, that information is transferred to the induction station CPU. The induction station CPU then requests a carrier cell assignment for the mailpiece from the MPC. The induction station CPU uses the input from its receiver module's proximity sensors to synchronize the 45-degree belt with the approaching assigned carrier cell. When the assigned cell reaches the induction line, the induction station CPU sends the motor drive signals to activate the carrier cell's drive motor to rotate the conveyor belt and accept the mailpiece.

226.4 Recentering Module

226.41 General. A recentering module is located on the last receiver module. It checks for mailpiece overhangs by means of a photo-detection system. If an unacceptable overhang exists, the recentering system activates the belt to properly center the mailpiece on the cell. The mailpiece is then transported by the sort distribution system to a destination bin in the output system.

226.42 Clear Plastic Barrier. The top side of the receiver modules opposite the induction stations has a superstructure supporting a clear plastic barrier. The last receiver module in a system has this barrier on both sides as well as three BOLs on each side to allow for recentering of mailpieces on a carrier cell.

226.5 Sort Output Modules. The sort output modules are used to support and control the carrier cells as they travel through the output system. When a mailpiece goes through the induction station, it is assigned a destination bin according to the sort program. It then transfers the following information about the mailpiece to

the output module controlling the assigned destination bin:

a. Number of its carrier cell. (This is tracked by proximity sensors on each module.)

b. Destination bin number.

c. Weight. The sort output module uses proximity sensors to detect cell "zero" and count the carrier cells as they pass. When the mailpiece cell is in the section of the track that corresponds to the destination bin, it sends motor drive signals to the driver board responsible for that sort point. The motor drive board transfers the correct amount of voltage with desired polarity to successfully eject the mailpiece to the programmed bin on the right or left. The cell is then carried by the sort transport system down through the sort line. When the cell reaches the reject bin (at the drive end module) the last "C" module's section controller sends a signal to execute the carrier cell test by causing the cell motor to turn the belt clockwise. This also causes any mail that may not have been ejected previously to be automatically ejected into the reject bin. When a bin is being swept, the output module reroutes a mailpiece destined for that bin to the reject bin. All information pertaining to the output status of a mailpiece is sent to the computer workstation where it is recorded in memory to be used for generation of management reports.

226.6 Drive End Module

226.61 General. The drive end module is located at the end of the SPBS. The drive end module contains the main drive motor which moves the transport chain (attached to carrier cells) throughout the entire sort distribution system. See Exhibit 226.1.

226.62 Reject Bin. The reject bin framework structure is physically part of the drive end module. The output section of the reject bin uses a single chute that outputs mail (rejects) to a wiretainer or 1046 hamper and does not use the tray support structure. For design efficiency the reject bin is physically part of the drive end module. The reject bin is adjacent to the "odd numbered" sortation bins, and is not part of the 100 assignable sortation points.

226.63 BOL Detectors. Two beam of light (BOL) detectors are located at the top part of the drive end module to monitor any mailpieces or malfunctioning carrier cells traveling through the re-

ject bin area. If this occurs, the MPC is notified that a carrier cell or associated circuitry has malfunctioned but does not stop the machine. Three retro-reflective BOLs located at the bottom of the module detect mailpieces that may inadvertently fall into this area; in such a case, the system automatically stops.

226.64 Overflow Chamber (Waterfall). If a mailpiece has not been rejected in the sort output system or reject bin, the mail is automatically thrown into the overflow chamber as the carrier cell starts its downward rotation on the drive end module sprocket. Three retro-reflective BOLs located at the bottom of the drive end module detect mail that may inadvertently fall into this area. If these BOLs become blocked, the SPBS system automatically stops.

226.7 Takeup End Module. The take-up end module houses the master processor controller (MPC). It also provides the return mechanism for the transport chain to the drive end module. The transport chain (carrier cells in upside down position) travels from the drive end module through the lower part of the transport modules to the take-up end module. The transport chain travels around the large bearing supported sprocket inside the take-up end module to the top of the first receiver module (carrier cells right side up).

227 Sort System Output

227.1 General. The sort system output (see Exhibit 227.1) function begins when the mail is ejected from the carrier cell conveyor belt. As the mail leaves the carrier cell conveyor belt in the sort distribution system, it is deposited by way of chute assemblies, into either USPS trays, sacks, U-carts, wiretainers, or the missent/reject bin. Sweep operators are alerted by audible/visual alarms, or use their judgment to determine when the bins should be swept or changed. The sort system output consists of the following:

- a. an output chute
- b. a control arm
- c. framework support for trays

227.2 Output Chute. The chute system is made up of two individual output chutes. The top chute is basically stationary while the bottom chute is easily moveable from the maintenance position (fully raised) to the tray operating position (lowered halfway) to the storage position (fully

lowered). It can be locked into the maintenance and operating positions. Output chutes deposit the mail into mail receptacles (tray, sack, U-cart, or wiretainer). Output chutes also direct the mail into the reject mail bin. Unlike the output chute to other mail receptacles, the reject bin uses a single chute that outputs to a USPS 1046 hamper and does not use the metal tray support assembly.

227.3 Control Arm. Each output assembly is equipped with its own control arm assembly mounted between the two chutes which pivots away when changing sortation receptacles. The control arm contains the following:

a. *Emergency stop push-pull switch.* Illuminates when pressed and halts the operation of all mechanical parts. Must be pulled to reset before restart can begin. Emergency stop pushbutton switch is located on every other control arm assembly along the sort output system.

b. *Two sweep switches with indicator light (right and left).* These switches are used by the sweeper to perform the bin bypass function. The sweep switch must be pressed and the sweep switch indicator light must be flashing before sweeping, to indicate that the output chute is being swept. If the switch is not pressed again after sweeping, the mail will continue to be diverted to the reject bin and the light indicator in the sweep switch will also flash.

c. *Bin full indicator light (amber).* Bin full indicator is located on top of the output control arm assembly. It lights (steady) when bin is near weight limitation and is accompanied by a momentary audio alarm. When the containers are full or when the sweep switch is pressed once or the sweep button has not been pressed again after container was exchanged, the amber indicator light flashes.

227.4 Framework Support. The tray support assembly framework supports two plastic mail trays when opened. The back of the tray support assembly framework is supported by adjusting pedestal legs; the front two legs are mounted on wheels. The tray support assembly can be moved to the storage position by removing both trays, lowering the chute to its storage position, and rolling the assembly frame back against the output assembly. In this position, sacks, U-carts or wiretainers must be used. Using the tray support assembly handle, the assembly framework can be pulled up and repositioned to accommodate plastic trays.

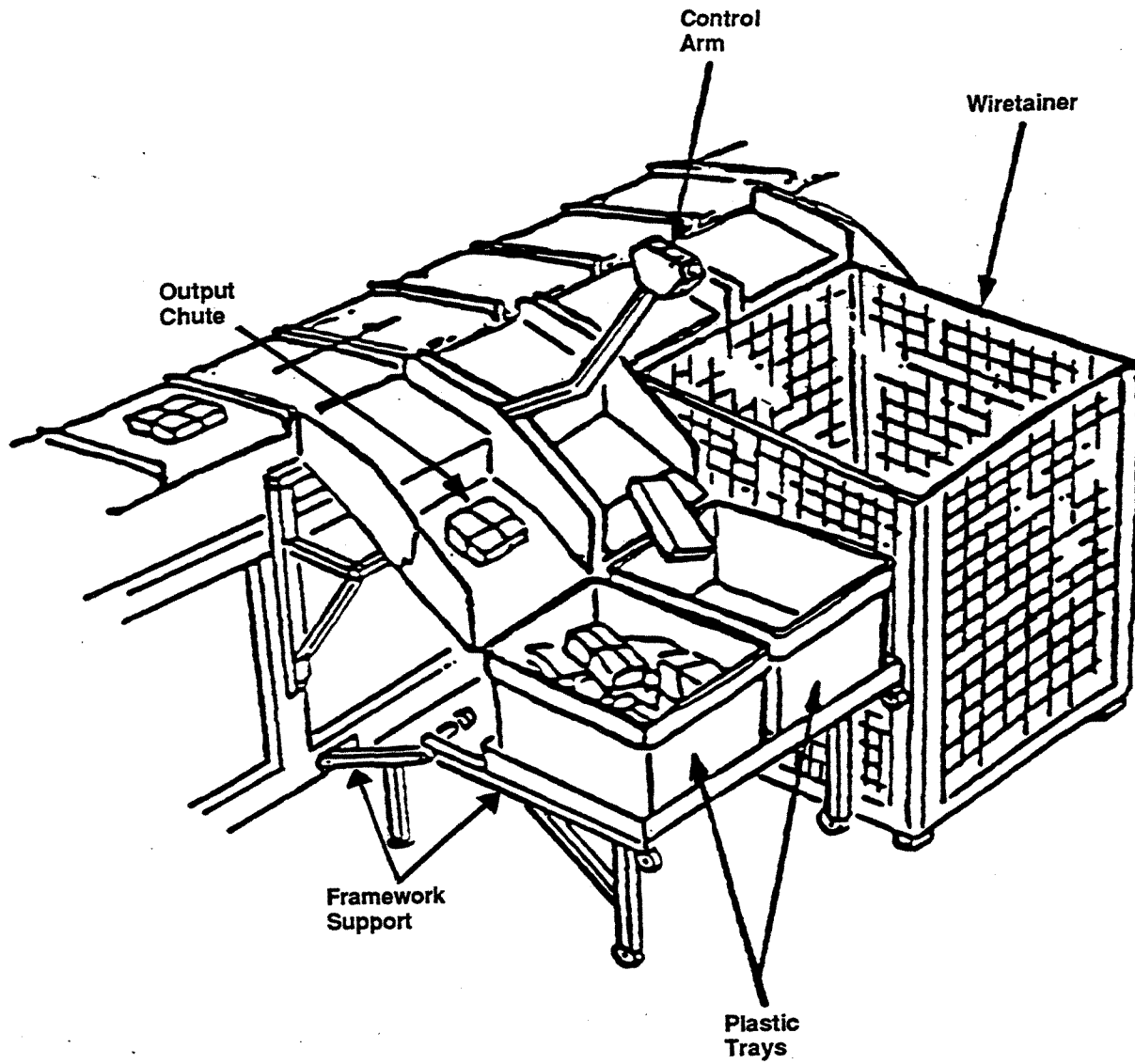


Exhibit 227.1, Sort System Output

228 Section Controller

The section controller monitors the weight of each bin by keeping track of the weight of each mailpiece. This weight information is sent with the mailpiece bin destination assignment by the MPC after the mailpiece has been successfully sorted and verified as it passes the reject area. When a section controller determines that a bin is approaching its weight limitation, it sends an alarm signal, as well as flashes a lamp. While the bin is being swept, the section controller interrupts the ejection of any mail to the bin, and alerts the master processor controller of the condition. This causes any mail scheduled for the bin to be sent to the reject bin. The MPC logs the rejected pieces and does not send any mail to that bin, until the sweep switch has been engaged. The bin sweep switch (right or left) on the control

arm assembly must be pressed after the sweep is complete. This action alerts the section controller that the bin is again ready to accept mail. The MPC zeroes the weight count for the bin, and reinstates the bin as a valid sort point.

229 Emergency Warning Devices

The audio/visual devices (three total) are mounted at the top of steel supports located at the take-up end module, at the last receiver module, and at the drive end module. These devices will be activated for 10 seconds after the chain run switch is activated. Emergency switch lights are integrated within the emergency switches themselves, to indicate which switch was pressed to stop the SPBS system. There is also an emergency switch indicator on the power cabinet itself.

Chapter 3 Use Criteria

310 Volume Requirements

311 General

The small parcel and bundle sorter has a maximum throughput of 11,000 pieces per machine hour. Daily small parcel, bundle, and IPP volumes, and space availability are controlling factors in determining if and how many machines should be located in a post office.

312 Minimum Run Time

Volumes sufficient for start-up and operation at a throughput necessary to achieve acceptable productivity shall be determined locally. A minimum runtime of two hours is suggested.

320 Sort Programs

321 General

Use the small parcel and bundle sorting machine (SPBS) with approved sort programs. Plans and proposed changes in the plan must be approved by the regional manager, Operations Networks. Sort programs for BBM, First-Class Mail, second-class controlled circulation, Priority, and other (identified locally), may be applied to the SPBS in the order of priority consistent with service standards. The associated MOD operation numbers will be in the 130 series. Use established distribution sort programs to distribute mail to proper separations. Separate mailpieces to ADC/SDC, SCF, incoming primary, incoming secondary, firm, box, or ZIP Code according to approved sort plan programs.

322 Memory Items

Memory item codes that are assigned to a ZIP Code, route number, firm name, city, or other unique addresses shall incorporate to the extent practical specific code combinations that can be associated with the address.

323 Distribution Accuracy

SPBS operators are required to key at an accuracy rate of 95 percent.

330 Authority to Expand Utilization

331 Authorization

Postmasters/managers are authorized to establish additional SPBS tours as needed (e.g., weekends or unusual high volume periods).

332 Distribution Sort Plans

332.1 Distribution sort plans and changes in intra-SCF distribution are approved by the MSC and/or BMC manager.

332.2 Intra-regional distribution sort plans and changes are approved by the regional manager, Operations Networks.

332.3 Dispatch make-up must conform to the national labeling instructions. Any deviations must be approved by the Office of Distribution Operations and Networks, Delivery, Distribution and Transportation Department, Headquarters.

333 Diagram Changes

333.1 Postmasters/managers are authorized to make SPBS diagram changes which may involve the relocation or exchange of bin locations, but do not involve the addition or deletion of separation items.

333.2 Postmasters/managers are authorized to make changes to the incoming diagrams including additions, deletions, or combination of local zones and firm directs as needed.

340 Bin Assignments

341 Making Bin Assignments

Densities and local service commitments should be the criteria for separation assignments. Bin assignments, beginning at bin number one, should be made after considering each of the following:

- a. Sort program by ZIP Code densities.
- b. Sort program by ZIP Code sequence.
- c. Sort program based upon the most efficient sweep arrangement.
- d. Sort programs in which any common separations are in the same location.

342 Preparing Label Diagram

Prepare a labeling diagram of the separation and code numbers assigned to each bin. This must be completed prior to machine installation. Bin assignments for the same sort programs on more than one machine in an office should be labeled the same to prevent sweeping errors.

343 Bin Labels

Bin labels should be distinctive by program so that sweepers do not mistakenly read a label assigned to another program. Labels must be updated to reflect any program changes.

350 Management Operating Data System

Following is a list of operations numbers and their definitions used on the SPBS:

Operation	Definition
134	SPBS, Outgoing, Preferential
135	SPBS, Outgoing, Bulk Business Mail
136	SPBS, Incoming, Preferential
137	SPBS, Incoming, Bulk Business Mail
138	SPBS, Outgoing Priority Mail

Note: Operation 134C is a composite of Operations 134 and 135. Operation 136C is a composite of Operations 136 and 137.

These operations will be listed as a separate subtotal within LDC 14 and will not be included with the opening and pouching operations. Operation 138 will be listed as a separate total within LDC-12 and will be included with the mechanization operation. The recording of SPBS workload is covered in section 410 of Handbook M-32, *Management Operating Data System for MOD 1 Offices*.

Chapter 4

Conditions for Machine Operation

410 Staffing Guidelines

411 General

Normally when the operation is fully staffed, all craft personnel assigned to the SPBS keying and sweeping operations should be qualified machine operators/keyers. If there is a need to increase the staffing of the sweeping operation beyond the assigned sweepers, the additional staffing will be from the mailhandler craft. Mailhandler craft employees will be assigned to the "input conveyor" which requires dumping and culling of mail for the induction station and other related duties.

412 Staffing

The number of trained employees required to staff a SPBS depends upon the number of induction stations in use. Depending on the mail volumes, both available and anticipated, the mail characteristics, and the sort plan, the SPBS machine should have the following recommended maximum crew size (depending on the induction stations in use during normal operating conditions):

a. 4-Induction Stations-12 positions

1. Keyers	-4
2. Sweepers	-2
3. Dumpers	-4
4. Cullers	-2

b. 5-Induction Stations-15 positions

1. Keyers	-5
2. Sweepers	-2
3. Dumpers	-5
4. Cullers	-3

c. 6-Induction Stations-18 positions

1. Keyers	-6
2. Sweepers	-3
3. Dumpers	-6
4. Cullers	-3

Note: Trained employees, above the crew requirements are authorized to provide relief for all types of absences.

420 Rotation

Keyboard operators rotate on a scheduled basis to other assignments. As a matter of day-to-day operating procedure, operators will not be required to key more than two consecutive hours or sweep for more than one hour per rotation. Rotation assignments include keying, sweeping, and other related duties.

430 Environmental Conditions

The environmental factors surrounding the SPBS machine area must be controlled to minimize distractive factors. The area in and around the machines is restricted to those managers or personnel required in the area. Take care to keep the area from becoming congested with equipment.

Chapter 5

SPBS Operating Procedures

510 Responsibilities

511 Supervisors

Supervisors responsible for the efficient operation of mechanized equipment must use approved mail processing criteria and operating procedures to obtain maximum productivity and utilization of the equipment. The duties and responsibilities of the supervisor include, but are not limited to, the following:

- a. Exercise a normal regard for safety of self and others by ensuring that all established safety policies and procedures are followed by all employees.
- b. Check with the general supervisor or tour superintendent for availability and types of mail to be processed.
- c. Check with maintenance personnel as to status and availability of the equipment.
- d. Provide maintenance personnel with the information needed to activate the equipment (i.e., sort program to run and start-up time).
- e. Ensure that a starting assignment rotation of employees has been prepared.
- f. Make certain all necessary forms are completed during equipment operation and all required reports are available from the system computer.
- g. Ensure that proper containers are in place at the appropriate bins. For example, when the sort plan dictates the need for a wiretainer, make sure a wiretainer is used.
- h. Maintain a continuous, smooth mailflow into and out of the operation to make sure that:
 - (1) Mail coming into the area is machineable, correct for the sort program being used and processed in proper time sequence.
 - (2) Processed mail going out of the area is properly containerized and labeled.
- i. Observe machine operators and support personnel in the performance of their duties. Provide instruction and on-the-job training when needed.

j. Inform maintenance personnel of problem areas on the equipment.

k. Inform immediate supervisor of any unusual situations or difficulties which might occur and make suggestions for solving these problems.

l. Analyze computer reports and video screen (CRT) information as required.

512 SPBS Operators

512.1 Keyers. The machine operator (keyer) performs a variety of tasks required to process mail using the SPBS. The machine operator reports to the supervisor responsible for the operation and has the following duties and responsibilities (but is not limited to):

- a. Qualifying on approved SPBS machine program.
- b. Starting and stop the equipment.
- c. Adjusting the keyboard position for efficient operation.
- d. Culling out non-processable items.
- e. Keying for a designated period and rotates.
- f. Clearing jams and resets induction line.
- g. Notifying supervisor or maintenance personnel when malfunctions or unsafe conditions occur.
- h. Remaining at console, keying until relieved.
- i. Performing other duties as assigned by supervisor.

512.2 Sweepers

512.21 General. The sweeper is responsible for removing mail from bins as scheduled, also emptying full bins immediately. Sweeping involves the physical act of replacing a container that has reached its preset weight limit (full) with an empty container. Sweeping operations vary from site to site and they must be appropriately detailed by the supervisor.

Note: SPBS plastic trays are slightly larger than those used on the flat sorter. They are used at the bin output to receive the mail. Where available, a wiretainer (a large wiremesh hamper on wheels) can also be used to receive the mail, but requires two bins to accommodate its larger size. Trays, sacks, U-carts and wiretainers can all be used and mixed within a sort plan.

Conditions requiring sweeping include:

- a. Full trays -by weight (visual aids provided)
- b. Full trays -by volume (no aids provided)
- c. Full sacks -by weight (visual aids)
- d. Full sacks -by volume (no aids provided)
- e. Full U-carts -by weight (visual aids)
- f. Full U-carts -by volume (no aids provided)
- g. Full wiretainers -by volume (no aids provided)
- h. Full wiretainers -by weight (visual aids).
- i. Full reject container (no aids provided)
- j. Overflow chamber/waterfall (no aids provided)

512.22 Sweeping Aids and Descriptions.

Outlined below is a list of indicators and a description of their functions designed to aid the sweeping operation:

a. *Amber light (steady illumination).* Tray nearly full or has reached 75% of weight limit and must be replaced. Mail will continue to be sorted until weight limit is reached.

b. *Amber light (flashing illumination accompanied by a momentary audio alarm).* Tray full and requires immediate replacement. Mail is being diverted to reject bin.

c. *Sweep switch with indicator (left & right).* When the sweep switch is pressed once, bin indicator light flashes. This indicates that the bin is being swept while the mail is diverted to the reject bin or that the sweep button has not been pressed again after the container was exchanged. The indicator in the sweep switch will also flash. When the switch is pressed again, the bin indicator flashing light and the indicator in the sweep switch will go out. Mail will again be sorted to that bin.

512.23 Sweeping Procedures

512.231 General. Sweep mail from bins, as necessary using SPBS trays, sacks, U-carts, or wiretainers. As part of the sweep process, the sweeper will engage the sweep switch and ensure

that the sweep switch indicator is flashing before sweeping. Mail which is destined for an output bin being replaced by a sweeper is, under this condition, automatically bypassed to the reject bin as a valid reject. Therefore, an empty replacement container must be immediately available at the bin when a full container is to be replaced. This minimizes the amount of mail bypassed to the reject bin. Reactivating the sweep switch resets the weight counter to zero to begin a new count for the output. Follow the procedures below to sweep:

- a. Gain quick access to outputs requiring service, as indicated by audio and visual alarms.
- b. Visually scan output to ensure no mail buildup occurs.
- c. Visually observe machine indicators and alarms to ascertain the nature of attention required.
- d. Visually scan output receptacles. Remove and replace when full.

512.232 Tray or Sack Replacement

- a. Replace as dictated by audio/visual aids.
- b. Replace according to dispatch schedule.
- c. Remove when full and replace with empty tray or sack. Amber indicator light remains flashing until proper sweep button (right or left) on the control arm assembly is pressed.

Note: Use proper lifting techniques at all times to prevent injuries.

512.233 Wiretainer Replacement

- a. Use with or without audio/visual aids.
- b. Without visual aids, the decision to exchange wiretainer is based on appropriate dispatch schedules plus one or more visual observations. When full, the sweeper must exchange it.
- c. With audio/visual aids operation is the same as the U-cart.

512.234 U-cart Replacement

- a. Replace as dictated by audio/visual alarms.
- b. Replace as a result of dispatch schedule.
- c. On output control arm, press appropriate sweep switch. Sweep indicator will light. (Mail is diverted to reject.)

d. Remove full container, replace with empty container. Amber indicator remains illuminated until proper sweep button (right or left) on the output control arm is pressed.

512.235 Reject Output

- a. No audio/visual aids are used.
- b. Visual check is required.
- c. Sweeper/supervisor judgment decides need for container replacement.

512.236 Overflow Chamber (Waterfall)

- a. There are no audio/visual aids. The sweeper must perform a visual check.
- b. To remove mailpieces, open chamber door, remove mail, and return door to closed (latched) position.

Caution: DO NOT remove or open chamber door while system is running. Always engage emergency stop switch before opening door.

- c. Mail in the overflow chamber should be collected, deposited in the reject container, and reprocessed through the induction station on a scheduled basis.

Note: Excessive buildup of mail or packages near the transport could cause the entire SPBS system to stop or damage the machine.

512.3 Dumpers and Cullers

512.31 General. Dumpers will dump mail received at the SPBS operation onto conveyors. This mail will generally be in sacks, pouches, hampers, or APC or BMC containers. Cullers will ensure that mail received by the keyers is within SPBS processing guidelines. Generally stated this means mail within the following range:

- (1) Minimum Size -3.5" x 5.0" x 1/4"
- (2) Maximum Size -12" x 15" x 8"
- (3) Minimum Weight -.25 pounds
- (4) Maximum Weight -20.0 pounds

512.32 Dumping Procedures. The dumper will provide a steady and even flow of mail to the culling belt and/or keyer. Dumpers will also ensure that the conveyors feeding the induction stations are not overloaded with mail that could possibly fall off the induction station. Mail will be continuously dumped so as not to let conveyors run dry. Dumpers will elbow sacks to make sure that they are empty. They will also strip the

labels from dumped sacks and finalize all empty equipment. The dumping area must have sufficient space for staging mail without blocking the aisles.

512.33 Culling Procedures. Cullers will take out all mailpieces that are deemed unacceptable for SPBS processing. These mailpieces will be deposited in a throw-off container for manual distribution. Cullers will ensure that the culling belt operation is appropriate (not too much, not too little). They will make sure that all bundled mailpieces are kept faced on the conveyor, to the degree feasible, so that the mailpieces are faced-up when received by the keyers. Cullers will maintain the integrity of bundled mail even when it is culled out into nonmachineable bundles. All loose or unsecured bundles must be rebanded when the integrity of the bundle can be readily maintained. This applies to both machineable and nonmachineable bundles.

520 Operating Instructions

521 Introduction

The SPBS has three modes of operation: Automatic, Jog, and Maintenance. "Automatic" is the only mode to be used by supervisory and operator personnel. Jog and maintenance operations are used by maintenance personnel only.

522 Operating Procedures

Supervisory personnel are responsible for the safe operation of the equipment. If any malfunctions occur or the equipment does not perform in accordance with start-up and operational instructions, maintenance personnel must be notified to correct the situation.

523 Prestart-up Procedures

523.1 General. Prior to starting the SPBS operation, there are various steps that must be taken by the supervisor, maintenance personnel, and SPBS operators.

523.2 Supervisor. The supervisor must ensure that:

- a. All data and output bins have been cleared from the previous run.
- b. Sufficient mail volume is available and properly prepared for processing on the SPBS.

c. All support equipment, such as trays and wiretainers, for sweepers are available, in place, and ready for safe use.

d. Support personnel and adequate space are available to safely stage mail coming into the operation without blocking aisles.

e. Support equipment and personnel are available to remove processed mail to dispatch or other processing areas.

f. Inclined conveyors and mail transport belts have been checked for any mail remaining from previous run.

g. Mail has been loaded onto the inclined conveyor belt (or other feeder unit as appropriate).

h. The area surrounding the SPBS has been checked for safety hazards and cleanliness.

523.3 Maintenance Personnel. The maintenance personnel are responsible for:

a. Routine preventive maintenance.

b. Ensuring that the SPBS is ready for safe operation.

c. Setting the main power switch to the on (up) position.

Note: See maintenance SBPS handbook.

523.4 SPBS Operator/Keyer. Adjust the following items for efficient operation as determined by the operator:

a. Keyboard position.

b. Display position, if necessary.

524 Start-up Procedures

To begin start-up procedures, supervisors must:

a. Ensure that all personnel are clear of the equipment and that the auto/maint/jog switch is in the "auto" position.

b. Rotate main switch CB1 (if power has not already been applied by maintenance) counter clockwise to apply power to the supervisor workstation and all CPUs in the system. The L1, L2, L3, and chain stop indicators on the front panel should light.

c. Load correct sort plan.

d. Turn the on/off switch on the PW/2 to the on position to download the sort program from the workstation to the master processor controller. The supervisor menu appears, along with a

series of message windows that appear momentarily on the screen, one at a time, indicating the download of software. The messages include:

- (1) Downloading Master Controller
- (2) Sending Configuration to Master
- (3) Configuration Sent to Master Controller
- (4) Downloading Sort Plan (Name.Type)
- (5) Sort Plan (Name.Type) Download Complete
- (6) Downloading Induction Stations
- (7) Downloading Section Controllers

d. Turn the system start enable keyswitch on the power cabinet clockwise to the on position to distribute AC power to all the system modules. The sort power, induction power, and system power on indicators will light.

e. Turn the chain run keyswitch on the rear of the power cabinet to the on position to supply power to the main drive motor. This puts the drive chain in motion and transports the carrier cells through the system. The chain stop indicators on the front and rear of the power cabinet extinguish and the chain run indicator lights.

Note: As a safety precaution, a brief delay takes place between turn on and drive motor actuation. During this time, lights flash and alarms sound at each end of the machine and the last receiver module.

f. Ensure that each keyer turns the induction line start enable keyswitch on each of their operator control boxes to the on position to start the induction line conveyor belts. The operator display panel will display the following three messages sequentially, one at a time:

- (1) Chain Started
- (2) Starting Belts
- (3) Load/Key

525 Run Procedures

These procedures must be performed by a trained operator. Single mailpieces are moved manually by the operator/keyer onto the code conveyor for the key coding process after which the mail is automatically handled by the machine. The machine sorts the mail into designated bins which are emptied by the sweeper. The trained operators must:

a. Observe the display on the operator display panel at the coding station for indications that loading and keying can begin.

Note: Keying can either precede or follow the loading of mail. One hand sliding the mail onto the load belt is preferred while keying with the other.

b. Load mailpieces on the code/weigh module so that their longer dimension is roughly parallel to the V shaped positioning edge nearest the operator. This is particularly true for larger pieces.

c. The loaded mail advances to end of load belt, but may stop to:

(1) Await key entry (operator enter key codes -if already entered, display instruction is blank).

(2) Await assignment to a particular carrier cell and momentarily stop (no operator action is required).

(3) Indicate a loading irregularity exists as follows:

Operator Detected

Irregularity	Instruction
Loosely bundled mail	Secure mail if possible.
Tubular mail	Place in throw-off container.
Oversize or overweight mail	Place in throw-off container.

Machine Detected

Irregularity	Audio Alert	Display/Instruction
Improperly loaded or oversize item (first occurrence)	Audio multiple beep	Reposition/Rekey.
Improperly loaded or oversize item (second occurrence)	Audio multiple beep	Remove mailpiece. Place in throw-off container and reset.
Overheight mailpiece	Audio multiple beep	Overheight. Remove and reset.
Overweight mailpiece	Audio multiple beep	Overweight. Remove and reset.
Local induction station stops		Clear line and reset.
Emergency stop		Clear line and reset (system stops operating).

Irregularity Alarm Display/Instruction

Power failure
No instruction. Clear line and reset (system stops operating).

d. A single audio beep is sounded as the mail leaves the loading belt for entry into the system. This signals the operator to begin the next loading processing cycle.

526 Turnoff Procedures

The following procedures are to be performed by the supervisor and operator:

a. The supervisor presses the chain stop button on the rear of the power cabinet. The drive chain stops moving.

b. The keyer turns the start enable keyswitches (located on the induction station) to the off position to shut down all induction stations.

Note: Make sure all reports have been recovered before turning off power to the entire system or data will not be recovered. Perform the following procedures only when there will be no runs for an extended period of time.

c. Turn the on/off switch on the system workstation to off.

d. Turn off the CB1 switch on the power panel.

All power is now removed from the system.

530 Alarm Warning System

531 Definition

531.1 General. An alarm warning system alerts personnel in the area that the SPBS drive chain will begin running within 10 seconds. The SPBS utilizes two types of alarm systems, audio and visual. They are described in the following sections.

531.2 Audio Alarm. An audio alarm device is located at the last receiver module and at both ends of the machine. The audio alarm sounds for 10 seconds after the chain run keyswitch on the rear of the power cabinet is activated.

531.3 Visual Alarm. One light post is located at the takeup end module, one at the last receiver module, and one at the drive end module. These lights illuminate for 10 seconds after the chain

run switch on the rear of the power cabinet is activated. Additionally, emergency stop lights are located in the emergency stop switches themselves to indicate which switch was pressed to stop the system. There is also an emergency pressed indicator on the power cabinet to indicate an emergency stop switch was pressed somewhere in the system.

532 Emergency Stop Condition

The emergency stop indicator on the power cabinet lights when the emergency stop switch is pressed to indicate an emergency condition. When an emergency condition occurs, all power is removed from the SPBS except for the CPU power supplies and power to the keyboard and printer. The sort program and related data are retained. If an access cover is open or loose, this will also cause an emergency stop condition. Usually two conditions can cause the emergency stop indicator to light:

- a. Emergency stop button is pressed.
- b. Access cover is opened.

533 Emergency Shutdown Procedures

The emergency shutdown procedures below are performed by the supervisor and operator, as indicated:

- a. Press the emergency stop switch on the power panel (supervisor) or on the operator control box at the induction station (operator) or any of the emergency stop buttons located at every other module along the sort distribution section (sweeper). All emergency stop switches are within 4 feet of any position on the SPBS. When pressed, all mechanical operations will stop.

- b. To reset an engaged emergency stop switch, pull up the head of the switch system (supervisor or operator).

- c. To restart the machine after resetting the emergency stop switch, reset the power distribution circuitry and the software interrupts first by using the following procedure:

- (1) Press the emergency reset switch on the power distribution panel. The emergency stop indicator light goes out.

- (2) Turn the alarm reset keyswitch to reset the software interrupts.

- (3) The chain stop indicator light goes out.

- (4) Make sure all safety precautions are adhered to and the supervisor has given an "OK" signal before starting the machine.

- (5) The system can now be restarted in the normal manner.

Chapter 6

Management Information

610 System Manager

611 Definition

All transmissions between the master processor controller and the workstation are executed by using the system manager application software. Management information functions center around the supervisor computer workstation (PW/2). This software and workstation represents the user interface to the SPBS. As such, it allows the supervisor to obtain information to meet specific reporting needs. It is menu driven and provides system monitoring when the SPBS is operational. The system manager handles all transmissions between the MPC and the workstation. Any errors reported by the MPC are translated by the system manager and displayed on the workstation monitor. The SPBS system manager software provides for sort plan editing and transmission capabilities. It also provides sample run and volume run report capabilities, maintenance support functions, and diagnostics. When the SPBS is powered up in "auto" mode and the workstation switch and printer power switch is turned on, the system manager software systematically downloads the operational code and configuration for all CPUs in the system. SPBS configurations are preloaded into the hard disk of the master controller computer workstation at the factory as default conditions for a site. The MPC contains operating procedures for SPBS normal operations. All procedures are executed at the PW/2 workstation using the system manager. The SPBS system provides report generation capabilities at the supervisor and administrator menu levels. The reports provide an account of machine utilization, system performance and operation, and induction station/operator performance for full run and sample time periods. Reports provided from the supervisor menu are generated on-line (i.e., while the chain is running); reports provided from the administrator menu are generated off-line (i.e., while the chain is stopped). See Exhibit 611 for a system manager menu tree (flowchart).

612 User Access

612.1 General. The SPBS supports two methods for generating reports:

a. On-line. Auto/Maint/Jog keyswitch is in the "auto" position and carrier cell chain is running. All reports and programs on the supervisor menu are executed on-line.

b. Off-line. Auto/Maint/Jog keyswitch is in the "auto" position and the carrier cell chain is stopped. All sort plan operations, reports (excluding supervisor menu), utilities, configuration, maintenance, and diagnostics menus are executed off-line.

612.2 Procedures

612.21 General. The procedures in this section assume the SPBS system manager application software is already loaded and both the workstation and printer power are on.

612.22 Menu Options. To access the various menu options use the following:

- a.* Use the arrow keys and press the return or enter key.
- b.* Enter the first letter of the option and press the return or enter key.

612.23 Command Notations

- a. Brackets.* Brackets denote keyboard entry or a specific key to be pressed. Only enter the contents of the brackets not the brackets themselves.
- b. (CR).* Indicates that the return or enter key must be pressed to enter data.
- c. (ESC).* Escape key is used to return to the prior menu.
- d. File Name.* The name of file in use.

612.24 Input Descriptions. The following tools are used to enter and generate information:

- a. Settings.* Shows proper input parameters for entering at prompt(s) on screen display.

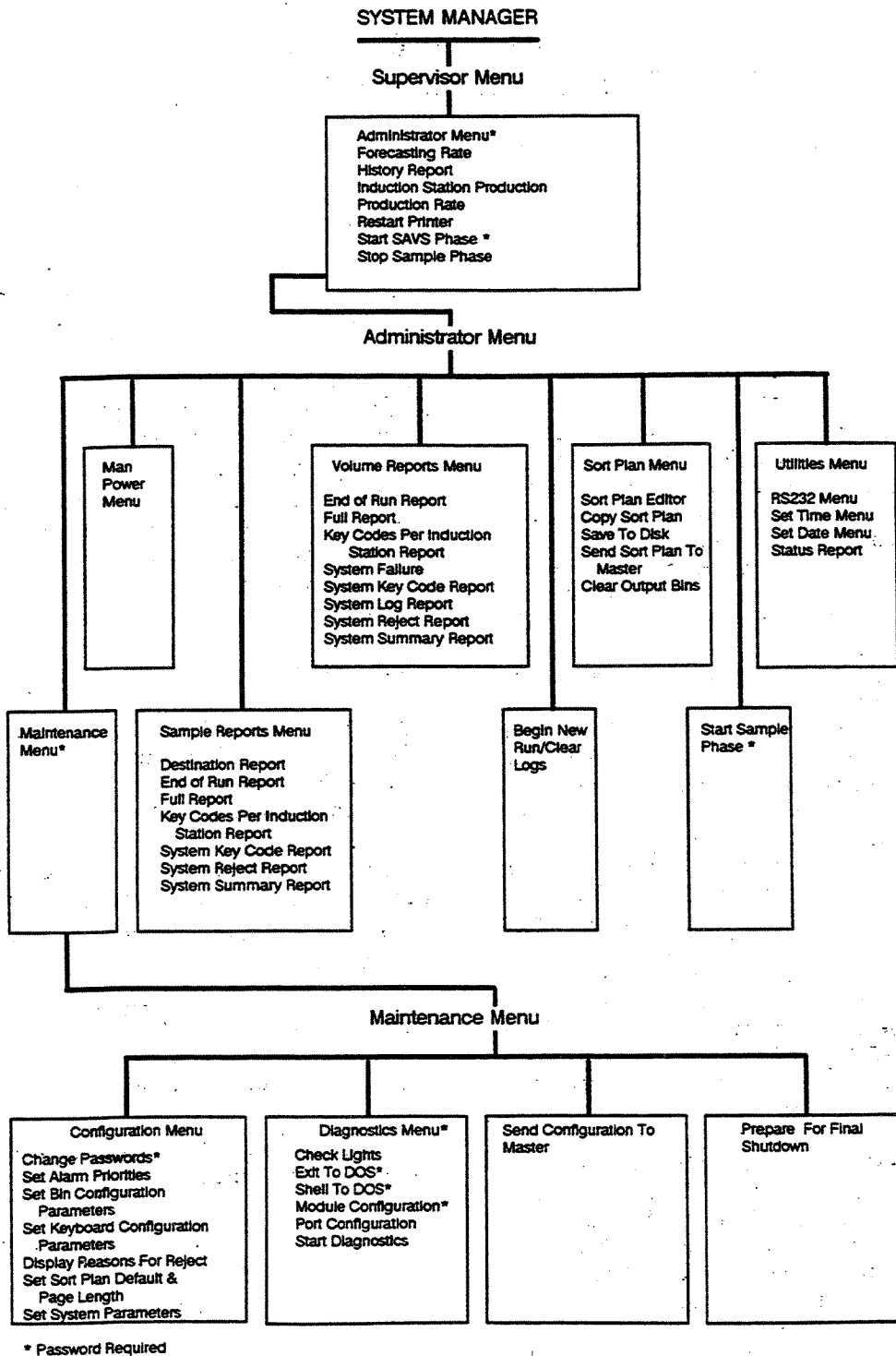


Exhibit 611, System Manager Menu Tree

b. *Enter or return key (CR)*. Used to enter data for operations and to move cursor from entry to entry (vertically). Designated by (CR) in the procedures.

c. *Arrow keys*. Used to move cursor from entry to entry (horizontally and vertically).

d. *Password*. A valid password is necessary for access to certain menus and options. These include administrator menu; maintenance menu; start sample phase; diagnostic menu; change passwords; exit to DOS; shell to DOS; and module configuration. Must use (CR) to enter password.

e. *Help key*. Pressing function key F1 displays an explanation of the selected menu in reverse video.

620 Supervisor Menu

621 Definition

The supervisor menu is the first menu that appears on the system manager screen after startup. It allows access to graphic, instantaneous production reports (such as induction station production and production rate reports). The supervisor menu also provides a report that allows a look at previous production (history report) and future production (forecasting rate report). This is a vital tool for assisting supervisors in accomplishing daily objectives. This menu branches to the administrator menu and the maintenance menu in addition to other menus and programs. It also accesses reports. Several of these menus and options are password protected. The system password is required to change the other passwords on the system. A request for password is indicated by a window prompt that appears on the screen. When an invalid password is entered, an error message is displayed. For security reasons, passwords are not displayed on the window prompt or on the change password menu. All supervisor menu options are executed on-line, i.e., while the carrier chain is running. Following is a sample supervisor menu screen:

```

Supervisor Menu
Administrator Menu
Forecasting Rate
History Report
Induction Station Production Report
Production Rate Report
Restart Printer
Start SAVS Phase
Stop Sample Phase
  
```

622 User Access

This section describes the SPBS reports that appear on the supervisor menu. These reports are generated on-line (i.e., while the chain is running) and prints only what is actually being shown on the screen (using the print screen key). To access these reports, use the arrow keys to move the cursor to desired reports and press the return key.

623 Supervisor Menu Options

623.1 Forecasting Rate Report. This report generates a graphic display of anticipated volume forecasted from the present time up to the next four hours. Data for this report is based on maintaining current keying rates, which are updated every five minutes. This report can only be generated on-line while the chain is running. To generate this report:

- a. Ensure that the supervisor menu appears on the screen.
 - b. Select the "forecasting rate report" option.
 - c. Graph is displayed.
 - d. Press ESC to return to supervisor's menu.
- See Exhibit 623.1 for a sample forecasting rate report.

623.2 History Report. This report provides a graphic display of system production rate from an hour ago to the present time. It plots the volume processed during that hour and is updated every five minutes. This report can only be generated on-line while the chain is running. To generate the report:

- a. Ensure that the supervisor menu appears on the screen.
 - b. Select the "history report" option.
 - c. Graph is displayed.
- See Exhibit 623.2 for a sample history report.

FORECASTING PRODUCTION

MODE: VOLUME
PLAN: TRAINER.IN

DATE: 09-19-1989
TIME: 08:58:39

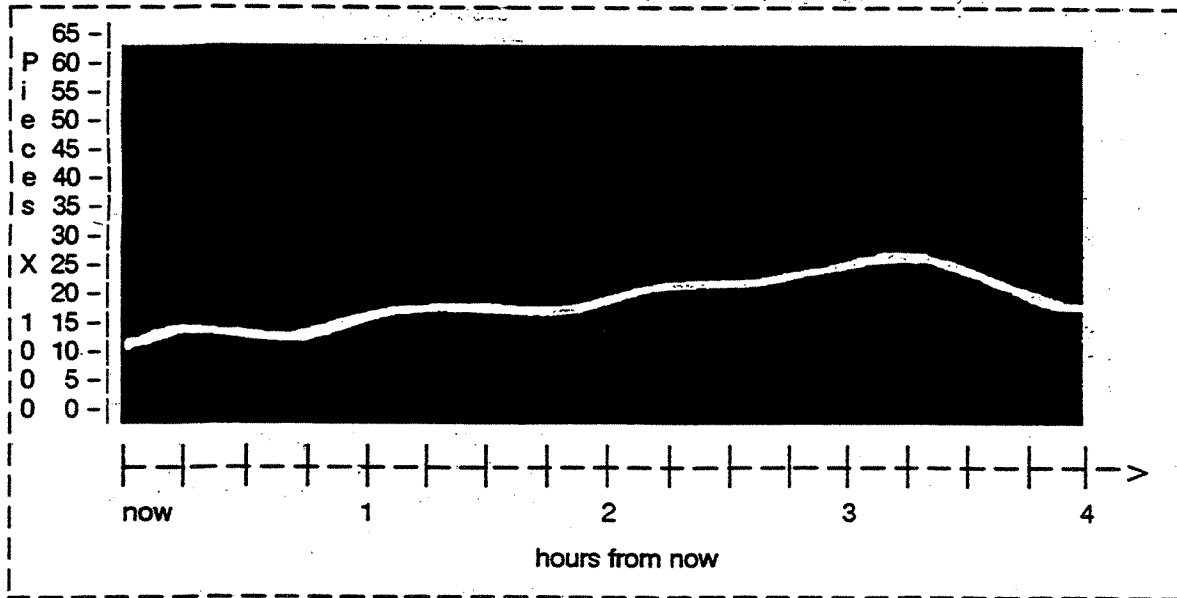


Exhibit 623.1, Sample Forecasting Rate Report

MODE: VOLUME
PLAN: TRAINER.IN

DATE: 09-19-1989
TIME: 10:50:22

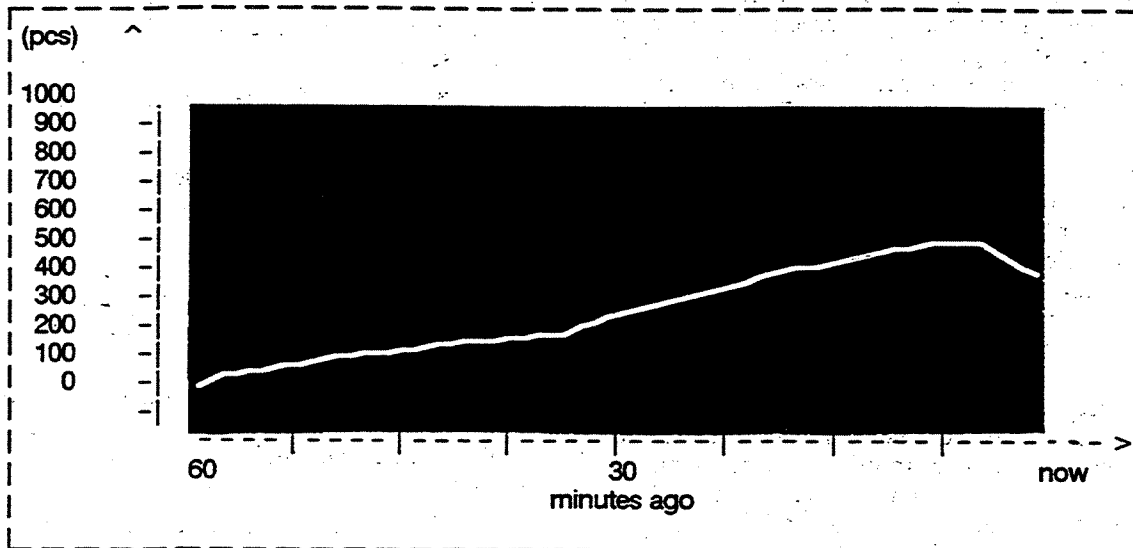


Exhibit 623.2, Sample History Report

623.3 Induction Station Production Report. The induction station production report provides production rate data for each induction station. It shows the total number of pieces keyed, rejected and the current production rate of mailpieces keyed and rejected on each induction station. The current production rate per minute is obtained by dividing the total processed by the total run time. This report can only be generated on-line while the chain is running. To generate report:

- Ensure that the supervisor menu appears on the screen.
- Select the "induction station production rate report" option.
- I.S. production report is displayed.

See Exhibit 623.3 for a sample induction station production rate report.

623.4 Production Rate Report. The production rate report provides graphic production rate data for the entire system. This is a valuable tool for monitoring keying performance. The right side of the report gives a dynamic bar graph for all induction stations. This area shows the induction flow per minute for each induction station. This report also shows the total pieces keyed for all

induction stations as well as the total production rate for the last 20 minutes. The left side of the report gives a graphic depiction of the SPBS machine layout. If any run-time faults or system alarms occur in the system, the corresponding area of the diagram is highlighted in red. This report can only be generated on-line while the chain is running. To generate this report:

- Ensure that the supervisor menu appears on the screen.
- Select the "production rate report" option.
- Press ESC to return to supervisor's menu.

Note: A hardcopy of this report can be obtained by pressing the "print screen" key.

See Exhibit 623.4 for a sample production rate report.

623.5 Restart Printer. This program turns the printer on-line if currently off-line, assuming the printer power on switch is set to the on position and the on-line indicator is lit (green). No run time header is printed. This report can only be executed on-line. To generate this report:

		I.S. Production						
MODE: VOLUME								DATE: 09-19-1989
PLAN: SIMPLE.IN								TIME: 08:59:04
	SPBS	I.S. 1	I.S. 2	I.S. 3	I.S. 4	I.S. 5	I.S. 6	
Total:								
pcs keyed	3685	505	700	600	650	550	680	
pcs rej	150	20	28	27	25	26	24	
Current								
Rate:								
tot per min	132	18	24	27	17	21	25	
pcs rej	4	0	1	2	0	0	1	

Exhibit 623.3, Sample Induction Station Production Rate Report

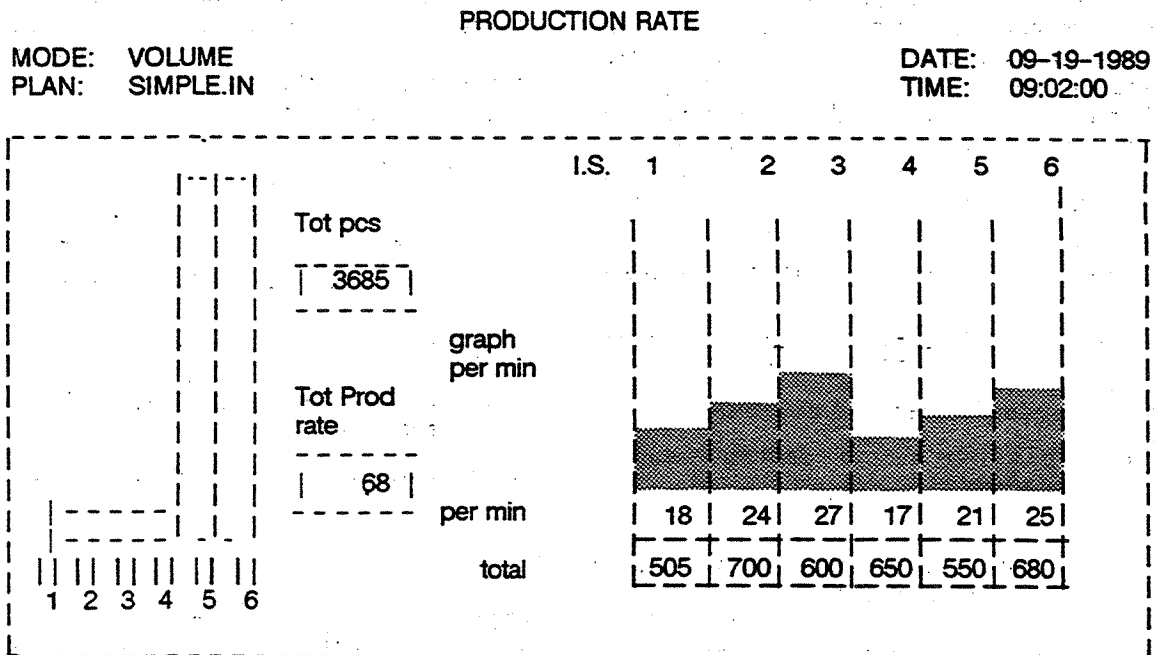


Exhibit 623.4, Sample Production Rate Report

- Ensure that the supervisor menu appears on the screen.
- Select the "restart printer" option.
- Observe that printer restarts.

Administrator Menu

Maintenance Menu
Manpower Menu
Sample Reports Menu
Volume Reports Menu
Begin New Run/Clear Logs
Sort Plan Menu
Start Sample Phase
Utilities Menu

630 Administrator Menu

631 Definition

This menu is found on the supervisor menu and is password protected. All administrator menu options are executed off-line, i.e., while the carrier cell chain is stopped. Following is a sample administrator menu screen:

632 User Access

To display the administrator menu on the screen:

- Highlight the administrator menu option on the supervisor menu and press (CR).
- Enter a valid password and press (CR).
- The menu is displayed. Use the (ESC) key to return to the previous menu level, if necessary.

633 Administrator Menu Options

633.1 Manpower Menu

633.11 General. The manpower menu is updated at the end of each mail run (i.e., every time a sort plan ends or at the end of the day or shift).

These values are read by the program which generates the end-of run report on machine utilization and productivity. This program can only be executed off-line. To execute:

- a. Ensure that the administrator menu appears on the screen.
- b. Select the "manpower menu" option.
- c. The manpower menu appears on the screen.
- d. Set manpower menu, as required.

Following is a sample manpower menu:

Manpower Menu		
Set Manpower	Input Type	Number of People
Set Manpower	Value	99.9

633.12 Input Field Description Following is a description of requested information:

- a. *Man power input type.* Use the left and right arrow keys to set the parameter at one of two available input type options: number of people or total workhours. Enter the number of people or total workhours.
- b. *Number of people.* Enter the total number of people working with the machine during the sort plan run. This figure correlates to workhours for the end of run report. Maximum acceptable value is 99.9.
- c. *Total workhours.* For total workhours, multiply the number of employees working on the sort plan by the total processing time for that sort plan run. Maximum acceptable value is 999.9.
- d. *Enter setting.* Use (CR) to enter the setting and the manpower value.
- e. *Press (ESC).* Manpower setup is complete. Administrator menu is displayed.

633.2 Sample Reports Menu

633.21 General. The following sections describe each report on the sample reports menu. Selecting any of the reports listed in this menu will access and print the data compiled during the sample run phase only. This data will not be included in the volume reports. All sample re-

ports are generated off-line (i.e., while the carrier cell chain is stopped). Following is a sample sample reports menu:

Sample Reports Menu
Destination Report
End of Run Report
Full Report
Key Codes per Induction Station Report
System Key Code Report
System Reject Report
System Summary Report

633.22 User Access. To display the sample reports menu on the screen:

- a. Highlight the administrator menu option on the supervisor menu and press (CR).
- b. Enter a valid password and press (CR).
- c. Highlight the sample reports menu and press (CR). The menu is then displayed on the screen. Use the (ESC) key to return to the previous menu level, if necessary.

633.23 Destination Report. The destination report provides bin density information. This report tracks the weight and number of mailpieces sorted to each bin per keycode. This report can only be generated off-line. To generate the report:

- a. Ensure that the sample reports menu appears on the screen.
- b. Select the "destination report" option.
- c. The destination report starts printing.

See Exhibit 633.23 for a sample destination report.

633.24 End-of-Run Report

633.241 General. The end-of-run report (also available on volume reports menu) provides productivity data for each induction station and the entire machine. It shows the overall efficiency of each run based on the following data:

- a. *Throughput.* Total pieces processed per induction station operational time (hours).
- b. *Productivity.* Pieces processed per work hour based on the manpower input type and value.

System Destination Report (Sample Run)		
Machine ID	:INPLANT	
Office ID	:UNISYS	
Sort Plan	:SIMPLE.IN	Out Date : 09-19-1989
Start Time	:15:15:45	Stop Time : 16:18:09
Total Run Time : 1 Hours 2 Minutes 24 Seconds		
Total Mail Pieces Sorted : 3535		
Induction Station	Mail Pieces Processed	
1	505	
2	700	
3	600	
4	650	
5	550	
6	680	
Destination Report		Page: 1
Bin # 1	Key Code	Weight
	001	1.1
	001	1.1
Total Mail Pieces: 2		Total Weight: 02.2
Bin # 2	Key Code	Weight
	002	2.2
	002	2.2
Total Mail Pieces: 2		Total Weight: 4.4
Bin # 3	Key Code	Weight
	003	1.1
	003	2.2
	003	3.3
Total Mail Pieces: 3		Total Weight: 6.6
Bin # 4	Key Code	Weight
Total Mail Pieces: 1		Total Weight: 0.0
Bin # 5	Key Code	Weight
Total Mail Pieces: 0		Total Weight: 0.0
Bin # 6	Key Code	Weight
•		
•		
•		
Total Mail Pieces: 0		Total Weight: 0.0
Bin # 100	Key Code	Weight

Exhibit 633.23, Sample Destination Report

c. Machine Utilization. Induction station operational time in hours per total run time.

Note: Prior to generating this report, ensure that the manpower menu is set for the desired mode: number of people or total workhours. This report can only be generated off-line.

633.242 User Access

- a. Ensure that the sample reports menu appears on the screen.
- b. Select the "end-of-run report" option.
- c. Observe the printing of the end-of-run report on the printer.

See Exhibit 633.242 for a sample end-of-run report.

633.25 Full Report. The full report (also available on volume reports menu) gives the key code and destination data (cell and weight) for each mailpiece processed per induction station. This report can only be generated off-line. To generate the report:

- a. Ensure that the sample reports menu appears on the screen.
- b. Select the "full reports" option.
- c. Observe the printing of the full report on the printer.

See Exhibit 633.25 for a sample system full report.

633.26 Key Code Per Induction Station Report.

This report (also available on volume reports menu) lists the mailpieces processed per induction station and lists sequentially the keystrokes entered for each induction station. The MPC keeps a record of all keycodes entered on each induction station and generates this information through the PW/2. This report can only be generated off-line. To generate the report:

- a. Ensure that the sample reports menu appears on the screen.
- b. Select the "keycode per induction station report" option.
- c. Observe the printing of the induction station key code report to the printer.

See Exhibit 633.26 for a sample key code per induction station report.

633.27 System Key Code Report. The system key code report (also available on the volume reports menu) lists the mailpieces processed under each

key code per induction station. This report can only be generated off-line. To generate the report:

- a. Ensure that the sample reports menu appears on the screen.
- b. Select the "system key code report" option.
- c. Observe the printing of the key code report on the printer.

See Exhibit 633.27 for a sample system key code report.

633.28 System Reject Report. The system reject report (also available on the volume reports menu) shows the number of mailpieces sorted to the reject bin per keycode and lists the reasons for reject of a mailpiece. This report can only be generated off-line. To generate the report:

- a. Ensure that the sample reports menu appears on the screen.
- b. Select "system reject report" option.
- c. Observe the printing of the system reject report on the printer.

See Exhibit 633.28 for a sample system reject report.

633.29 System Summary Report. The system summary report (also available on the volume reports menu) shows the total number of mailpieces processed by each induction station to a specific destination bin, including reject and missent mailpieces. This report can only be generated off-line. To generate the report:

- a. Ensure that the sample reports menu appears on the screen.
- b. Select the "system summary report" option.
- c. Observe the printing of the system summary report on the printer.

See Exhibit 633.29 for a sample system summary report.

633.3 Volume Reports Menu

End of Run Report (Sample Run)							
Machine ID : INPLANT							
Office ID : UNISYS							
Sort Plan : SIMPLE.IN							
Out Date : 09-19-1989							
Start Time : 15:15:45							
Stop Time : 16:15:45							
Total Run Time : 1 Hours 0 Minutes 0 Seconds							
End of Run Report (Sample Run)							
	Induction Station						Total
	1	2	3	4	5	6	SPBS
Total Pieces Processed:	505	700	600	650	500	680	3685
I.S. Op Time (Hours):	0.8	1.0	1.0	1.0	8.0	1.0	5.6
Throughput (Pieces/Hour):	631	700	600	650	687	680	3685
Productivity (Pieces/Workhour):							368.5
Machine Utilization: (Induction Station Op Time/Total Run Time)	80%	100%	100%	100%	80%	100%	93%

Exhibit 633.242, Sample End-of-Run Report

System Full Report (Sample Run)							
Machine ID : INPLANT		Office ID : UNISYS		Sort Plan : SIMPLE.IN		Out Date : 09-20-1989	
Start Time : 15:15:45		Total Run Time : 0 Hours 2 Minutes 24 Seconds		Total Mail Pieces Sorted: 45		Stop Time : 15:18:09	
Induction Station				Mail Pieces Processed			
1				5			
2				5			
3				27			
4				2			
5				3			
6				3			
Full Report (Sample Run)							Page: 1
Seq #	Code	IS	Int	Act	Cell	Weight	Reason for Reject
1	012	3	12	12	0	0.0	
2	012	2	12	101	10	5.5	Bin Being Swept
3	003	3	3	3	22	1.3	
4	058	5	58	58	28	0.9	
5	058	3	58	58	34	0.4	
6	069	6	69	69	51	1.7	
7	058	3	58	58	59	0.6	
8	058	1	58	58	64	0.7	
9	058	4	58	58	69	0.4	
10	058	2	58	58	75	1.2	
11	058	6	58	58	80	9.8	
•							
•							
•							

Exhibit 633.25, Sample System Full Report

System Key Code Report (Sample Run)	
Machine ID : INPLANT	
Office ID : UNISYS	
Sort Plan : SIMPLE.IN	Out Date : 09-19-1989
Start Time : 12:00:00	Stop Time : 01:45:05
Total Run Time : 1 Hours 45 Minutes 05 Seconds	
Total Mail Pieces Sorted: 6116	
Induction Station	Mail Pieces Processed
1	969
2	739
3	1609
4	710
5	788
6	1301
Key Code Report (Sample Run) for Induction Station 1	
Page: 1	
Seq #	Key Code
1	012
5	012
10	013
13	012
17	013

Exhibit 633.26, Sample Key Code Per Induction Station Report

System Key Code Report (Sample Run)		
Machine ID : INPLANT Office ID : UNISYS Sort Plan : SIMPLE.IN Start Time : 15:15:45 Total Run Time : 1 Hours 2 Minutes 24 Seconds Total Mail Pieces Sorted: 3535		
		Out Date : 09-19-1989 Stop Time : 16:18:09
Induction Station	Mail Pieces Processed	
1	505	
2	700	
3	600	
4	650	
5	550	
6	680	
System Key Code Report (Sample Run)		Page: 1
Seq #	Key Code	Mail Pieces Processed
1	001	1
2	002	2
3	003	2
4	004	1
5	005	1
6	006	1
7	007	1
8	008	1
9	009	1
10	010	1
11	011	1
12	012	3
13	013	1
14	014	1
15	015	1
16	016	1
17	017	1
18	018	1
19	019	1
20	020	1
•		
•		
•		

Exhibit 633.27, Sample System Key Code Report

System Reject Report (Sample Run)			
Machine ID : INPLANT		Out Date : 09-19-1989	
Office ID : UNISYS		Stop Time : 16:18:09	
Sort Plan : SIMPLE.IN			
Start Time : 15:15:45			
Total Run Time : 1 Hours 2 Minutes 24 Seconds			
Total Mail Pieces Sorted: 3535			
Induction Station		Mail Pieces Processed	
1		505	
2		700	
3		600	
4		650	
5		550	
6		680	
System Reject Report (Sample Run)		Page: 1	
Seq #	Key Code	Mail Pieces Processed	Reason for Reject
1	002	2	Bin Being Swept
2	004	1	Bin Being Swept
3	010	1	Bin Being Swept
4	012	2	Bin Being Swept

Exhibit 633.28, Sample System Reject Report

System Summary Report (Sample Run)			
Machine ID . INPLANT :		Out Date : 09-19-1989	
Office ID . UNISYS :		Stop Time : 16:18:09	
Sort Plan . SIMPLE.IN :			
Start Time . 15:15:45 :			
Total Run Time . 1 Hours 2:Minutes 24 Seconds			
Total Mail Pieces Sorted: 3535			
Induction Station		Mail Pieces Processed	
1		505	
2		700	
3		600	
4		650	
5		550	
6		680	
System Summary Report (Sample Run)		Page: 1	
Destination		Mail Pieces Processed	
1		5	
2		10	
3		5	

Exhibit 633.29, Sample System Summary Report

633.31 General. This section describes the reports on the volume reports menu. Selecting any of the reports listed in this menu will generate the report for the entire volume run in the last sort plan. All volume reports are generated off-line, i.e., while the carrier cell chain is stopped. Most of the reports on this menu are duplicated in the sample reports menu and have the same title. For this reason, only two reports unique to this particular menu are described in this section. Following is a sample volume reports menu:

Volume Reports Menu
*End of Run Report
*Full Report
*Key Codes Per Induction Station Report
System Failure
*System Key Code Report
System Log Report
*System Reject Report
*System Summary Report

*Described in sample reports menu.

633.32 User Access. To display the volume reports menu on the screen:

- a. Highlight the administrator menu option on the supervisor menu and press (CR).
- b. Enter a valid password and press (CR).
- c. Highlight the volume reports menu and press (CR).
- d. The menu is then displayed on the screen.
- e. Use the (ESC) key to return to the previous menu level, if necessary.

633.33 System Failure Report. The system failure report lists system failures and the number of occurrences during the run (or since the last clearing of data from the system or log clear). It also tracks the amount of downtime associated with each failure occurrence. This report can only be generated off-line. To generate the report:

- a. Ensure that the volume reports menu appears on the screen.
- b. Select the "system failure report" option.
- c. Observe the printing of the system failure report on the printer.

See Exhibit 633.33 for a sample system failure report.

633.34 System Log Report. The system log report lists system operational errors, including power failures, emergency stops, system problems and carrier cell failures since the last clearing of data. Each event is logged by time of occurrence and is assigned an alarm priority rating. This report can only be generated off-line. To generate the report:

- a. Ensure that the volume reports menu appears on the screen.
- b. Select the "system log report" option.
- c. Observe the printing of the system log report on the printer.

See Exhibit 633.34 for a sample system log report.

633.4 Begin New Run/Clear Logs. This program clears all data collected for the last sort run. Whenever this option is selected, it begins a new sortation process.

Note: Prior to starting this program, ensure that all reports are generated. This program can only be executed off-line.

To execute this report:

- a. Ensure that the administrator menu appears on the screen.
- b. Select the "begin new run/clear logs" option.
- c. Enter (Y) and press (CR) to clear logs.
- d. Confirmation message window appears: "Logs Cleared, Ready for New Run."
- e. Press (ESC).
- f. The administrator menu is displayed.

Following is a sample begin new run/clear logs menu:

Clear Logs
Enter Y to Clear Logs:

633.5 Sort Plan Menu

633.51 General. The sort plan menu provides sort plan editing and generating capabilities as well as plan storage and loading for the SPBS system. The sort plan capability is designed to allow as much flexibility as possible for individual

System Failure Report (Volume Run)			
Machine ID :	INPLANT		
Office ID :	UNISYS		
Sort Plan :	SIMPLE.IN	Out Date :	09-18-1989
Start Time :	14:35:46	Stop Time :	14:46:04
Total Run Time :	0 Hours 10 Minutes 18 Seconds		
	Total Mail Pieces Sorted: 6116		
System Failure Report		Page: 1	
Seq #	Description	Number	Tot Time (m)
1	Emergency Switch Struck	1	8

Exhibit 633.33, Sample System Failure Report

System Log Report (Volume Run)						
Machine ID :	INPLANT					
Office ID :	UNISYS					
Sort Plan :	SIMPLE.IN					
Start Time :	14:35:46					
Total Run Time :	0 Hours 0 Minutes 24 Seconds					
	Total Mail Pieces Sorted: 6116					
System Log Report					Page: 1	
Seq #	Unit	Alr. #	Description	Date	Time	Pri
1	IS-3	25	Weight Not Ready Yet	09-18-1989	14:33:19	1
2	IS-3	28	Fault Code <28>	09-18-1989	14:38:36	1
3	SC-6	98	Driver Board Test Result	09-18-1989	14:40:29	1

Exhibit 633.34, Sample System Log Report

offices to tailor sort plans to their specific needs. In order to utilize this flexibility, the mail type, destination bin assignments, keycodes and their relationships must all be considered. The SPBS sort plan uses alphanumeric keycodes up to five digits (actual keyhits input by the operator) to access a bin location through a look-up table. These keycodes may be actual ZIP Codes or some relation to a ZIP Code or mail type, dependent upon the local office design. For example, the operator could key all 5 digits of the zip code, or the first three digits, or a function key (F1, F2, F3, or F4) and the last 2 digits, where the function key represents the mail type (i.e., letter bundles or flats). Note that the F1-F4 function keys on the operator keyboard represent alpha designations, such that F1 key = A, F2 key = B, F3 key = C, and F4 key = D. Specific values can also be assigned to the operator keyboard's four function keys (F1, F2, F3, F4). For example, F1 may represent a grouping of numbers, such as a ZIP Code (e.g., F1 = 19301, F2 = 19382.). Thus a single function key could be used to induct mail. The value assigned to a function key may be as many digits in length as the keyhit plan. This means that in a 5 digit sort plan, a function key value may equal 1, 2, 3, 4, or 5 digits. In such a plan, if the value is less than the full five digits, additional keystrokes would be necessary to induct mailpieces. In the SPBS system only one sort plan can be selected at a time. All induction stations use the same sort plan. The SPBS sort plan menu is found on the administrator menu. All sort plans are generated and manipulated off-line, i.e., while the carrier cell chain is stopped. Following is a sample sort plan menu:

Note: The sort plan function keys are accessible from all sort plan submenus. These function keys are helpful for use with the sort plan editor menu.

Sort Plan Menu

```
Sort Plan Editor
Copy Sort Plan
Save to Disk
Send Sort Plan to Master
Clear Output Bins
```

633.52 User Access. To display the sort plan menu from the supervisor menu:

- a. Highlight the administrator menu and press (CR).
- b. Enter a valid password and press (CR).

- c. Highlight the sort plan menu and press (CR). The menu is then displayed on the screen.

- d. Use the (ESC) key to return to the previous menu level, if necessary.

633.53 Sort Plan Editor

633.531 Submenu 1 - Sort Plan Type and Name.

The SPBS sort plan editor is used to create and edit plans for the SPBS. When creating a plan, there are several options which must be selected before keycodes are entered. The first submenu allows you to designate the sort plan type and to name the plan. The four sort plan types are:

- a. IN - Incoming mail (.IN)
- b. OUT - Outgoing mail (.OU)
- c. MIX - Incoming and Outgoing mail (.MI)
- d. TEST - Testing Purposes (.TE)

Note: Prior to starting this procedure, ensure that the SPBS is off-line (chain must be stopped).

Following is a sample sort plan editor menu:

SORT PLAN EDITOR

```
SORT PLAN TYPE: IN OUT MIXED TEST
SORT PLAN FILE NAME:
```

633.532 User Access. To access the sort plan editor menu:

- a. Ensure that the sort plan menu is displayed on the screen.
- b. Select "the sort plan editor" option.
- c. Sort plan editor menu appears.
- d. Enter the sort plan type and name:
 - (1) Type = IN, OUT, MIX, TEST. Use right or left arrow key to select the type until the correct type is highlighted, then press (CR).
 - (2) Filename = 1-8 alphanumeric character name.
 - e. To edit an existing file, enter the file name, then press (CR).
 - f. To create a new file, press (CR):
 - (1.) Enter new file name and (CR).
 - (2.) Enter valid reply and (CR) to the message "File does not exist. Do you wish to create it? (Y/N)."

Note: Press N and (CR) to enter a new file name if the file name entered is incorrect.

(3.) Press Y and (CR). Submenu 2 is displayed.

633.533 Submenu 2 - Sort Plan Configuration.

This screen allows you to designate the following: keycode format (number and type of keyhits), missent bin number and container type, and function key designation. Observe the confirmation window display message "Do you want to change these values? (Y/N)." Type N (CR). Submenu 3 is displayed. Type Y (CR) to change the values. See Exhibit 633.533 for a sample sort plan configuration.

633.534 Submenu 3 - Bin Configuration and Compilation. This screen allows you to enter a new sort plan or edit an existing sort plan. The columns of the bin configuration display include:

- a. *An error message column.*
- b. *Sequence number column.* Each sort plan line has its own sequence number.
- c. *Codes A and B ranges column.* Beginning and end of an inclusive range of keycodes.
- d. *Destination assignment column.* Bin destination number and container type-tray, sack, U-cart, or wiretainer.
- e. *Comments column.* A weight limit can be specified separately for each bin in the system. Depending on the container type, maximum weight values between 20 pounds and 200 pounds can be assigned, as well as the wiretainer with no weight limit. There are thirty different container type/weight values available in this section of the sort plan. Each value is a two character code. The first letter indicates the container type (T-tray, S-sack). The second character indicates the maximum weight limit for that bin. A list of container types can be displayed in the sort plan editor by pressing the F8 function key. The destination assignment part of the sort plan is sent to the SC upon initialization (download and is container specific). The SC needs this information to determine whether or not to keep weight data for a particular output destination. For example, if the destination is classified as a sack, tray, or U-cart, the SC will keep weight data. But if the destination is classified as a wiretainer with no weight limit, the SC will not keep the weight data. When the sort plan is successfully compiled, the compiled code is automatically saved to the hard disk. Whenever an existing sort plan is edited, it must

be compiled (physically using F6 to compile) to ensure that the proper information is sent to the MPC. See Exhibit 633.534 for a sample bin configuration/compilation menu and valid container types screen.

633.54 Copy Sort Plan. This program is a hard disk copy option used to copy the file to a file with another name, another type (i.e., in, out, mix, or test) or overwrite one existing file with another. To execute:

- a. Ensure that the sort plan menu is displayed.
- b. Select "copy sort plan."
- c. Enter sort plan type and name.
- d. Confirmation window appears.
- e. Press (ESC). Sort plan copy is complete and sort plan menu is displayed.

Following is a sample copy sort plan menu:

Copy Sort Plan	
From Sort Plan type	in
From Sort Plan name	
To Sort Plan type	in
To Sort Plan name	

633.55 Save Sort Plan on Disk. This program allows the sort data to be saved on a floppy diskette. The diskette must be formatted and inserted into the drive of the PW/2 prior to entering data. Following is a sample save sort plan on disk menu:

Save Sort Plan on Disk	
From Sort Plan Type	in
From Sort Plan name	
To Sort Plan type	in
To Sort Plan name	

633.56 Send Sort Plan to Master

633.561 General. This program allows the loading of a new sort plan to the MPC. It sends the sort plan (parameters and information) to the master controller in less than two minutes. Prior to downloading a new sort plan, ensure:

SORT PLAN EDITOR	
KEY CODE FORMAT : NNNNN	FILE NAME : FAC.IN
<p>Key Code Format: NNNNN</p> <p>Missent Bin Number: 101</p> <p>Missent Bin Container (T/W): T</p> <p>F1 Key: A</p> <p>F2 Key: B</p> <p>F3 Key: C</p> <p>F4 Key: D</p> <p>Do you want to change these values? (Y/N)</p>	

Exhibit 633.533, Sample Sort Plan Configuration

SORT PLAN EDITOR				
KE	Valid Container Types			TE
ER				
	<i>Trays</i>	<i>Sacks</i>	<i>U-Carts</i>	<i>Wiretainers</i>
	TA 20 lbs	SA 20 lbs	U1 75 lbs	W6 200 lbs
	TB 25 lbs	SB 25 lbs	U2 100 lbs	W7 no weight limit
	TC 30 lbs	SC 30 lbs	U3 125 lbs	
	TD 35 lbs	SD 35 lbs	U4 150 lbs	
	TE 40 lbs	SE 40 lbs	U5 175 lbs	
	TF 45 lbs	SF 45 lbs	U6 200 lbs	
	TG 50 lbs	SG 50 lbs		
	TH 55 lbs	SH 55 lbs		
	TI 60 lbs	SI 60 lbs		
	TJ 65 lbs	SJ 65 lbs		
	TK 70 lbs	SK 70 lbs		

ESC Exit F1 Help F2 Insert F4 Print F5 Next Error
 F6 Compile F7 Save F8 Containers F9 Clear Line F10 Erase Line

SORT PLAN EDITOR						
KEYCODE FORMAT : NNN				FILE NAME : EXAMPLE.TE		
EER	SEQ #	CODE A	CODE B	DEST #	CONT	COMMENTS
	1	001		001	TI	Now Bin 1 is a 60 lb tray.
	2	002		002	TE	
	3	003		003	TE	
	4	004		004	TE	
	5	005		005	TI	So is Bin 5.
	6	006		006	TE	
	7	007		007	TE	
	8	008		008	TE	
	9	009		009	TE	
	10	010		010	TE	The others remain 40 lb trays.
	11	011		011	TE	
	12	012		012	TE	
	13	013		013	W7	Bins 13/15 are wiretainers.
	14	014		014	TE	Tray.
	15	015		015	W7	

ESC Exit F1 Help F2 Insert F4 Print F5 Next Error
 F6 Compile F7 Save F8 Containers F9 Clear Line F10 Erase Line

Exhibit 633.534, Sample Bin Configuration/Compilation Menu (and Valid Container Types Screen)

- a. All reports from last sort plan run have been generated.
- b. All bins have been swept.
- c. Weight data for bins has been cleared.

Following is a sample send sort plan to master menu:

Send Sort Plan To Master

Sort Plan type IN, OUT, MIX, or TEST

Sort Plan name

633.562 User Access

- a. Ensure that the sort plan menu appears on the screen.
- b. Select the "send sort plan to master."
- c. Enter sort plan type and name:
 - (1) Sort plan type = In, Out, Mix, or Test
 - (2) Sort plan name = Eight characters maximum
- d. Use the right and left arrow keys to select the sort plan type and press (CR). Enter the sort plan name and press (CR). The screen displays a list of information which will be sent to the MPC.
- e. Use (CR) to enter data.
- f. Confirmation window displays three messages, one at a time:
 - (1) "Downloading Sort Plan (Name.Type)"
 - (2) "Sort Plan (Name.Type)"
 - (3) "Logs Cleared, Ready for New Run"
- g. Press (ESC). Sort plan menu is displayed.

633.57 Clear Output Bins. This program sends a message to the master processor controller to clear the weight register data in the section controllers. The weight data should be cleared any time there is a system-wide sweep of the bins. This program can only be executed off-line. To execute:

- a. Ensure the sort plan menu appears on the screen.
- b. Select the "clear output bins" option.
- c. Press (ESC).
- d. The sort plan menu is displayed.

Following is a sample clear output bins menu:

Weight Data has been Cleared

634 Utilities Menu

634.1 General. The utilities menu is shown in exhibit 634.1. This menu is found on the administrator menu. All utilities menu options are executed off-line, i.e., while the carrier cell chain is stopped. Following is a sample utilities menu:

Utilities Menu

RS232 Menu
Set Time Menu
Set Date Menu
Status Report

634.2 User Access. To display the utilities menu on the screen:

- a. Highlight the administrator menu option on the supervisor menu and press (CR).
- b. Enter a valid password and press (CR).
- c. Highlight the utilities menu option and press (CR).
- d. The menu is displayed on the screen. Use the (ESC) key to return to the previous menu level, if necessary.

634.3 RS232 Menu. This program is used to select the baud rate value for the RS232 interface. Allowable values are 300, 600, 1200, 2400, 4800, and 9600. This program can only be executed off-line.

634.4 Set Time Menu. This program is used to enter a new time. All values for the three time parameters -- hour, minute, and second -- must be entered to change the time. This program can only be executed off-line. To execute:

- a. Ensure the utilities menu appears on the screen.
- b. Select the "set time menu" option.
- c. Enter the following time setting:
 - (1) Hour = Valid range is 0-23.
 - (2) Minute = Valid range is 0-59.
 - (3) Second = Valid Range is 0-59.

- d. Press (CR) to enter values.
- e. Press (ESC). Set time is complete.
- f. Utilities menu is displayed.

Following is a sample set time menu:

```

-----Set Time Menu-----
Set Hour
Set Minute
Set Second
  
```

634.5 Set Date Menu. This program is used to enter a new date. All values for the three date parameters -- month, date, and year -- must be entered to change the date. This program can only be executed off-line. To execute:

- a. Ensure the utilities menu appears on the screen.
- b. Select the "set date menu" option.
- c. Enter each of the following date settings:
 - (1) Month = Use left or right arrow keys to advance the month displayed to the present month.
 - (2) Date = Valid entries are 1-30, 1-28, or 1-31 (1-29 for leap year).
 - (3) Year = Valid entries are 1980 -2099 (must be four digits).
- d. Press (CR) to enter data.
- e. Press (ESC). Set date is complete.
- f. The utilities menu is displayed.

Following is a sample set date menu:

```

-----Set Date Menu-----
Set Month
Set Date
Set Year
  
```

634.6 Status Report. The status report shows mailpiece processing status data for a particular timeframe input by the supervisor. A specific time range or system manager default range (entire sort plan run time) may be selected. This report is sent over a RS232 line to another piece of SPBS equipment. It complies the same data as the system summary report and is available on a temporary file on the disk called "STATDATA.TMP". This report can only be

generated off-line, i.e., while the chain is stopped. To generate this report:

- a. Ensure that the utilities menu appears on the screen.
- b. Select the "status report" option.
- c. Enter begin report time and end report time and press (CR).
- d. Note that the status report is not displayed or printed out, but saved on file "STAT.DATA.TMP."

See Exhibit 634.6 for a sample status report.

640 Maintenance Menu

641 Definition

The maintenance menu is found on the administrator menu and is password protected. All maintenance menu options are executed off-line, i.e., while the carrier cell chain is stopped. Following is a sample maintenance menu:

```

-----Maintenance Menu-----
Configuration Menu
Diagnostics Menu
Send Configuration to Master
Prepare for Final Shutdown
  
```

642 User Access

To display the maintenance menu on the screen:

- a. Highlight the administrator menu option on the supervisor menu and press (CR).
- b. Enter a valid password and press (CR).
- c. Highlight the "maintenance menu" option and press (CR).
- d. Enter a valid password and press (CR). The menu is displayed.
- e. The (ESC) key returns you to the previous menu level.

643 Configuration Menu

643.1 General. It is necessary for the SPBS system to be configured with specific operating specifications before sorting takes place. SPBS system configurations are loaded onto the hard disk of the workstation during initial site installation as default conditions for a particular site. However, if these conditions change, the new

STATUS REPORT DATA ENTRY

Use "↑", "↓", "→", and "←" to move, Return to accept & ESC to Exit

Enter Start and End Times (HH:MM:SS, HH:MM, HH)
 Default Start Time - Beginning of Run Time Log
 Default End Time - End of Run Time Log

Begin Report Time - : : : : : : : : : :
 End Report Time - : : : : : : : : : :

Exhibit 634.6, Sample Status Report

information must be entered into the workstation. The configuration menu is found on the maintenance menu. All configuration menu options are executed off-line, i.e., while the chain is stopped. Following is a sample change configuration menu:

Configuration Menu

- Change Passwords
- Set Alarm Priorities
- Set Bin Configuration Parameters
- Set Keyboard Configuration Parameters
- Display Reasons for Reject
- Set Sort Plan Defaults and Page Length
- Set System Parameters

643.2 Change Passwords. The system password is required to access this menu. Once entered, this program allows any of the passwords to be changed.

643.3 Set Alarm Priorities. This program displays the master list from the "ALARM.DAT" file of all SPBS run time fault (RTF) messages, in addition to error numbers and rankings. The ranking specifies which output device is used to display the RTF when the PC is on line. All

on-line RTFs are saved to the file "Faults.Log." Priority rankings can be changed using this program. The fault messages cannot be changed.

643.4 Set Bin Configuration Parameters. This program designates the bin destinations used for sorting SPBS mailpieces. The bin configuration must correlate directly to the sort plan loaded. The SPBS can accommodate up to 100 physical bins. Enabled bins are indicated by a Y; disabled bins by an N. See Exhibit 643.4 for a sample set bin configuration menu.

643.5 Set Keyboard Configuration Parameters. This program sets the values of the operator keyboard for use with the SPBS system. It configures the enter (ENT), repeat (REP) cancel (CAN), reject (REJ) keys, and function keys. See Exhibit 643.5 for a sample set keyboard configuration menu.

643.6 Display Reason for Reject. This program displays the master file "REJECT.DAT," which gives a list of reasons for mail to be sorted to the reject bin. The list cannot be changed. The reason for reject description is displayed on the system reject report. This program can only be executed off-line. To execute:

BIN CONFIGURATION												
Use "↑", "↓", "→", and "←", to move - ESC to Exit												
Physical Bins: 16 Enabled Bins: 13	0	1	2	3	4	5	6	7	8	9	0	10
	1	Y	N	Y	Y	Y	N	Y	Y	Y	Y	20
	2	Y	N	Y	Y	Y	Y					30
	3											40
	4											50
	5											60
	6											70
	7											80
	8											90
	9											100
	10											110

Exhibit 643.4, Sample Set Bin Configuration Menu

KEYBOARD CONFIGURATION												
Use "↑", "↓", "→", and "←", to move - ESC to Exit												
T 3	F4	7	8	9	T 2							
	F1	4	5	6								
	F2	1	2	3								
T 4	F3	0			T 1							
Push RET to accept - ESC to exit												
						T1 = REJ	CNC	ENT	REP	NUL		
						T2 = REJ	CNC	ENT	REP	NUL		
						T3 = REJ	CNC	ENT	REP	NUL		
						T4 = REJ	CNC	ENT	REP	NUL		
						F1 = A						
						F2 = B						
						F3 = C						
						F4 = D						

Exhibit 643.5, Sample Set Keyboard Configuration Menu

- a. Ensure that the configuration menu appears on the screen.
- b. Select the "display reason for reject" option.
- c. The reason for reject menu appears on the screen.
- d. Press (ESC). The configuration menu is displayed.

See Exhibit 643.6 for a sample reason for reject screen.

643.7 Set Sort Plan Default and Page Length.

This program sets the system defaults for sort plans and the page length. The active default sort plan is that which was last downloaded to the MPC upon initial configuration and/or SPBS start-up. If another sort plan was downloaded and run, this then becomes the system's active default sort plan. Do not change active sort plan default parameter while in use. Do not change the sort plan default name in the parameter until all pertinent reports have been gathered. SPBS report generation depends on this file to supply the name of the sort plan for the report being generated. See Exhibit 643.7 for a sample sort plan defaults and page length screen.

643.8 SPBS System Parameters. This program provides the capabilities for setting up certain SPBS default values. In addition to the configuration item, it lists an allowable range for each and the present value. See Exhibit 643.8 for a sample SPBS system parameters menu.

644 Diagnostics Menu

644.1 General. The diagnostics menu is found on the maintenance menu and is password protected. All diagnostics menu options are executed off-line while the carrier cell is stopped. Following is a sample diagnostics menu:

Diagnostics Menu

```

Check Lights
Exit to DOS
Shell to DOS
Module Configuration
Port Configuration
Start Diagnostics
  
```

644.2 User Access. To display the maintenance menu on the screen:

- a. Highlight the administrator menu and press (CR).
- b. Enter a valid password and press (CR).
- c. Highlight the diagnostics menu option and press (CR). The menu is displayed.
- d. Use the (ESC) key to return to the previous menu level, if necessary.

644.3 Check Lights. This program verifies the operation of lamps on the SPBS system. A faulty bulb can be observed at this time.

644.4 Exit to DOS. This program provides a permanent exit from the system manager software to the workstation operating system, MS-DOS. Once selected, DOS command can be entered. To re-enter the system manager at the supervisor menu, enter (SPBS) and press (CR).

644.5 Shell to DOS. This program provides a temporary leave from the system manager. You can access MS-DOS while not fully exiting the system manager. To return to the system manager at the diagnostic menu, enter exit and press the return or enter key.

644.6 Module Configuration. This program sets up the configuration of the SPBS sortation line per module in sequential order from the induction station receiver module to the waterfall. This is normally established during initial setup and should not be changed unless the size of the system is decreased or expanded.

644.7 Port Configuration. This program establishes the configuration of the fiber optic interfaces from the MPC to each induction and section controller. These parameters are set upon installation of the system and should not be changed unless the MPC loses contact with one of the boards or a major failure occurs in a specific section. The configuration is determined by des-

REASON FOR REJECT Push ESC to exit
<ul style="list-style-type: none"> 1 - Assigned To Reject 2 - Bin Over Weight 3 - Bin Being Swept 4 - System Overload: >20 bundles 5 - Not Assigned To Reject 6 - Driver Board Failed 7 - Carr. Cell Motor Over Current 8 - Emergency Stop/Power Failure 9 - Missent Bin = Reject Bin 10 - Bin Not Enable 11 - Not Used 12 - Not Used 13 - Not Used 14 - Not Used 15 - Not Used

Exhibit 643.6, Sample Reason for Reject Screen

SORT PLAN DEFAULTS AND PAGE LENGTH Push RETURN to accept – ESC to exit																								
<table style="width: 100%; border: none;"> <tr> <td style="width: 70%;">Length of Printer Page (lines)</td> <td style="width: 10%;">(48/78)</td> <td style="width: 10%;">:</td> <td style="width: 10%;">62</td> </tr> <tr> <td>INPUT Default Sort Plan</td> <td>(.IN)</td> <td>:</td> <td></td> </tr> <tr> <td>OUTPUT Default Sort Plan</td> <td>(.OU)</td> <td>:</td> <td></td> </tr> <tr> <td>MIX Default Sort Plan</td> <td>(.MI)</td> <td>:</td> <td></td> </tr> <tr> <td>TEST Default Sort Plan</td> <td>(.TE)</td> <td>:</td> <td></td> </tr> <tr> <td>ACTIVE Default Sort Plan</td> <td></td> <td>:</td> <td>BBM.ou</td> </tr> </table>	Length of Printer Page (lines)	(48/78)	:	62	INPUT Default Sort Plan	(.IN)	:		OUTPUT Default Sort Plan	(.OU)	:		MIX Default Sort Plan	(.MI)	:		TEST Default Sort Plan	(.TE)	:		ACTIVE Default Sort Plan		:	BBM.ou
Length of Printer Page (lines)	(48/78)	:	62																					
INPUT Default Sort Plan	(.IN)	:																						
OUTPUT Default Sort Plan	(.OU)	:																						
MIX Default Sort Plan	(.MI)	:																						
TEST Default Sort Plan	(.TE)	:																						
ACTIVE Default Sort Plan		:	BBM.ou																					

Exhibit 643.7, Sample Sort Plan Defaults and Page Length Screen

SPBS SYSTEM PARAMETERS		
Push RETURN to accept – ESC to exit		
1 - Maximum Parcel Weight (lbs.)	(1/20) :	20
2 - Maximum Parcel Length (inches)	(5/19) :	19
3 - Display KEY CODE	(Y/N) :	Y
4 - Number of Beeps for ALARM Errors	(1/5) :	1
5 - Time of Each ALARM Beep (msec)	(50/1000) :	50
6 - Number of Beeps for VALID Keys	(1/5) :	1
7 - Time of Each VALID Key Beep (msec)	(50/1000) :	50
8 - Number of Beeps for INVALID Mail Piece	(1/5) :	1
9 - Time of Each INVALID Mail Piece BEEP (msec)	(50/1000) :	50

Exhibit 643.8, Sample SPBS System Parameters Menu

ignation of the side of the induction station (right/left) and by the maximum number of carrier cells.

644.8 Start Diagnostics. This program performs diagnostics for the induction stations and section controller serial ports and the MPC. All passes and failures (reject) are listed on the diagnostics results menu. Failures and unused units are highlighted in red. The "Auto/Maint/Jog" keyswitch on the power cabinet must be set to the "Maint" position when performing diagnostics.

645 Send Configuration to Master

This program is used to send the configuration to the master processor controller. If the bin configuration is changed, it recompiles and sends the new sort plan.

646 Prepare for Final Shutdown

This program is used during turnoff procedures after the chain stop button on the rear of the power cabinet is pressed. It disengages all batteries on the master processor controller and the

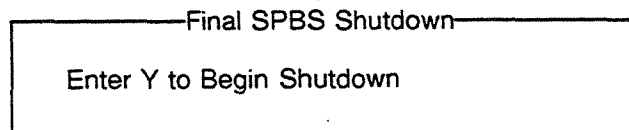
induction and section controller boards. To execute:

- a. Ensure that the maintenance menu appears on the screen.
- b. Select the "prepare for final shutdown" option.
- c. A window displaying the message "Enter Y to Being Shutdown" appears.

Note: If Y and (CR) are entered, the message "Preparation for Final Shutdown Started" is displayed. If shutdown is not permitted at this time, the message "Preparation for Shutdown Not Started" is displayed. If N and (CR) are entered, the message "Shutdown Preparation Aborted by User" is displayed.

- d. Press (ESC).
- e. The maintenance menu is displayed.

Following is a sample final SPBS shutdown menu:



Chapter 7

Safety

710 Introduction

Safety is the responsibility of every individual in the U.S. Postal Service. It is imperative that every employee understand and observe all of the USPS safety standards and procedures.

720 Supervisor Responsibilities

The supervisor has overall responsibility for the safety of the personnel involved with the equipment during its operation. The responsibility includes, but is not limited to, the following:

- a. Enforcing all current safety rules and regulations and local policies to ensure the use of safe operating procedures.
- b. Observing employees and immediately correcting any unsafe acts, practices, operational errors, or poor work habits.
- c. Ensuring that all personnel are aware of safe and proper use, maintenance, and protection of Postal Service equipment.
- d. Investigating all accidents occurring within the area of responsibility to determine the cause and corrective action to be taken.
- e. Ensuring that the equipment is not operated by personnel without proper authority or training.
- f. Ensuring that all safety guards, interlock switches, and other safety devices are operable and being used when the equipment is processing mail. At no time will any safety guard or interlock switch be disabled for any reason.
- g. Maintaining a clean and safe work area by enforcing good housekeeping practices.
- h. Using the proper method of summoning medical aid in case of an emergency.

730 Employees Responsibilities

All employees are responsible for protecting themselves, their fellow employees, the mail, and U.S. Postal Service equipment and property. This can only be accomplished when each individual understands and observes proper safety standards

and procedures at all times. Following are some of the common sense safety precautions that must be observed by all personnel when working on or around mechanical, electrical, and electronic equipment:

- a. Know how to summon medical aid in case of an emergency.
- b. Never use toxic or flammable solvents for cleaning purposes.
- c. Do not operate equipment without proper authority or proper training.
- d. Always use safety devices and safety guards properly.
- e. In the event of an electrical fire, always use a halon-type extinguisher. Never use a dry chemical extinguisher, as it may destroy the equipment. Never use water, soda-acid, or any other liquid stream extinguisher because they present a shock hazard to the user and will cause considerable damage to the electrical equipment.
- f. Never attempt making adjustments to the equipment or reach into the enclosures on the equipment unless you are a qualified maintenance person with the necessary training and qualifications to work in this area.
- g. Notify your supervisor immediately if you observe an unsafe condition or someone using an unsafe practice so that prompt corrective action can be taken.

740 Maintenance Responsibilities

Personnel working on this equipment must understand and apply safety precautions in all phases of maintenance.

- a. Maintenance personnel are responsible for performing maintenance assignments in a manner such as not to endanger themselves or others.
- b. Maintenance personnel must support efforts to properly maintain effective safeguards and protective devices on this equipment.

750 Operational Safety Summary

It is the responsibility of each individual operating this equipment to understand and observe established safety standards and procedures. Also adhere to the following:

a. Employees must not wear loose-fitting clothing, jewelry, ties, or other articles that could become caught in the machine.

b. Keep hair away from the equipment to avoid its becoming entangled in the machine.

c. Keep fingers, hands, and arms clear of moving parts when the equipment is in operation.

d. Always engage emergency stop switch before clearing any debris from the transport units.

e. Make certain that all personnel are clear of moving parts before starting equipment.

f. Know the location and use of all emergency stop switches on the equipment.

g. Do not place extraneous items (personal or other) on the equipment.

h. Always engage any of the emergency stop switches if a system failure occurs. If failure pertains only to an induction station, press the call maintenance switch.

i. Keep all access doors closed during mail-processing operations unless maintenance personnel are making observations.

j. No eating, drinking, or smoking is permitted in the work area even if the equipment is not in operation.

k. No employee will be permitted to use any type of portable listening devices (i.e., "Walk Man" radios) in the equipment area.

l. Keep aisles and work areas neat and clear of all extraneous materials (i.e., empty trays, string, rubber bands, paper, or labels).

m. Always be alert when the start-up alarm sounds.

n. Do not participate in horseplay or other inappropriate behavior.

Appendix A List of Exhibits

Exhibit Number	Title
Chapter 1	
120	Typical SPBS Configurations
Chapter 2	
221	SPBS System
223.2	Power Cabinet Front Panel
223.3	Power Cabinet Rear Panel
225.1	Induction Station
225.43	Operator Keyboard
226.1	Sort Distribution System
227.1	Sort System Output
Chapter 6	
611	System Manager Menu Tree
623.1	Sample Forecasting Rate Report
623.2	Sample History Report
623.3	Sample Induction Station Production Rate Report
623.4	Sample Production Rate Report
633.23	Sample Destination Report
633.242	Sample End-of-Run Report
633.25	Sample System Full Report
633.26	Sample Key Code Per Induction Station Report
633.27	Sample System Key Code Report
633.28	Sample System Reject Report
633.29	Sample System Summary Report
633.33	Sample System Failure Report
633.34	Sample System Log Report
633.533	Sample Sort Plan Configuration
633.534	Sample Bin Configuration/Compilation Menu (and Valid Container Types Screen)
634.6	Sample Status Report
643.4	Sample Set Bin Configuration Screen
643.5	Sample Set Keyboard Configuration Screen
643.6	Sample Reason for Reject Screen
643.7	Sample Sort Plan Defaults and Page Length Screen
643.8	Sample SPBS System Parameters Menu

Appendix B List of Acronyms and Abbreviations

BOL	Beam of light
CPU	Central processing unit
HD	High density
IC	Induction controller
IS	Induction station
ISC	Induction station controller
IPP	Irregular parcel post
MPC	Master process controller
MS-DOS	Microsoft disk operating system
PCB	Printed circuit board
PWA	Printed wiring assembly
P/W2	Unisys workstation
PC	Personal computer
SC	Section controller
SPBS	Small parcel bundle sorter

Appendix C

Glossary of Terms

"A" Module

Part of the sort distribution system. Connects to and controls sort points of "B" module.

Aux Module

Part of the sort distribution system. Allows for system configuration flexibility and is controlled by the "C" module.

"B" Module

Part of the sort distribution system. Connects to and is controlled by an "A" module.

Beam of Light (BOL)

Optical mailpiece detectors located in the induction and sort distribution area. SPBS uses three types: retro-reflective, thru-scan, and retro-scan.

Buffer Conveyor

Located between the weigh and 45-degree conveyors, it contains an array of BOLs used to determine the length, width, and height of a mailpiece. Synchronizes the induction line with the main transport.

Bundle Bump

Ejection of a mailpiece into an output bin.

"C" Module

Part of the sort distribution system output section. Connects to the drive end module and controls the reject bin and chain motor speed. Also controls the aux module.

Carrier Cell

Transporting unit that accepts a mailpiece from the 45-degree conveyor and transports it to a destination bin. Each carrier cell contains a bi-directional conveyor belt to eject the mail into the output chute.

Conveyor

First conveyor of induction line after the inclined conveyor where operator codes information for bundle sorting based on ZIP Code data.

Control Arm

An assembly located in the sort distribution area that contains the bin reset button, emergency stop switch, dispatch labels, and retainer latch release. Indicates that a bin has been swept.

Cullers

Postal personnel who manually remove irregular parcels and mailpieces, non-machineable third and fourth class items, such as sackable rolls and tubes, small cubes, small fragile parcels, sackable films, paper or sleeve wrapped catalogs, and non-caseable flats from the culling belt. At the same time this mail will be separated by the cullers onto a conveyor to the SPBS induction station or 1046/1047 hampers for further handling. The culler maintains the integrity of machineable bundles and if necessary, re-bands non-machineable bundles into machineable bundles.

Drive End Module

Contains the chain motor located at the opposite end of the takeup module.

Dumper

Postal personnel who receive mail in sacks, pouches, hampers, or BMC containers and dump this mail onto a culling belt.

Emergency Stop Switch

A switch and indicator light assembly located along the sort distribution system area. An emergency stop switch is also contained on the operator control box. When pressed, power to all induction lines is removed.

Fiber Optic Interface

Cable interface used for induction or section CPU communications from the MPC to all other CPUs.

Footprint

Length and width of a mailpiece as determined by the BOLs of the buffer module.

45-Degree Conveyor

Used to transfer mailpieces from the induction line to the receiver module of the sort distribution system.

Hatchment Covers

"Skin" of the SPBS. Opening the hatchment cover creates an emergency stop condition.

Interlock Switches

Contains two micro switches and is located behind each hatchment cover and overflow chamber. Removal of a hatchment sends an emergency stop message to the workstation monitor.

Inclined Conveyor (I.C.)

Transports mailpieces to the keying operator coding station.

Induction Controller

An induction CPU that controls the mailpiece flow through the induction line onto the sort distribution receiver modules.

Induction Station (I.S.)

Area where operator codes packages and assigns bin destination. Consists of operator control panel, display, and keyboard.

Irregularity (anomaly)

Abnormal machine function or irregular mailpieces resulting in audio/visual display indications or machine shutdown.

Master Processor Controller (MPC)

Controls SPBS system operation. Responsible for cell movement, status, control and reporting, and output destination bin assignment.

MS-DOS

Micro-soft disk operating system software used in the supervisor computer workstation.

Operator Control Box

Serves as induction control interface to MPC and IC. Contains four switches (reset, call for maintenance, on/off key, and emergency stop).

Operator Display

Audio/visual display for operator instruction.

Operator Keyboard

Keypad used for entering a mailpiece keycode based on sort program.

Overflow Chamber (waterfall)

Receives any mail not ejected along the sort distribution path or to the reject bin.

Power Cabinet

Distributes AC power to the system and is located next to the computer workstation.

Proximity Sensors

Located in the takeup module. Used to keep track of the position of the carrier cells.

Reject Bin

Mailchute used for rejected mail located near the drive end module.

Receiver/Recentering Module

Activates carrier cell conveyor to accept and re-center mailpiece from 45-degree conveyor.

Section Controller

Monitors the flow of a mailpiece through its sort distribution line and provides control for mailpiece ejection.

Sort Points/Pairs

Output chute for mail. SPBS has discharge capability for either side of the machine known as a sort pair. Two sort points equal one sort pair.

Sweeper

Postal personnel responsible for emptying output bins when full.

System Manager

Specialized hardware and software that allows USPS personnel to interface with the SPBS. Generates sort programs, runs reports, and controls maintenance diagnostics and tests.

Takeup Module

Contains the MPC and is located at the opposite end from the drive end.

Transport Chain

Transports the carrier cells through the sort distribution system.

Turn-End Module

Optional curved units that allow the SPBS to be configured in either a right or left "L" shape. Two turn modules can be used to form a "U" shape.

Type 89 Conveyor

Accepts incoming mail for processing and deposits it in the hamper of the SPBS inclined conveyor.

Throw Off Container

Used by operator to deposit mail deemed unacceptable for mail processing on the SPBS.

Weigh Conveyor

Conveyor that weighs mailpiece and is located between coding and buffer modules.

Wiretainer

A "wire container" output receptacle that receives sorted bundles. It is similar in size to a 1046 hamper.